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ENVIRONMENTAL THREATS AND OPPORTUNITIES ASSESSMENT (ETOA) FOR RUSSIA

PROSPERITY, LIVELIHOODS AND CONSERVING
ECOSYSTEMS (PLACE) IQC
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ACRONYMS

The following list is provided for ease of reference by the readers of this document. Although the authors made every effort to reduce the number of acronyms in this text, some were necessary. When the acronym or abbreviation appears the first time it is defined in the text. If the acronym only appears with its definition, it is not included here.

APEC	Asia Pacific Economic Council
BPC	Bilateral Presidential Commission
CDSP	Community Development Support Program
DGP	Development Grant Program
EE	Energy Efficiency
EMS	Environmental Management System
ERU	Emission Reduction Unit
ESCO	Energy Service Company
ETOA	Environmental Threats and Opportunities Assessment
EU	European Union
FAO	Food and Agriculture Organization (of the United Nations)
FLEG	Forest Law Enforcement and Governance
GCC	Global Climate Change
GIS	Green Investment Scheme
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas(es)
IPCC	International Panel on Climate Change
IUCN	International Union for the Conservation of Nature
ISO	International Organization for Standardization
JI	Joint Implementation
MED	Ministry of Economic Development
MNR	Ministry of Natural Resources
MNRE	Ministry of Natural Resources and Environment
ND	Northern Dimension
NDEP	Northern Dimension Environmental Partnership
NGO	Non-Governmental Organization

NOAA	National Oceanographic and Aeronautical Agency
NTFP	Non-Timber Forest Product
PA	Protected Area
PEL	Past environmental liability
RF	Russian Federation
RFE	Russia Far East
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USAID	United States Agency for International Development
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

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BACKGROUND

INTRODUCTION

This **Environmental Threats and Opportunities Assessment** (ETOA) comes at an opportune moment in the “reset” of relations between the United States and the Russian Federation (often referred to as Russia in this report). On July 6, 2009, Presidents Obama and Medvedev initiated a **Bilateral Presidential Commission** (BPC) to facilitate dialogues on matters of common concern. The BPC is co-chaired by the presidents and coordinated by the United States (US) Secretary of State and the Russian Foreign Minister. It has 16 Working Groups, including groups for Energy and for Environment. Other Working Groups that are relevant to this assessment are: Agriculture, Science and Technology; Health, Emergency Situations, and Education; and Culture, Sports and Media.

The following excerpts from the BPC Joint Report (BPC 2010) provide useful context for the ETOA: *“Working Groups on **Energy** and **Science and Technology** have...advance[d] cooperation on energy efficiency, the development of low carbon fuels and climate science... New pilot projects in cutting-edge “smart grid” technology will help stimulate economic growth as well as help us address climate change... Under the auspices of the **Environment** and **Agriculture** Working Groups, we are collaborating on environmental issues in the Arctic and supporting tiger, polar bear and other wildlife conservation efforts. We are also cooperating on water quality and hazardous sites clean-up. Building on more than 50 years of cooperation, our forest agencies have also enhanced efforts to sustainably manage forests and prevent illegal logging.”*

In assessing threats and opportunities, the ETOA uses a broad definition of **environment** that includes issues such as: air and water pollution; management of municipal, industrial and hazardous wastes; past environmental liabilities; natural resources management issues; land, water, forests, freshwater and marine fisheries, biodiversity and protected areas; as well as the emerging issues of Global Climate Change (GCC). However, not all issues are treated equally; more emphasis is given to those areas where the United States Agency for International Development (USAID) has been active (especially natural resources management) or could be active in the next few years (particularly GCC). The legacy of past environmental neglect in Russia is already large and severely impacting human health, the economy and ecosystems. GCC is now beginning to add a new set of issues to an already crowded agenda and, in some cases, adding urgency to old problems.

The ETOA is framed in the transition of USAID’s Russia program from one of assistance to a model of partnership, and defines the implications for priority issues in environment. The ECODIT Team is also conscious that USAID support is likely to remain modest over the coming years. It has therefore looked for interventions which are **catalytic** and can leverage substantial Russian resources and have a multiplier effect.

OBJECTIVES OF THE ASSESSMENT

According to the Statement of Work for the ETOA (Annex D), the assessment is being undertaken to better inform the new USAID/Russia Mission Strategy, to identify possible new interventions, and ensure that environmental issues and priorities are incorporated where needed and practical. The ETOA objective is two-fold:

- (1) To conduct a country-wide assessment of environmental issues in Russia, with particular emphasis on those related to the Mission's potential work on Climate Change:
 - Reducing Greenhouse Gases (GHG) emissions through increasing energy efficiency and energy savings;
 - Assessment of adaptation measures: improved management of freshwater resources;
 - Role of forests in GCC.
- Additionally, emphasis will be on GCC programs that can be expected to enhance cooperation between US and Russian organizations and government institutions; and
- (2) To update the country biodiversity analysis that was completed in 2005 in response to the requirements of Section 119(d) of the Foreign Assistance Act (FAA) of 1961 (as amended) and ADS 201.3.9.2 (rev 2008)(see Attachment 2 of Part II).

METHODOLOGY

In making this assessment, the ECODIT Team has taken the following steps:

- Review of documents from numerous sources.
- Discussions in Washington with relevant US Government agencies, the World Bank, the Global Environment Facility (GEF), and international NGOs, and a conference call with the Contracting Officer's Technical Representative (Mr. Randolph Flay).
- Discussions in Moscow with the US Embassy, USAID Mission (Director, Mr. Charles North and staff), Russian federal ministries and agencies, technical institutes; international and local NGOs.
- Discussions and site visits in four regions of interest to USAID (Irkutsk, Buryatiya, Khabarovsk and Primorye), including: discussions with regional ministries and agencies, technical institutes, NGOs and private sector firms, and visits to sites of ongoing USAID projects and key protected areas.
- A visit by one team member to St. Petersburg to meet with technical institutes.
- Wrap-up discussions in Moscow with the USAID Mission and one federal agency.
- Report writing.

A full list of places visited and persons with whom the Team met is shown in Annex C.

The ETOA Report is divided into two parts corresponding to the two objectives of the ETOA: Part I is the country-wide assessment of environmental issues and ends with a set of proposals for consideration by USAID Russia for the forthcoming mission strategy (Chapter 6): Part II is the country biodiversity analysis in accordance with Section 119(d) of the FAA.

PART I
ENVIRONMENTAL ISSUES IN RUSSIA AND
OPPORTUNITIES FOR USAID

EXECUTIVE SUMMARY

The Russian Federation faces numerous environmental threats, with **global climate change** being at the forefront. Scientific evidence suggests that, over the last 100 years, warming in Russia is almost double that of overall global warming (1.29°C versus 0.74°C). This is likely to produce many effects, including an extended growing season for crops and reduced heating cost, as well as extreme weather events – such as hurricanes, floods, droughts, and fire risks in forests – melting of the permafrost (which has already had substantial negative impacts on infrastructure) and possible extinction of species like polar bears due to melting polar ice. Russia is the third largest emitter – after China and the US – of CO₂ from the energy sector, and the country could save up to 45 percent of its total primary energy consumption if it were to implement a comprehensive reform program. In fact, Russia has more options for reducing emissions with only modest expenditures in the near future than any other developed country. Russia is now playing an active role in mitigating greenhouse gas emissions and developing strategies for adapting to climate change.

Several other environmental threats have been impacting human health, the economy and the natural environment for decades. Average annual levels of **air pollution** exceed safe levels in hundreds of cities, due to an increase in pollution-intensive sectors, and **water quality** and aquatic ecosystem status are unsatisfactory in the most populated and industrialized regions. Industrial **waste generation** and **waste disposal** problems are acute and widespread. The **marine environment** is under threat along many parts of Russia's enormous coastline due to petroleum, mining, shipping, and oil development, as well as new risks from climate change. Russia's forests are one of the four remaining mega-areas of intact forests in the world and are important areas for biodiversity conservation, local livelihoods and economic development; however, **illegal and unsustainable timber harvesting** continues to threaten Russia's forests. Fisheries habitats are extensive and varied in Russia, and certain fish species are under threat from **over-harvesting**, including salmon; of 13 species and sub-species of salmon, nine are considered endangered.

The present unsustainable state of the environment in Russia owes much to the **priorities of the Soviet period**: resource extraction, heavy industry and the military. Prices were set arbitrarily and played little part in resource allocation, particularly so with energy, leading to **excessive energy consumption and over-reliance on dirty fuels such as coal**. Public awareness of the costs of environmental degradation was, and remains, limited. And these costs are quite high: every year, Russia's gross domestic product (GDP) is reduced by *four to six percent* due to illnesses linked to air and water pollution. Breathing polluted air cuts Russians' average life expectancy by *about one year* and, in the most polluted cities, *up to four years*; air pollution is directly responsible for up to *eight percent* of overall annual mortality.

Over the past ten years, **environmental management systems** in Russia have been progressively weakened, although there are recent signs that this trend is being reversed. Russia has an **extensive system of environmental monitoring**, although there are some important gaps, such as the very limited monitoring of fine particulates, which are one of the main causes of human illness from air pollution. The current Russian environmental legislative framework consists of a large volume of legislation. Most of it is largely declaratory in nature and, moreover, **economic incentives to enhance environmental performance** are hardly used. NGOs remain vocal critics of the progressive weakening of environmental management and the lack of follow through on top level directives for reform; however, they are in increasing danger of repressive actions from the government.

Taking into account the above threats and conditions in Russia, in addition to the maturation of USAID’s relationship with Russia to one of partnership, the Assessment Team has identified a few **priority areas for USAID consideration** under two scenarios: base case (funding level of \$2 million per year) and enhanced (additional funding for climate change). These areas were identified based on their capacity to catalyze other funding, their impact on natural resources conservation, and their ability to build on past success.

TABLE 6.1 PRIMARY RECOMMENDATIONS/PROGRAM OPPORTUNITIES

BASE CASE SCENARIO		ENHANCED CASE SCENARIO
ENVIRONMENT OBJECTIVE	CIVIL SOCIETY OBJECTIVE	ENVIRONMENT OBJECTIVE
1. Sustainable Natural Resource Management (USFS program)	4. Empowerment of Local Institutions 5. NGOs as Change Agents	6. Developing Capacity in Global Climate Change
2. Protected Area Management and Rural Livelihoods		
3. Collaborating to Meet the Challenge of Global Climate Change		

Opportunity 1. We endorse continuation of the US Forest Service program support to Russia’s forestry sector, with a few modifications. Sustainable forest management in Russia is essential to protect biodiversity, and forests also play an important role in the mitigation of climate change, now and perhaps even more so in the future.

Opportunity 2. We suggest that USAID support Russia in modernizing protected areas policies and introducing more effective management practices, reflecting international experience. This could include reviewing the protected areas system design, developing viable management zones, and improving local livelihoods through strategic tourism development.

Opportunity 3. As one of the first priorities for the new era of partnership, we propose that USAID support horizontal collaboration on climate change awareness-raising between US and Russian institutions, communities and individuals through programs such as Linking People for Awareness Raising and a Climate Change Clearing House on mitigation and adaptation.

Opportunity 4. We suggest that USAID strengthen local governments and other local institutions through participatory planning and implementation of small investment projects with economic and environmental benefits. It could follow an implementation model similar to the completed Community Development Support Program but with greater emphasis on economic/financial payoffs, important because of the bankrupt status of many of the municipalities, as well as environmental and climate change benefits.

Opportunity 5. We propose that USAID foster a community of self-reliant, sustainable NGOs and develop their capacity in promoting public awareness through two components: 1) a national environment and climate change awareness program, and 2) assistance to NGOs to increase their membership bases and financial stability.

Opportunity 6 (Enhanced Case Scenario). We suggest expanding support on climate change to include building capacity for mitigation and adaptation.

The Assessment Team also presents other ideas for consideration in the future or if obstacles block the proposals above, including: environmental management in and around Lake Baikal; black carbon; the melting of the permafrost; and coal bed and coal mine methane.

1.0 THE RUSSIAN FEDERATION AND CLIMATE CHANGE

Russia faces significant threats from global climate change (GCC), with a number of the most serious risks already evident. Indications are that warming in Russia was 1.29°C as compared to global warming of 0.74°C for the last 100 years¹ (IPCC, 2008). Of all European and Asian countries, Russia appears most exposed to increased climate extremes, according to an index designed to capture the strength of future climate change relative to today's natural variability (World Bank, 2009a). This does not necessarily translate into public concern for climate change, however; only 40 percent of Russians think climate change is a serious issue. It follows that objective media coverage of climate change and its implications, including 'popular science' approaches to climate awareness, is one of the priority issues for Russia (World Bank, 2009b).

Adoption of the Climate Doctrine of the Russian Federation on November 17, 2009, was an important step forward in addressing GCC threats. The doctrine sets out the goals, principles, content and means of implementation of a unified climate change policy in the country. The strategic goal of Russia's climate change policy is to ensure safe and sustainable institutional, economic, environmental and social (including demographic) development, in the context of climate change threats and challenges. Implementing the doctrine involves carrying out state programs to reduce the anthropogenic impacts on the atmosphere and accelerate the country's adaptation to climate and related changes taking place in the world, including those in the Arctic. The doctrine pays special attention to development of Russian climate science, which many prominent experts believe to be in need of strong state support (Climate Doctrine, 2009).

Russia's Security Council, at its meeting of March 17, 2010 examined the range of issues related to environmental, economic and social consequences of global climate change and clearly stated that GCC – including timely evaluation and appropriate response – needs to be one of Russia's national priorities. Successful development and implementation of Russia's climate change policy will depend on greater environmental awareness and understanding of climate change issues among government officials, business people, civil society and the general public. Russia's vulnerability to GCC over the next ten to 20 years will be dominated by socio-economic factors and legacy issues, notably the dire current environmental situation (see Chapters 2 and 3) and the poor state of infrastructure (World Bank, 2009).

Given the importance of GCC impacts for Russia and growing evidence that the government is seriously addressing them, the Team placed climate change at the center of this assessment.

1.1 GREENHOUSE GAS EMISSIONS AND PARTICIPATION IN NEGOTIATIONS ON NEW AGREEMENTS

Russia is the third largest emitter – after China and the US – of CO₂ from the energy sector. Aggregate greenhouse gas (GHG) emissions in the energy, industrial and agricultural sectors amounted to 2.2 billion tons of CO₂ equivalent in 2008. This level is significantly lower (32.9 percent) than emissions in 1990, as emissions decreased 40 percent from 1990 to 1998 following the dramatic contraction of the economy. From 1999 to 2007, however, emissions grew by 10 percent, with a subsequent eight percent decline in emissions during the global recession (Korppoo et al, 2010). Distribution of emissions by sectors has not changed significantly for the period 1990-2008, and the energy sector continues to emit the most carbon dioxide – about 82 percent of the total (National Inventory, 2010).

¹ 1907–2006.

In early 2010, the Fifth National Communication of the Russian Federation prepared and submitted in accordance with the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol, proposed three scenarios of anthropogenic emissions of GHG in Russia until 2030 (illustrated in Table 1):

1. **Moderate** – this is based on the pre-crisis rate of economic development and energy efficiency improvement. This scenario is more likely if economic growth is rapid.
2. **Innovative** – this makes an assumption that energy efficiency improvements will be widely implemented. The energy intensity will be reduced, due to the acceleration of energy-saving innovations and the alignment of prices, as well as structural shifts in the economy.
3. **Additional Measures** – this also includes the realization of a deliberate policy to limit and reduce GHG emissions. Included in the policy may be both market and non-market measures to reduce emissions; for instance, the introduction of emissions prices by organizing a system of emissions trading (Fifth National Communication, 2010).

TABLE I. PROJECTED CHANGES IN ANTHROPOGENIC EMISSIONS IN RUSSIA

1. MODERATE SCENARIO		2005	2007	2010	2015	2020	2030
Total	Billion tons CO ₂ -equiv.	1.73	1.79	1.63	1.87	2.24	2.90
	% of 1990 level	64.0	66.0	60.2	69.1	82.9	107.5
2. INNOVATIVE SCENARIO							
Total	Billion tons CO ₂ -equiv.	1.73	1.79	1.63	1.69	2.00	2.39
	% of 1990 level	64.0	66.0	60.1	62.3	74.0	88.4
3. ADDITIONAL MEASURES							
Total	Billion tons CO ₂ -equiv.	1.73	1.79	1.63	1.66	1.95	2.29
	% of 1990 level	64.0	66.0	60.1	61.4	72.2	84.9

One of the most important potential sources for carbon emissions reduction is energy efficiency improvement. According to recent estimates by the World Bank/International Finance Corporation (IFC) and the Russian Center for Energy Efficiency, Russia could save up to 45 percent of its total primary energy consumption if it were to implement a comprehensive energy reform program (WB/IFC, 2008). Russia's official target set by the President in June 2008 is a 40 percent reduction of Gross Domestic Product (GDP) energy intensity by 2020. In total, Russia could achieve savings equivalent to all the net imports of energy of France or the United Kingdom, bringing the Russian economy \$120-150 billion in energy cost savings and increased gas exports annually. Given the magnitude of the task at hand, increased energy efficiency will understandably remain the primary focus of the country's attention for a while. Section 3.5 reviews recent achievements in energy efficiency.

The important role that Russia plays in international climate politics and policies is defined by the scale of its GHG emissions and the vastness of its forests, as the worldwide community recognizes forests as carbon sinks. The Kyoto Protocol is an international environmental agreement in which Russia has a claim to global leadership: Russia's ratification of the Kyoto Protocol in 2004 enabled the agreement to take effect. Russia is successfully implementing the institutional requirements of the Protocol and is far ahead of its quantitative commitments with regard to GHG emissions in 2008–2012, for the reasons explained above (severe economic contraction).

Looking towards negotiations for a post-2012 climate regime, Russia signed the G-8 Declaration in Akvila that has a target of 80 percent emissions reductions by 2050, although Russia itself promised to reduce emissions only by 50 percent. Key features of Russia's position in the negotiations are the following:

- The Kyoto Protocol should be replaced by a new agreement based on broad participation of all developed and advanced developing countries;
- A new agreement should take into account the role Russia's forests play as the "lungs of the world", given their enormous capacity to sequester carbon;
- A new agreement should take into account the fulfillment of commitments under UNFCCC and the Kyoto Protocol;
- The carbon market is not a panacea but rather an instrument supporting countries' efforts;
- No new agreement is possible without a new classification of countries that addresses social, economic and geographic differentiation; and
- Each country's economic and geographical features should be taken into account in any new climate regime.

Russia joined the Copenhagen Accord and announced its pledge to limit GHG emissions growth to between 15 and 25 percent less than the 1990 level by 2020. The Russian delegation at the recent conference in Cancun (Mexico) added: "We realize the potential threats of global climate change for the population and economy of our country, other states and regions, and facts now say that it is our country that is leading on the issue of greenhouse gases emission reduction. Russia will keep actively participating in all processes leading to real reduction of the anthropogenic load on the climate from the side of all the countries in the world...In fact, the negotiation process is now in the transition from one legally binding document to another... the Russian Federation will not take part in the second period of the Kyoto commitments."

Of particular importance to Russia, with its vast forest resources are the accounting rules for Land-Use, Land-Use Change and Forestry. This issue is currently under discussion in the UNFCCC negotiations and focuses on setting the reference levels for forest management against which to measure annual sequestrations and emissions. Experts estimate that fair accounting for the Russian forestry sector could have a significant impact on Russia's emissions target and its potential surplus of emissions rights.

1.2 MITIGATION PROGRAMS AND THEIR EFFECT

Russia's climate change mitigation strategy depends largely on the development and implementation of a shift to an energy-efficient economy, the introduction of modern green technologies, and a reduction in GHG emissions into the atmosphere. The almost simultaneous adoption of the Climate Doctrine and the Energy Policy of Russia up to 2030² bodes well for integration of energy and climate policies with respect to action plans and socio-economic development programs. The state policy on energy efficiency is presented in section 3.5 of the report. Two case studies (Annex E, Cases 3 and 4) demonstrate some practical opportunities for energy efficiency improvements: reducing the flaring of associated gas and leakage from gas pipelines and utilizing methane from coal mining operations.

As has been the case in practically every aspect of Russian policy, the global economic crisis has had a major impact on the national energy efficiency plans and programs. On one hand, the

² Approved by Governmental Decree No.1715-r, dated November 13, 2009.

crisis affected the government's approach to energy efficiency reform. Unlike the business-as-usual approach seen in previous years, more aggressive policy measures were adopted. For example, the government's anti-crisis plan included requirements that recipients of funds from the stimulus package must have an energy efficiency plan. On the other hand, the crisis forced substantial reductions in corporate investment programs, including modernization of energy infrastructure and energy transportation networks. This is particularly true of the electricity sector – which saw a 4.5 percent drop in demand in 2009 – as well as the other sectors affected by the global decline in demand, such as metallurgy and the chemical industry.

1.3 OBSERVATIONS AND ASSESSMENTS OF LIKELY IMPACTS OF GLOBAL CLIMATE CHANGE ON RUSSIA

The Global Climate Observing System – established by the World Meteorological Organization, the United Nations Environment Programme, the Intergovernmental Oceanographic Commission of UNESCO³, and the International Council for Science – uses observational sites placed on land, ships, floating buoys, weather balloons, aircraft, and satellites to record various indicators of climate change, such as greenhouse gases, ozone, and hydrological observations on rivers, lakes, and reservoirs. In Russia, the National Hydrometeorological Service (Roshydromet) carries out basic observations of climate and – on behalf of the Russian Federation – participates in most international observational programs, such as the Global Climate Observing System (see fig GS1 in Annex F for the location of Roshydromet stations). Climate monitoring records by the national hydrometeorological network show significant impacts from climate change on Russia's natural environment and socioeconomic development.

These impacts are also noted in scientific publications by Russian and foreign scientists. According to the *Assessment Report on Climate Change and Its Consequences in the Russian Federation* (2008), climate change is expected to significantly influence the environment and socio-economic activity of different regions of the country. Most of Russia is located in the area of substantial observed and projected climate change. Due to its large size and specific inherent patterns of natural environment, climate changes can manifest regional non-uniformity. In some regions, they may be favorable; in others, they may produce negative impacts. For example, climate change will displace the zone of comfortable habitation northward, reduce heating needs, and increase the farming potential in regions with sufficient water resources. Global warming will favorably influence ice conditions in the Arctic seas, enhancing the potential for sea transportation and development projects (including petroleum) on the Arctic shelf.

On the other hand, global warming and changing ice conditions are decreasing the range of endemic Arctic species (e.g., polar bears, walruses and musk oxen) and negatively impacting native traditional lifestyles, shrinking livelihoods in addition to affecting oceanographic processes and causing sea levels to rise. The reduction of water resources is expected in the regions where their deficit is experienced now. Climate changes may increase the probability of extreme event occurrences, such as hurricanes, tornados, floods, droughts, fire risks in forests, and avalanches and mudflows in mountain regions. These will cause large negative economic and social consequences. Due to climate warming, considerable changes are also expected in natural ecosystems, such as larger ranges of some vector-borne human diseases.

Discernible shifts have already been observed in phenological attributes of plants and animals (e.g., flowering dates, seasonal migration in birds), spatial limits of vegetation zones and ecosystem structure. Much more research is needed to understand how these timing changes may affect entire ecosystems.

³ United Nations Education, Science and Cultural Organization.

The tendencies described above will continue under further warming in the 21st century, in which the boundaries of vegetation zones, including the forest zone in the European part of Russia will typically shift northward. In Siberia, the forest area may decrease, along with an increase in floristic biodiversity. Climate change will potentially cause mismatches in food availability, shifts in vegetation zones in plains and altitudinal belts in mountains, and alterations in ecosystem structure. Nature reserves and other protected areas may partly lose their nature conservation value due to such climate-driven changes.

Climatic changes over most of Russia have caused an increase in the net primary production of ecosystems (under the assumption that other, non-climatic conditions remained unchanged). At the same time, in some regions, at different latitudes, the observed values of the radial tree increment declined. The carbon content in soils increased, and under moderate warming and sufficient moistening, carbon accumulation will be possible for most soils; however, previously locked up carbon in now melting permafrost may be oxidized (Annex E, Case 2).

Desertification observed over Russia's arid lands is predominantly anthropogenic. If warming accompanied by a decrease in moisture occurs over the European part of Russia, the aridity of climate will increase in the forest steppe, steppe, and semi-desert zones. Intensive use of arid lands under changing climate may cause disastrous local desertification.

The annual maxima and minima of daily surface air temperature are predicted to increase, with the largest increase occurring in the cold season. The frost-free period will typically increase. Annual precipitation over Russia has increased (7.2 mm/10 years) over the last 30 years⁴. However, considerable differences are observed in the patterns of region precipitation changes. The most essential changes are the increase in spring precipitation (16.8 mm/10 years) in the western and northeastern regions of Siberia and in the European part of Russia. The annual runoff has increased by 15-40 percent for rivers in the western regions and tributaries on the left bank of the Volga River⁵.

In the Assessment Report (2008), projection of climate change for the 21st century in Russia and contiguous regions was further elaborated upon *vis-à-vis* the 1980-1999 period. By the middle of the century, the temperature rise will be large ($2.6 \pm 0.7^\circ\text{C}$), particularly in winter ($3.4 \pm 0.8^\circ\text{C}$). By then, winter precipitation is expected to increase all over the country and, in summer, the sign of its change will depend upon the region considered (see Figures GS7 a, b, c, d in Annex F). The largest increase in runoff will occur in watersheds of northern and Siberian rivers, and runoff will decrease in watersheds of southern rivers due to annual precipitation decrease and evaporation increase in spring and summer (see Figure GS8 in Annex F).

Climate change will have negative impacts on many parts of the national economy and the energy sector may be among the hardest hit. Energy facilities in Siberia and the northern territories are particularly vulnerable due to thawing of the permafrost, which covers two-thirds of Russia's territory. It is expected that the depth of seasonal melting will increase by 30-50 percent by 2050, which will create new technical challenges for the resource extraction industry. Communities and energy infrastructure in traditional permafrost areas are particularly at risk. In Western Siberia, 21 percent of all accidents on trunk oil and gas pipelines have mechanical causes, including failure of foundations and deformation of supports.

⁴ 1976–2006.

⁵ Over the period 1978–2005 relative to 1946–1977.

1.4 ADAPTATION PROGRAMS

President Medvedev, in his opening speech to the Security Council, indicated some key priorities related to adaptation to climate change: adjust building and technical regulations to take into account the current or forecast effects of climate change; make thorough checks of civil and military infrastructure located in regions with the most complicated climatic conditions; and build up modern scientific research and forecasting capability. He stressed that Russia is “still quite a long way behind most developed countries in monitoring and forecasting climate change...we are still unable to carry out ongoing meteorological study of the Arctic region, which is absolutely crucial for understanding the causes and consequences of climate change.” The President also regretted the lack of a clear organizational system for managing climate research. He proposed to establish a **National Center on Climate Change** and to create a research plan that includes forecasting national security threats and offering recommendations for adapting to climate change at the national, regional, and industry-specific levels.

Russian experts agree that positive and negative climate change impacts require comprehensive, professional study and that it is important to develop climate risk assessments, research on forecasting and studies of possible benefits for the energy industry and other sectors, so that long- and medium-term strategic decisions are based upon scientific data. Special attention should also be given to the development of early warning systems and techniques for prediction of extreme events leading to serious negative socio-economic and ecological consequences. High-quality performance of the national integrated climate observing system operated under Roshydromet should be the basis for successful study of climate change in the country and participation in the international cooperation efforts.

It is necessary to strengthen studies aimed at the development of technologies contributing to reduction of climate change, increase in energy saving, use of renewable energy sources, and development of carbon dioxide capture and storage technologies.

In 2008, the United Nations Development Program in Russia and the Russian Regional Environmental Centre initiated a pilot project for development of low carbon and climate-resilient territories in the Russian Arctic. Murmansk *oblast* was selected for the pilot project, in view of its high concentration of strategically important and climate-reliant economic sectors and high population density in the region compared to Russia's other Arctic territories. (More than 40 percent of the Russian Arctic population lives in Murmansk *oblast*.) This project considers possible climate change adaptation measures for the population and key economic sectors in Murmansk *oblast*. One of the study's key recommendations is that the integrated climate strategies need to become an essential element of regional socio-economic development planning in the future. Their elaboration and timely adoption is an important precondition for sustainable development of Arctic regions in the context of climate change. In addition to minimizing the negative impact of observed climate changes, these strategies can bring additional benefits for economic development, employment and health, as well as facilitating faster adoption of more sustainable, energy-efficient and low carbon technologies and practices in the Arctic economy, strengthening infrastructure and reducing prices for electricity.

Recommendations on further climate policy actions for the Russian Arctic are developed in the study. Most of the proposed short-term (to 2012) measures do not require large investments, are realistic, and can be incorporated into regional socio-economic development strategies. Larger financial investments and broader involvement at federal, regional and local levels will be required in order to implement further actions, although development of science and technology should help to reduce the costs and shorten implementation periods.

Following the decisions of the Security Council of the Russian Federation (March, 2010), the Ministry of Economic Development (MED) is now coordinating preparation of a draft **Action Plan on Implementation of the Climate Doctrine**. The action plan, to be approved by the government, includes important measures such as: creation of the National Center on Climate Change; elaboration of methodology for risk assessment, damage calculations and actions to adapt to increased severity of droughts and fires in forests and peat bogs; and other activities.

USAID has recently initiated two projects under its Global Climate Change Program⁶:

- “Climate Change Adaptation and Mitigation Strategies in the Forest Sector of the Russian Regions of the UNESCO World Heritage and Biodiversity Centers” is under implementation by a consortium led by the NGO Center for Environmental Innovations. The project aims to strengthen Russia’s climate change *adaptation* policy in the forest sector, via improved knowledge of the future condition of forests, including natural and anthropogenic impacts on forests, carbon sequestration capacity, enhanced and results-oriented policy making at both regional and federal levels, with specific focus on Siberia, Baikal and the Russian Far East.
- “Intensified and Sustainable Forest Management in Russia” is under implementation by a consortium led by the NGO Transparent World. The overall goal of this project is to enhance and sustain the positive contribution of Russia’s forest sector to the climate change agenda (both *mitigation* and *adaptation*) by stimulating and supporting more intensive forest management. Three mutually supportive objectives underpin this goal: increase professional and public awareness; identify and locate silvicultural opportunities; and, create a professional community of inter-regional and international learning.

The projects lay an important foundation in a broader US-Russia partnership to address GCC.

1.5 CARBON FINANCING

Russia has more options for reducing emissions with only modest expenditures in the near future than any other developed country. This could attract significant domestic and foreign investments in the development of the energy, metallurgy, housing, utilities, forestry and other sectors through the establishment of national procedures for approval and registration of joint implementation (JI) projects described in chapter 6 of the Kyoto Protocol. As of November 2010, over 120 joint implementation projects had been prepared that, together, have the potential to reduce emissions by over 200 metric tons of CO₂ equivalent between 2008 and 2012.

On October 28, 2009, the Russian Government adopted two new measures related to the development of JI projects in the Russian Federation:

- 1) Russian Government Resolution No. 843 “On Measures to Implement Article 6 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change” (the “Resolution”);
- 2) Regulations “On Implementation of Article 6 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change” (the “New JI Rules”).

In the opinion of experts, the new JI Rules finally complete the basis for JI projects in Russia. They grant a state-owned bank (Sberbank) important powers related to the implementation of JI projects. Sberbank participates in approval of the projects and transfer of emission reduction

⁶ These two grants were provided by USAID/Washington under the Development Grant Program (DGP). The Climate Change Adaptation and Mitigation Strategies in the Forest Sector of the Russian Regions of the UNESCO World Heritage and Biodiversity Centers project has a budget of \$1,559,500. Intensified and Sustainable Forest Management in Russia has a budget of \$1,570,000.

units (ERUs), and is authorized to give its consent to the agreements. However, the procedures for giving such consent and the consequences of not obtaining consent are not yet defined.

Additionally, according to the new JI Rules, the procedure for determining maximum fees is to be established by MED. The rules, however, do not clearly state whether MED is authorized: (1) to establish a limit for Sberbank fees for services; or (2) to establish a maximum price for ERUs. Taking into account the nature of the carbon trading market, we believe that option (1) should apply, but only experience can show the real impact of this rule.

The Russian registry of carbon units has opened an account for Sberbank and transferred 30 million assigned amount units (AAUs) to it. The AAUs are drawn from a stock of 16.6 billion AAUs that Russia has received to cover its greenhouse gas emissions between 2008 and 2012, the first commitment period of the Kyoto protocol. Since July 2010, 15 projects have been waiting to receive nearly 30 million ERUs, which are converted from AAUs.

Another way of attracting much-needed investments is the utilization of the green investment scheme (GIS), which was first proposed by the Russian delegation at the 6th Conference of Parties UNFCCC (Hague) in 2000. GIS is an innovative financial mechanism based on a country's voluntary decision to reinvest income from sales of national quotas in support of energy efficiency and renewable energy development projects. Experts estimate that the unused portion of Russia's GHG emissions in the first budget period of the Kyoto Protocol (2008-2012) could amount to about 5-6 billion tons of CO₂ equivalent, depending on economic development rates and energy saving scenarios. Clearly, there will not be sufficient demand to absorb such a large volume in the first budget period and, even in the most optimistic scenario, Russia will only be able to sell a small portion of its reserve through the GIS. However, this could be enough to stimulate significant foreign investments.

Implementation of the GIS could become the catalyst for in-depth modernization of the environment management system, providing additional economic advantages and institutional innovations. In 2011, experts anticipate preparation of a number of pilot GIS operations, based on the Government Directive No.884-r, dated June 27, 2009, which calls on MED, the Ministry for Foreign Affairs and Sberbank to hold negotiations with relevant national authorities of interested countries on participation in GHG emissions trading projects. This directive makes Sberbank the authorized organization for implementing pilot GHG trading projects in pursuance of Article 17 of the Kyoto Protocol.

The Kyoto Protocol offers the possibility of carrying over unused emissions quotas from the first to subsequent budget periods. Russia, Ukraine, Poland and other European countries will have a significant surplus of GHG emission quotas in the first budget period and would like these surplus emissions to be carried over. However, the procedure for registering and carrying over the accumulated surplus of national quotas to subsequent periods could become a stumbling block in the negotiations, as it affects the interests of all main groups of countries.

Russia's unused GHG emission quotas could not only be used as an additional instrument for extensive development, but as a resource to help finance transition of the main sectors of Russia's economy to energy-saving and resource-saving development. The idea of exchanging quota reserves for environmental investments could be included in the new international agreement on climate change for the period after 2012.

Increasing numbers of experts are of the opinion that Russia needs to start work on a national GHGs cap-and-trade system, which should be compatible with international carbon market systems. The target is to create incentives for businesses to reduce emissions and to increase energy efficiency by flexible and cost-efficient methods.

2.0 PRESENT ENVIRONMENTAL CONDITIONS IN RUSSIA

2.1 AIR AND WATER QUALITY AND SOLID WASTE MANAGEMENT

AIR QUALITY Average annual levels of air pollution in hundreds of cities and villages exceed sanitary norms. In 2009, the highest category of air pollution was registered in 34 Russian cities with a total population of 9.7 million people. In 40 regions of the Russian Federation, some 54 percent of the urban population experiences high or very high air pollution: Moscow and St. Petersburg (100 percent of the population), Astrakhan, Novosibirsk, Omsk, Orenburg, Samara regions, the Republic of Khakassia, the Khabarovsk *krai*, the Chuvash Republic (75 percent of urban population and more) (MNR of the RF, 2010). About 38 percent of people live where air quality is never measured. Time series of ambient air pollutants indicate that these high contaminant levels represent a modest improvement over the mid-1990s. However, since 2000, emissions have been increasing, as pollution-intensive sectors have grown. For example, during 2000-07, total air emissions from stationary sources grew by 11 percent, while 2008-2009 emissions decreased by 8 percent. In several regions, emissions growth has been dramatic: Leningrad Oblast, 29 percent; Kemerovo Oblast, 21 percent; and Tomsk Oblast, 13 percent (World Bank 2009b). Since 1996, motor vehicle ownership has surged and continues unabated, creating an almost 40 percent increase in emissions from mobile sources, which now account for 41 percent of total atmospheric emissions.

WATER QUALITY Water quality and aquatic ecosystem status are unsatisfactory in the most populated and industrialized regions. Water quality has not improved, as almost no new capacity of treatment facilities has been added. Treatment plants are outdated and deteriorated and there has been little rehabilitation. Russia's largest rivers, the Volga, Don, Kuban, Northern Dvina, Pechora, Ural, Ob, Yenisei and Amur, are considered "polluted"; some of their largest tributaries are classified as "very polluted"; and several rivers are listed as "extremely polluted" (MNR of the RF, 2000-10). Lake Baikal, a unique ecosystem and the world's largest fresh water body, is deteriorating due to ongoing pollution and modification of its hydrological regime.

SOLID WASTE MANAGEMENT Industrial waste generation and waste disposal problems are acute and widespread. Since the mid-1990s, overall waste generation has significantly increased, except for Hazard Class I and II wastes (most dangerous), which have declined somewhat. Hazard Class IV waste – which is usually bulk waste from the power, mining, ferrous metals, non-ferrous metals and heavy-industry subsectors – has increased significantly. The share of total generated waste of all classes of hazardous materials that is recycled and treated fell from 56 percent in 1996 to 40 percent in 2006.

In the 1990s, industrial production and military activities declined; and thousands of facilities and sites were abandoned, many of which had high levels of soil and ground water contamination. A World Bank study (2007a) on Russia's past environmental liabilities (PELs) noted that: (1) PEL magnitude is so large that it may lack international comparators; (2) the legal and regulatory framework for addressing PEL is weak and contradictory; and (3) the institutional structure requires strengthening and capacity building to address PEL. Since no systematic efforts have been made so far to address PEL, environmental risks are likely increasing, along with their financial impacts. The government recognizes the seriousness of PEL issues and is developing a national program to address them.

Municipal solid waste is a major and growing problem. Increasing urbanization, intensively expanding commercial sectors, and the doubling of waste generation per person are in conflict

with outdated norms for estimating waste generation rates, which distorts planning and tariff setting for waste management. In Moscow and St. Petersburg, urban waste generation rates are now typical of middle- to high-income western European countries.

Most Russian urban waste disposal still relies on older landfills⁷, many of which have exceeded technical capacity limits and now represent significant risks to surface and groundwater, and to air quality, if waste is burned. Illegal waste disposal sites and random dumping are common in urban and rural areas. Recycling initiatives to reduce consumer waste by the 40 to 60 percent achieved in other countries have been sporadic, despite strong public and municipal-level interest.

2.2 LAND AND WATER MANAGEMENT

LAND USE The principles of land use in the Russian Federation are regulated by the Land Code (introduced as Federal Law No 136-FZ in 2001). In comparison to the Soviet Land Code, this code made it possible to own private property, albeit with certain restrictions. Nevertheless, the current status of land ownership and land use is extremely complex and unclear. The land may belong to the state at federal, regional or municipal levels or be private. Moreover, the code defines the classification of lands into the following categories: forest, agriculture, settlements, industries, protected areas, defense facilities, federal reserves and some others. There are certain restrictions on the privatization of forests and agricultural lands which, even if privately owned, cannot be used for other purposes than prescribed in the land plan. Some further restrictions on privatizing forests in the forest code made the procedure practically impossible without a land purpose conversion. Lands of protected areas are absolutely ineligible for privatization. However, at the same time, transfer of lands from one category to another is relatively simple; thus, if there is a political will to privatize or start a development project in an area belonging to any land category, the transfer procedure is frequently used.

According to the Land Code, lands can be leased through the following mechanisms: 1) Social lease with zero fee, which is normally used as a substitute for land transfers for socially significant projects and facilities; 2) non-profit leasing, when the land is leased at the so-called social rate (normally applicable for non-profit projects); and 3) commercial leases for other kinds of land use, including agriculture and forestry. The normal leasing period is 49 years with a possible extension for another 49 years, if the agreement terms are properly fulfilled.

Unfortunately, dramatic changes in land use and land cover over the past 20 years, as well as the appearance of numerous new land users, are not adequately documented in national cadastre databases and do not fully comply with current land use legislation. The absence of up-to-date and accurate land records results in numerous conflicts between landowners and land users, such as flourishing unauthorized house construction and uncontrolled tourism development. Uncertainty over boundaries creates a grey area of semi-legal land use and creates incentives for corruption among municipal and regional governments. Protected areas – especially recently founded national parks such as Pribaikalsky in the Irkutsk region – are among the most sensitive spots, with conflicts between park managers, local communities and tourists.

Experience worldwide shows that lack of clarity about land ownership correlates to a lack of concern about sustainable use of that land and an emphasis on short-term profiteering.

⁷ A welcome exception is Vladivostok, where an old open dump next to the seas is being remediated and a new engineered landfill constructed.

AGRICULTURE AND ENVIRONMENT Under the Soviet system, agriculture was harmful to the environment and especially to biodiversity: overuse of pesticides was extremely damaging to beneficial organisms; overuse of chemical fertilizers led to eutrophication of streams, lakes and the Black Sea and damage to their ecosystems; use of heavy equipment for land preparation led to compaction and soils erosion and sedimentation of water bodies; intensive livestock production caused serious water pollution; and lack of private ownership of land was associated with limited interest in sustainability. With the adoption of a market economy, Russia has made some progress on these issues: pesticide and fertilizer use is substantially reduced, although adoption of integrated pest management is still not widely practiced; soil fertility is declining; and abandonment of marginal agricultural land has opened up possibilities for restoring grasslands or forests. However, conservation tillage practices are not yet used and no system of certification for organic products has been developed (World Bank 2007b).

WATER MANAGEMENT The Russian Federation is well endowed with water resources, although they are rather unevenly distributed over the territory; only eight percent of the water is available to the 80 percent of the population that lives west of the Urals. Water withdrawals are only 1.7 percent of renewable resources, of which industry accounts for 60 percent (FAO 1998). Except for small ponds, all water bodies are the property of the state. Water resources management is a function of the Ministry of Natural Resources (MNRE), through the Federal Water Resources Agency. Among the agency's responsibilities are: allocation of federally owned water resources; basin agreements; flood control measures; and permits for water infrastructure. The governing law is the Water Code of 2006 (Russia 2006), which strengthens federal authority over water, sets out the principles for water management at the basin level, and establishes funding mechanisms. Russia is divided into 20 major river basins, and the code provides for Basin Councils, including public participation, for their management. However, establishment of such councils appears to still be under preparation. When they are formed, these councils will need to address issues such as: allocating water among competing uses; resolving issues between administrative jurisdictions within a basin; management of groundwater; water quality management; and setting appropriate fees for water use.

THE MARINE ENVIRONMENT is under threat along many parts of Russia's enormous coastline. Annex E, Case 5 describes the degradation of the Black Sea environment due to overfishing and destruction of sea grass beds, leading to its takeover by an exotic species of comb jelly. This environment is now slowly recovering under the oversight of the Black Sea Commission. A similar commission is also making progress in reducing pollution in the Baltic Sea. However, the Barents Sea is seriously threatened by pollution from urban, industrial, petroleum and military sources. The Arctic coast has already suffered from petroleum and mining development and is now under new and urgent threats from GCC – from melting of the permafrost (detailed in Annex E, Case 2) to the likely opening up of shipping channels as the arctic icecap melts. Black Carbon (Annex E, Case 1) poses another major threat, although some work is starting with support from the US Government.

The Bering Sea and Sea of Okhotsk contain some of the world's major fishing grounds and – while they are less contaminated than the bodies of water just described, the water quality in Okhotsk Sea around Sakhalin Island and the Amur river mouth is worsening (MNR of the RF, 2010). The hydrocarbons level has increased two-fold (in comparison with the maximum allowed concentrations) and sometimes exceeds this limit by a factor of 12, and phenols and heavy metals can be measured up to 2.5 and 4 (respectively). Oxygen content in these areas is also significantly reduced. The inner parts of the sea are relatively clean, and except near river mouths, threats to fish stocks are mainly from inadequate management and overfishing.

Most of the Pacific coastline is relatively uncontaminated, except for the bays around Vladivostok, which are seriously impacted by urbanization, industry, shipping and oil development and past military operations. However, the current construction of five wastewater treatment plants in preparation for the Asia-Pacific Economic Cooperation Summit (APEC) in 2012 is a very welcome development, especially for the historic harbor of Zolotoy Rog (Golden Horn) in the heart of the city. Nevertheless, problems of toxic bottom sediments, uncontrolled dumping of dredged spoil, inadequate systems for oil spill surveillance and clean up, and lack of facilities for treating ballast water remain issues to be addressed. The tendency to bypass environmental impact assessments in order to fast track new projects is also worrisome (see section 4.2).

EMERGENCY PREPAREDNESS

The inadequate government response to the 2010 forest fires (described more fully in subsequent chapters) highlights the weakness in emergency preparation. Although a full review of emergency preparedness was beyond the scope of the ETOA, the Team would like to emphasize one of the most likely consequences of global warming: more frequent and more severe extreme events such as heat and cold waves, droughts, fires, and, floods. All of these will have severe consequences for human life, the economy and ecosystems, although awareness of this is still very limited. The north flowing rivers of Siberia and the Russian Far East (RFE) already experience periodic spring flooding due to ice jams, and this could become a major issue as GCC intensifies.

2.3 FORESTS

Twenty-two percent of the world's forests are located in the Russian Federation, and the majority of this large natural resource consists of boreal forest. These forests are located in European Russia, Siberia and the Far East and represent the global eco-regions known as the Scandinavian and Russian Taiga, West Siberian Taiga, Eastern Siberian Taiga, Kamchatka Taiga and Grasslands, and the Ural Mountain Taiga, as well as some others. Smaller temperate forests also lie in three global eco-regions and include the RFE Temperate Forests (Amur-Heilong), Caucasus-Anatolian-Hyrcanian Temperate Forests and Altai-Sayan Montane Forests. Russian forests are also significant as one of the four remaining mega-areas of intact forests in the world.

These forests are important areas for biodiversity conservation, local livelihoods and economic development. The Global Forest and Trade Network (2010) notes that Russian forests have the highest biodiversity and endemism among boreal forests and that they provide a carbon sink for 15 percent of global CO₂ emissions. They provide critical habitat for a variety of plants and animals including brown bears, Amur tigers and the highly endangered Amur leopard. Despite these values and the fact that Russia is one of the key players in world timber trade, illegal and unsustainable timber harvesting continues to threaten Russia's pristine regions.

The vulnerability of the forests in these tracts is also being called more and more into question because of their monotypes. In Siberia, east of the Yenesei River, the extreme continentality and nearly continuous permafrost gives rise to vast areas dominated by larch (*Larix dihurica*). Decomposition on the forest floor is slow, even in the summer months due to the presence of the permafrost and the acidic nature of the fallen larch needles. Only mosses and lichens grow, providing the preferred seedbed for more larch. Without the benefits of diversity in the vegetation, the forest is especially susceptible to insect and disease infestations. Larch in some areas has been particularly hard hit by pests with infestations lasting 2-3 years in succession, resulting in tree mortality of nearly 100 percent (Day, 2006).

Larch grows best on the thin, waterlogged substrate in the level areas underlain with permafrost, and as noted elsewhere in this report, climate change and warming temperatures put these areas at even greater risk for change. Overall, under these conditions, the vast larch forests in the boreal region would become even more susceptible to disease and insect infestation and fire. Complementing the risks from climate change are the added dangers from the debris of forest harvesting, road construction, mining development and oil and gas exploration, which is more prevalent in the taiga every year. Monotypes, such as these vast expanses of larch forest, can be made more vulnerable to pests and fires if proper silvicultural techniques are not used, or if phytosanitary practices for slash and other land clearing debris are not appropriately applied.

In 2009, timber harvesting in Russia amounted to 159 million cubic meters⁸ (2010 estimate of 130 million total cubic meters⁹ plus a nominal estimate of 15 percent for illegal logging), which is only about 25 percent of the allowable cut of timber (626 million m³) and 43 percent of commercially accessible timber (367 million m³). Also, timber re-growth is estimated to be about 800-900 million m³ per annum or five times the volume harvested. Nevertheless, the sector has substantial problems. Harvest practices in many areas lead to significant environmental impacts, such as soil erosion, and harvesting tends to be concentrated close to the existing transportation routes and in the border areas, which leads to localized over-harvesting and induces serious threats to ecosystems in such areas. Also there is a strong preference, especially among illegal loggers, to cut trees of high value or endangered species (Korean pine, Far Eastern linden, and other deciduous trees).

Threats to forests and their biodiversity are covered more extensively in Part II of this report.

2.4 FISHERIES

Russian fisheries play an important role in the nation's economy. With access to 13 seas of three oceans, more than two million kilometers of rivers, and over 22.5 million hectares of lakes, these habitats are extensive and varied. There are three main fisheries subsectors: marine (which include anadromous species, estuarine fisheries, and brackish water species); inland; and aquaculture. Marine fisheries are based on the seas surrounding Russia, the landlocked Caspian Sea, and the high seas beyond Russia's Exclusive Economic Zone.

Statistics reported by the Food and Agriculture Organization (FAO 2007) note that marine capture fisheries within Russia's borders (and its Exclusive Economic Zone) account for about three-quarters of the total catch. (Catches on the high seas are usually less than 10 percent.) Inland fisheries are found everywhere, but the catch is only a small fraction of the total. Inland commercial fishery production is also small (less than three percent of the total catch), as is aquaculture compared to the capture fisheries (about 3.6 percent in 2005). Subsistence fishers of indigenous groups – fishing mainly in estuaries, lagoons and rivers – are legally bound to use their catch only for local consumption.

According to the FAO (2005), in 2005 the Russian fishing industry harvested 3,190,946 tons of fish from wild fisheries and another 114,752 tons from aquaculture. This made Russia the ninth leading producer of fish, with 2.3 percent of the world total.

⁸ Interview with the Director of the Department of Forestry, Ministry for Agriculture Alexander Panfilov (Kommersant newspaper, 16.10.2009, No 193).

⁹ www.rosleshoz.gov.ru – Official Russian Federal Forestry Agency.

Salmon comprise a significant portion of the annual catch in Russia – 20 percent¹⁰. In 2009, the salmon catch was particularly heavy and was estimated at 542,000 tons, compared to 260,000 tons in 2008. Data for the entire year in 2010 is not available, but the first six months show comparable numbers to 2009. Uncontrolled and illegal salmon fishing, habitat degradation and inefficient fishing governance in the Russian streams causes serious threats to the salmon population diversity and sustainability (UNDP Project RUS/99/G42/A/1G/99 report). Salmon along the Pacific Coast are under threat from overharvesting; among 13 salmon species and sub-species in the RFE, at least nine are endangered.

Increased pressure from commercial fisheries leads to declining opportunities for local indigenous people and the protected species dependent on salmon (Kamchatka bear subspecies). Threats from pollution for salmon are mostly associated with the sea, since salmon enter polluted rivers (in particular, the Amur River) only for spawning and do not feed during this time.

Wild salmon conservation efforts include:

1. Maintaining salmon hatcheries funded by the state and businesses. There are a number of hatcheries in Sakhalin Island run by private businesses, and these are quite successful.
2. State programs on salmon fish resources protection (e.g. the Russian State Program “Bioresources” is mainly focused on salmon conservation); and
3. NGO programs on salmon conservation (partially supported by USG funds). For example, the Wild Salmon Center’s program in three RFE regions has been funded through PASA to the USFS’ earmark. The grant to support the Center was \$125,000 in 2010.

In addition, sturgeon in the Caspian Sea and Kaluga sturgeon from the Amur River are also under threat. Currently there is a total ban on catching and sales of Caspian sturgeon in Russia, as the state of sturgeon species populations is estimated as critical (MNR of RF, 2010). This ban includes all fish and caviar entering the market from Russian sources, and has caused tension between Caspian Basin countries (such as Iran) that fish sturgeon in the sea while the population is mainly regenerated in hatcheries along the Volga River in Russia. In 2009, the actual release of sturgeon young exceeded two million individuals.

In total, there are 160-170 species of finfish and invertebrates taken from marine ecosystems and about 60 from inland fisheries. General management of fishery stocks (both marine and freshwater) is governed by the law on Fishery and Protection of Aquatic Biological Resources established in 2004.

2.5 BIODIVERSITY

The status of biodiversity conservation, major threats and proposed actions are covered extensively in Part II of this report and thus are not summarized here.

Salmon are the best species indicator of coastal ecosystem health

“Salmon are inseparable from their freshwater and estuarine ecosystems. This is true of all species, but especially true of salmon. Juvenile salmon and steelhead use the entire river ecosystem, from headwaters to the ocean. They are extremely sensitive to changes in water quality, trophic webs and upstream perturbations to the river flow, turbidity and temperature. Juvenile salmonids feed on freshwater invertebrates that are also indicators of water quality. Generally, the more pristine, diverse and productive the freshwater ecosystem is, the healthier the salmon stocks. Declines in the capacity of a watershed to grow juvenile salmonids can indicate declining ecosystem health.”

Source: Rahr, 2011

¹⁰ Russian Fishing Agency Data on Catch of fish resources in January-December, 2009, Moscow, 2010, fish.gov.ru

3.0 COSTS OF ENVIRONMENTAL DEGRADATION¹¹

3.1 UNDERLYING CAUSES

The present unsustainable state of the environment in Russia owes much to the priorities of the Soviet period: resource extraction, heavy industry and the military. Little attention was paid to the social or environmental costs, and the protest movements in the 1960s and 1970s that led to corrective actions in western countries were effectively suppressed. Prices were set arbitrarily and played little part in resource allocation, particularly with energy, leading to excessive energy consumption and over-reliance on dirty fuels such as coal. Public awareness of the costs of environmental degradation was, and remains, limited.

After Russian independence in 1991, recognition of the need to protect the environment grew, a Ministry of Environment was established, and the tools of environmental management developed. However, from 2000 to 2009, little further progress was made; in fact, earlier instruments, such as environmental impact assessment, were largely abandoned, as a result of pressure from the business lobby. Environmental fees and fines were not increased with inflation and remain far below the levels needed to influence the behavior of polluters. Environmental management was put under the same ministry responsible for natural resources exploitation.

3.2 ECONOMIC COSTS

Environmental degradation damages the Russian economy. Every year, Russia's gross domestic product (GDP) is reduced by *four to six percent* due to illnesses linked to air and water pollution. In Russia, the unfolding economic crisis and increasing levels of poverty accentuate rising social and political risks associated with an unhealthy environment, including the accelerating erosion of citizens' productivity and quality of life. Past environmental liabilities (PELs) are mounting and future economic losses will be even steeper unless addressed.

The Russian economy depends heavily on raw-material extraction and processing – primarily oil, gas, coal, and metals – which are sectors with significant environmental impacts. This dependence has increased considerably over the past fifteen years. By 2005, the GDP shares of the power sector and ferrous and non-ferrous metallurgy had increased two- or three-fold compared to 1990; jointly, these sectors accounted for more than 50 percent of the Russian economy.

Since 1999, Russia's annual GDP growth has generally exceeded six percent per year. However, a less positive growth picture emerges if different economic indicators are used, such as **adjusted net savings**, which take into account depletion of natural capital and the consequences of environmental pollution. In 2006, despite real GDP growth of 6.7 percent, adjusted net savings were negative (-13.8 percent), largely because of natural resource depletion. Especially alarming is the worsening trend over recent years in adjusted net savings: -4.4 percent in 2004, -10.4 percent in 2005, and -13.8 percent in 2006. Countries such as Norway, Canada, the United States, and the United Kingdom rely extensively on natural capital, yet generate positive adjusted net savings.

¹¹ This chapter draws heavily on the World Bank study, "Russia Environment Management System: Directions for Modernization" (2009b).

Poor environmental management reduces competitiveness. Russian companies have been slow to introduce international corporate management or comply with environmental management standards such as those of the International Organization for Standardization (ISO). Russia was ranked 50th in ISO compliance in 2008, having issued only 267 certificates of ISO 14000-compliant industrial management, lagging behind all BRIC countries (Brazil, Russia, India and China); China had issued 30,489 certificates; India, 2,640; and Brazil, 1,872. Moreover, Russian companies are rapidly falling behind in introducing other voluntary, market-based environmental mechanisms, such as certification and publication of nonfinancial reports verified by an independent third party (see section 8.1 on forest certification).

3.3 HEALTH AND OTHER COSTS

Environmental quality is poor for the 60 percent of Russians who live in about 15 percent of Russia's territory. Breathing polluted air cuts Russians' average life expectancy by *about one year* and, in the most polluted cities, *up to four years*; air pollution is directly responsible for up to *eight percent* of overall annual mortality. Furthermore, about 10 million Russians drink water that fails to meet federal safety standards for permissible concentrations of one or more harmful substances, such as hazardous chemicals. Waste water is inadequately treated in most urban centers, as are municipal and hazardous solid wastes, with largely unknown impacts on human health.

Across the vast Russian Federation, environmental quality varies widely. National experts believe about 65 percent of the total Russian territory of 17 million km² can be characterized as pristine – almost unaffected by economic activities and with ecosystems that are fully preserved.¹² These areas, which represent about 22 percent of the world's undisturbed ecosystems, have global value and significance for biodiversity protection, carbon sequestration, and other critically important environmental functions. However, ecosystems (especially aquatic habitats) closer to urban and industrial centers, petroleum and mining development are heavily impacted by pollution. These impacts are described more fully in Chapter 9.

3.4 LINKS BETWEEN ENVIRONMENTAL MANAGEMENT, ECONOMIC GROWTH, HEALTH AND GOVERNANCE

The situation just described owes much to the politics of the last decade. With the strong support of the private sector, the government has opted to emphasize economic growth, especially in extractive industries, with the feeling that environmental impacts can be addressed later. Public awareness of the environmental consequences of such policies remains limited. While thousands of environmental NGOs exist and are having some influence on local problems, few have sufficient clout to be heard nationally.

However, there have been recent signs that things are beginning to change. Over the past two years, President Medvedev has issued a number of directives on reforming environmental management, and he and Prime Minister Putin have frequently echoed environmental themes in speeches at various forums, such as the November 2010 Tiger Summit. Among the areas listed for reform are: re-establishing the system of environmental impact assessment; the use of best available technologies in place of numerous and unenforceable concentration standards; reform of the system of pollution fees and fines and possible use of an environmental fund; greater public participation; use of renewable energy; waste recycling; cleanup of legacy waste; and many other issues. However, the deadlines for most of the President's directives have recently passed, and only a few were completed as ordered; MNRE drafted several laws and normative

¹² Danilov-Danilian, 2003; Roshydromet, 2007.

acts but did not manage to get agreement with other ministries. The most important drafts are strongly criticized by NGOs, business associations and other ministries. It is not clear to what extent the proposed legislation will provide environmental integrity and when it could be introduced. The weakness of that ministry (see section 4.3) is one obstacle, a backlash from the industrial and mining sectors may be another.

Serious forest fires in the summer of 2010 have also spurred action on restoring sustainable forest management. National prestige may also be a positive factor, as witnessed by the massive program of public works being undertaken in and around Vladivostok in preparation for the 2012 APEC Summit. On a smaller scale, similar things are happening in Sochi, in preparation for the 2014 Winter Olympics. Russia's desire to join the World Trade Organization and the dialog with the European Union (EU) may also be spurring the recent rhetoric about adopting international environmental standards.

3.5 ENERGY EFFICIENCY

Russia remains one of the least energy efficient among the ten largest industrialized countries. Despite a gradual improvement over the past 20 years, it still consumed 0.42 TPES (total primary energy supply) per unit of GDP in 2007, which exceeded the world average (0.20) by a factor of two and is far larger than in such countries as Great Britain (0.12) and Japan (0.14).

There is a growing understanding in Russia of the need to improve energy efficiency (EE) in three main areas: industry, communal¹³ and housing. According to some Russian energy sector experts, EE is considered to be the "new alternative source of energy". Historically, EE activities were started at the local level, without any directives from higher levels, and were based exclusively on market incentives. In the early 2000s, such actions were supported in many Russian regions and municipalities. The leading regions across Russia are Tatarstan Republic, Sverdlovskaya Oblast and Khabarovskiy Krai, which developed quite advanced legislative systems to promote energy efficiency, not only in the industrial sector but also in the budgetary sphere, which historically had little interest in implementing EE activities.

Recently the problem was recognized at the federal level in the adoption of the Federal Law No 261 "On Energy Efficiency and Energy Savings ..." According to this law, legal regulation in the field of energy efficiency and energy savings is based on the following principles:

- 1) Efficient and rational use of energy resources;
- 2) Support and stimulation of EE and energy savings;
- 3) A consistent, integrated approach to measures aimed at EE and energy savings;
- 4) Planning EE and energy savings;
- 5) Utilization of energy resources with due consideration of the resource, industrial and technological, environmental and social conditions.

The new law also puts a framework on State regulation related to energy efficiency and energy savings and defines ways of increasing EE in the regions and municipalities.

However, while the law itself is a very progressive and long-awaited tool for increasing efficiency of energy resources use in the country, the current situation with practical implementation of energy efficiency projects, development of Energy Service Companies and other related activities, remains unclear. The Team's meetings with regional authorities, such as the

¹³ Public facilities such as schools, hospitals, and administration; also known as the "budget sector".

Khabarovskiy Krai Committee on Energy Efficiency, showed that, after the introduction of the new Federal Law, many regional and local legal acts on EE lost their validity and now have to be brought in line with the new legislation. This gap between the Federal policy on energy efficiency and existing local and regional practices remains the major obstacle to increasing Russia's energy efficiency and requires serious and urgent efforts from regional and local legislators to ensure smooth development of EE projects.

Many constraints are holding back securing private investments in energy efficiency projects, especially the unreformed system of state regulation of energy tariffs. The current Federal Law No 41 "On Energy tariffs regulation..." opens the potential for investments to increase the efficiency of energy production. However, this law sets very complicated rules and tight time frames, which have the effect of minimizing profits and extending return periods, thus preventing private investors from providing substantial financing for energy efficiency projects in Russia.

Several other legal problems also prevent the rapid dissemination of energy efficiency activities in the budgetary and communal services sphere at the local level. The procedure of segregating, accumulating and reinvesting energy savings remains the most pressing and complicated legal question. Because of restrictions imposed by the Russian Fiscal Code, municipalities, and especially subsidized ones (the great majority), are usually unable to reinvest these savings within the structure of their budgets. However, based on the work of USAID-supported programs (see Chapter 5), a list of tested reinvestment mechanisms have proven to be viable:

- Municipal and regional targeted programs, like those successfully implemented in Vyazemskiy Raion of Khabarovskiy Krai within the Community Development Support Program (CDSP), Tatarstan Republic and other regions.
- Regional and raion regulations on reinvestment, such as those adopted in Khabarovskiy municipal district of Khabarovskiy Krai in 2005;
- The use of Local Community Funds, successfully tested in six municipalities in the Republic of Buryatia in 2006-2009 within the CDSP program;
- Reinvestment within one tariff period (for private firms), used, for example, by most of the project supported private companies in the communal sectors of Khabarovskiy and Primorskiy Krai.

Experience under CDSP shows that local participation is strongest when the municipality is able to retain the savings from energy efficiency improvement and reinvest these funds in program expansion or other productive purposes. The Assessment Team recommends that savings from any future EE project be isolated and reinvested by the private sector, or at least a non-budgetary enterprise, like the contractor implementing the EE project, or the communal services enterprise, using the possibilities provided by Federal Law No 41, 261 and Budgetary Code. There is minimal risk of corruption in this sphere since all reinvestment mechanisms are associated with targeted budgetary funds and programs that are much more transparent than routine municipal, regional and Federal budgeting. The utilization of these mechanisms and the implementation of energy efficiency projects may help bring municipalities to solvency and create conditions for discontinuing subsidies and, thus make them less dependent on fiscal restrictions and more flexible regarding sustainable community development.

Another important area for increasing energy efficiency in Russia is the housing sector. The Russian National System of Construction Norms and Rules includes certain requirements on buildings' energy efficiency; however they are outdated and frequently ignored during construction. The current policy embodied in Federal Law No 261 prescribes equipping all

households (both individual houses and apartments) with commercial heat and electricity meters. However increasing efficiency of the houses themselves is normally done either using funds of the householders or from regional and municipal programs. The advancement of such programs is extremely variable among different Russian regions, given the limited access to credit resources.

Recently established cooperation between USAID and Russian Energy Agency (REA) may be a good platform for dissemination of best practices emerging from both programs in the US and US-funded projects successfully implemented in Russia. As REA has a network of regional offices, it might also help to disseminate US experience in building smart grids and increasing the capacity and professional level of ESCOs.

An important recent development was the approval of the State Program on Energy Conservation and Energy Efficiency Increase for the period up to 2020. Its aim is to support implementation of the Federal Law No 261.

Among the recent initiatives in energy efficiency is the \$722 million five-year “Russia Energy Efficiency Programme¹⁴” – a partnership of UNDP, IFC, EBRD and UNIDO, involving key Russian federal sectoral agencies and regional authorities - with \$55 million approved under the 4th replenishment cycle of the GEF, with a record \$667 million in cofinancing. This program includes:

- One project on industrial energy efficiency: “Improving Energy Efficiency in GHG-Intensive Industries (implemented by EBRD and UNIDO, supported by the GEF with \$15.4 million, and \$307.6 million in cofinancing).
- Two projects on household use (lighting and other appliances): “Introducing Energy Efficiency Standards and Labeling” (a project implemented by UNDP and supported by the GEF with \$7.8 million, and \$57.4 million in cofinancing) and “Transforming Markets for Energy Efficient Lighting” (also implemented by UNDP and supported by the GEF with \$7 million, and \$65.7 million in cofinancing).
- Three projects on buildings: one project on enforcement of building codes in new buildings at the regional level – “Improving Energy Efficiency in Buildings in Northwest Russia” (implemented by UNDP and supported by the GEF with \$5.8 million, and \$27.5 million in cofinancing); one project on financial mechanisms (ESCO) to improve the performance of existing municipal buildings (implemented by EBRD and supported by the GEF with \$9.2 million, and \$68.6 million in cofinancing); and one project – the one detailed above – on financial mechanisms to improve the performance of existing residential buildings – “Improving Energy Efficiency in Urban Housing” (implemented jointly by EBRD and IFC and supported by the GEF with \$9.6 million, and \$140 million in cofinancing).

The anticipated results of this umbrella initiative include the development and enforcement of strong policies and regulations and a sustainable financial mechanism for achieving large-scale energy savings and GHG emissions reduction in Russia and other emerging and developing countries.

¹⁴ www.thegef.org

4.0 ENVIRONMENTAL MANAGEMENT SYSTEMS

4.1 STATUS OF ENVIRONMENTAL MONITORING

Russia has a broad public monitoring system that evaluates environmental conditions by relying on agency-specific methods, approaches, and laboratory networks. In accordance with the functions distributed among different ministries and agencies, the Russian Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet) is responsible for environmental monitoring, data processing and analysis, preparation of annual reviews on the state of the environment, and prediction of changes in the ecological situation. Its national network of environmental monitoring is based on routine observations at specific sites, in cities, water bodies and streams in areas with high human impact, and in unpolluted areas.

As of 2009, monitoring of air pollution was carried out regularly in 224 cities and towns (out of the total 1,095 cities and 1,359 settlements in Russia). In most cities, concentrations of five to 25 substances are measured. Observation of atmospheric transboundary transport of substances is carried out at four stations in the European part of Russia and four stations in the Asian part.

Monitoring of surface water pollution through physical-chemical indices is carried out on 1,190 water bodies (2,488 sites). Due to a lack of funding, this network is shrinking. Observations of surface water pollution through biological indicators are made in 74 water bodies from 202 sites; observations of marine pollution are carried out at 320 stations in 11 coastal seas. The Federal Water Resources Agency (Rosvodresursy) carries out physical-chemical observations and monitors the water quality in water bodies at 996 sites. Some observations relevant to climate are also conducted by other agencies and institutions (for instance, the Ministry of Defense and the Russian Academy of Sciences). However, Roshydromet carries out the bulk of observations, significantly exceeding those undertaken by other agencies.

The monitoring of soil contamination by pesticides is carried out in 38 regions of the Russian Federation, and the level of radiation in hospitals is measured at 1,285 points. The network for integrated monitoring of environmental pollution and the state of vegetation has 30 posts; the network of stations that monitor the chemical composition and acidity of precipitation has 142 stations; and measurements of pollution in snow are taken at 565 points. (State Report, 2010)

Russia has a nominally comprehensive system of ambient environmental standards that cover a vast number of parameters compared to national systems in other countries, even though some critical parameters are excluded, such as fine particulate matter in air, which should be a priority for measuring health impacts. However, when Russian standards are compared to international standards, they are often unrealistically stringent, inflate apparent risks, omit higher priority risks, and are impractical to enforce given the existing capacity of the country's monitoring systems. At the same time, Russia has no sound basis for efficient measurement or monitoring of environmental performance or risks, and no flexibility for taking account of local contexts (World Bank, 2004 & 2009b).

The general conclusion of all independent assessments is that the environmental monitoring system in Russia is fragmented, the institutions involved are not well integrated, and the deterioration of technical capacity has reduced the ability to monitor toxic substances and priority pollutants such as fine particulate matter. The degradation of Russia's ambient water and air monitoring systems in the 1990s has not only affected Russian environmental management programs but impacted global monitoring systems as well.

4.2 POLICIES AND LAWS

The Constitution of the Russian Federation declares the right to a favorable environment, reliable information about its condition, and compensation for damages to a citizen's health or property by an environmental offence. Fundamentals of environmental policy in Russia are enshrined in the Federal Law "On Environmental Protection," other laws and decrees of its President, the State Strategy of the Russian Federation on Environmental Protection and Sustainable Development, the Concept of Transition of the Russian Federation to Sustainable Development, the Environmental Doctrine of the Russian Federation and other strategic documents.

By the mid-1990s, Russia had established the legal and institutional elements of its Environmental Management System (EMS), as well as the basic technical and management capacity to support it. However, since the late 1990s, efforts to attract foreign direct investment encouraged the relaxation of perceived environmental barriers to economic growth, which led to weakening Russia's EMS and environmental institutions. Before 2008, environmental issues figured little in state policy, and environmental protection was not incorporated into priority national projects. In parallel, over the last ten years, Russia's international environmental policy also weakened; it has participated in fewer international forums that are shaping new global environmental initiatives, programs, and projects.

The current Russian environmental legislative framework, rather patchy as it is, consists of a set of more than 70 federal laws and 4,000 subordinated legislative acts. Despite the large volume of legislation, most of it is largely declaratory in nature, lacking the body of subordinate legislation that constitutes the essential enforcement mechanism for environmental statutes and international agreements (HES II, 2009). Economic incentives to enhance environmental performance are hardly used.

A detailed overview of Russia's Forest and Biodiversity-related Legislation, Policies, Strategies, Programs and Concepts and nature conservation outside protected areas is presented in Chapters 8 and 10 of this report.

State control¹⁵ in the field of environmental protection is of 12 kinds: geological; water; land; control and surveillance in the protection, use and reproduction of wildlife and their habitats; monitoring and supervision in the organization and functioning of protected areas; control over air protection; waste management; forest monitoring in protected areas; monitoring for the protection of Lake Baikal; as well as control in the internal maritime waters, territorial sea, exclusive economic zone and continental shelf of the Russian Federation (State Report, 2010).

The Russian Government is becoming aware of the inefficiency of state regulation in the field of environmental protection. On May 25, 2010, Minister Y. Trutnev outlined the main problems as follows:

- The mechanism of the state ecological expertise (environmental impact assessment) is almost eliminated (it covers less than five percent of all investments);
- The system of emissions regulation is subjective and allows businesses to have virtually unlimited impact on the environment;
- Fees for negative impacts are minimal, have not been indexed since 1991 and do not encourage businesses to implement green technologies;

¹⁵ This term in the Russian language equates more to monitoring and reporting than to actual improvement in environmental conditions.

- Penalties for violations of environmental laws are minimal; and
- There are no mechanisms for the elimination of accumulated past environmental damage (MNR presentation, 2010).

Following the decisions of the RF President and Security Council, in 2008 the Ministry of Natural Resources (MNR) proposed a large-scale agenda for improvements, including modernizing environmental legislation in the following three ways:

- *Modify environmental protection regulations*: introduce a system of integrated environmental permits, including a simplified procedure for small- and medium-size enterprises; reduce the number of regulated chemical substances and compounds; increase penalties for environmental damages; and, replace fees with court-imposed fines to compensate for damages due to excessive pollution.
- *Introduce modern management methods*, such as environmental insurance (voluntary and mandatory) and environmental certification and audit.
- *Provide economic incentives to adopt new technologies* by introducing mechanisms such as a system of tax and non-tax incentives for enterprises.

A second stage of proposed changes would include reforms to existing environmental impact regulations, including adopting the use of best available technologies. MNRE estimates this transition would take four to five years. However, the MNRE's plans for environmental improvements have not made progress over the last two years due to lack of political will and strong opposition from the business sector (see section 4.4 below). There have been recent signs that things are beginning to change: over the past two years, President Medvedev has issued a number of directives on reforming environmental management: re-establishing the system of environmental impact assessment; the use of BAT in place of numerous and unenforceable concentration standards; reform of pollution fees and fines and possible use of an environmental fund; greater public participation; use of renewable energy; and, cleanup of legacy waste. However, the deadlines for most of the President's directives have recently passed, and only a few were completed as ordered; MNRE drafted several laws and normative acts but did not manage to get agreement with other ministries. The most important drafts are strongly criticized by NGOs, business associations and other ministries. Key reasons of this poor progress are lack of internal capacity in MNRE on legislation drafting and strong opposition from the business sector (see section 4.4 below).

It is not clear on when the proposed legislation could be introduced and to what extent it will provide environmental integrity.

4.3 PRINCIPAL INSTITUTIONS AND THEIR EFFECTIVENESS

During the most recent decade, the EMS has been characterized by frequent and inadequately formulated changes to its institutional structure and legal and regulatory framework at the federal, regional, and municipal levels. Principal among these were changes initiated in 1996, when the Ministry of Environment and Natural Resources (MENR) was reorganized and became the State Committee for Environmental Protection, which was then abolished in 2000 with its functions transferred to the Ministry of Natural Resources (MNR). In 2004, another broad administrative reform redistributed environmental protection functions among MNR, the Federal Agency for Surveillance in the Natural Resources Use Sphere (Rosprirodnadzor), reporting to MNR, and the Federal Service of Ecological, Technological and Nuclear Surveillance (Rostekhnadzor) reporting directly to the Government. However, the division of responsibilities was unclear, resulting in many gaps and overlaps in functions and poor coordination among

federal supervisory bodies. Widespread staff reductions depleted the capacity of structural units responsible for environmental control and enforcement and precipitated a decline in staff qualifications. After a further reorganization in May 2008, Rostekhnadzor and RosHydromet reported to MNR, which has since become the MNRE. In accordance with the most recent changes, Rostekhnadzor (and the Federal Forest Service) now report directly to the Government of the Russian Federation.

One positive recent development has been decentralization of EMS functions to the regions and municipalities, although marred somewhat by inconsistent and incomplete processes. This process is fundamentally important over the longer term. As a result, some regions have successfully established operational EMS, putting in place efficient coordination mechanisms and using new environmental protection powers in environmental protection.

4.4 ROLE OF THE NGO AND PRIVATE SECTORS

Despite the apparent intensification of activities of the country's leadership in the field of ecological policy (several high-level meetings held and dozens of orders issued to the ministries during the past year and a half), there is a growing criticism of the present EMS from environmental Non-Governmental Organizations (NGOs). Noteworthy is the article "Paper Vertical", published in one of the leading newspapers, which states, "To date, out of 67 orders of the President of the Russian Federation and the Russian Government only six have been fully implemented – it is less than 10 percent." The authors – staff at World Wildlife Fund/Russia – believe that these figures indicate a lack of systematic management in the environmental area; only some of the most pressing problems have been resolved. The authors argue that an attempt to execute orders on environmental management modernization without active participation of civil society is the main reason for unsatisfactory progress. They argue that all progressive anti-corruption proposals of ministries and departments are blocked by backward-oriented resource extraction businesses lobbying for their own interests. (Chestin et al, 2010)

The consolidated position of environmental groups was demonstrated at the all-Russian conference "Ecological Modernization of Russia – the role of science and civil society", held on October 25-26th of 2010 in the Moscow region. The conference was attended by about 200 leaders of environmental NGOs from all regions of Russia, scientists, experts and journalists. According to a key report (Nikitin et al, 2010), resource development of the country and the petrodollar economy is a path leading to a dead end and is incompatible with the concept of civil society. Gains in oil revenues are not connected, and are even contrary, to the growth of living standards. Therefore, it is important for environmentalists to find answers to the questions: "What methods and resources exist to change the situation?"; "Is it possible to involve civil society in ecological modernization?"; "Does the society itself really want ecological modernization?"

In his report, Mr. I. Blokov (Greenpeace) gave examples of how the current political and business communities in Russia ignore the need for environmental control. According to a Greenpeace assessment, the number of illegal acts against environmental legislation in Russia has reached 10,000 in the past year. At the same time, the government was not able to deal with natural disasters such as the summer fires of 2010 (Press Release, 2010).

A harsh assessment of modern environmental policy in Russia was given in the resolution of the conference: "The Ecological Doctrine of the Russian Federation, the only document in the field of environmental policy, prepared with the participation of science and civil society over the past decade, was not implemented in any of the important points... In general, over the past years there has been de-greening of public administration and public participation, thus compromising the ecological security of the country. The ecological situation in Russia is out of control. In the

interest of ecologically sustainable development and ensuring the ecological health of the population, the strong environmental modernization of the state and society should be implemented."

The Russian business community plays a largely negative role in developing and implementing environmental policy. Russian companies have been slow to introduce international corporate management or comply with environmental efficiency standards such as ISO standards in the 14000 series (section 3.2). Moreover, Russian companies are rapidly falling behind in the introduction of other voluntary, market-based environmental mechanisms, such as certification and publication of nonfinancial reports verified by an independent third party. In particular, no Russian bank or investment company has yet adopted the Equator Principles or the United Nations Principles of Responsible Investment, the most widespread mechanisms for environmental and social responsibility of financial institutions. A recent World Bank report concludes that "poor environmental management reduces competitiveness" (World Bank, 2009b).

4.5 ROLE OF INTERNATIONAL OBLIGATIONS AND EXTERNAL ASSISTANCE

Throughout the 1990s (after the USSR broke up and the Russia Federation was formed), the Russian Federation participated actively in international forums and processes. (A list of international environmental agreements is presented in Attachment 3 of Part II.) However, since 2000, Russia's international environmental policy has evolved, and less interest has been shown in international events, new initiatives, or professional contacts with international counterparts. Particularly noticeable were reduced contacts between experts. In recent years, there have been some positive developments but, in general, Russia's participation in international environmental cooperation does not match its growing role in the world, is not substantial enough to meet its international obligations, and limits the integration of experience and best international practices in the development and implementation of national environmental policies and improvement of the EMS.

Of particular concern is the fact that the conventions and protocols to which Russia is not a party are mainly those agreements that regulate hazardous chemicals adversely affecting human health and the environment. For example, Russia does not participate in implementation of five out of eight protocols to the 1979 Geneva Convention on Long-range Transboundary Air Pollution dealing with: (1) acidification, eutrophication and ground-level ozone; (2) persistent organic pollutants; (3) heavy metals; (4) sulfur emissions; and (5) volatile organic compounds or their transboundary fluxes.¹⁶

Russia has not ratified the Stockholm Convention¹⁷ on Persistent Organic Pollutants and it is not a Party to the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, and the UNECE¹⁸ Convention on Access to Information, Public Participation in Decision-making and Justice in Environmental Matters (Aarhus Convention). Even though Russia has legislated several provisions of the Aarhus Convention, the failure to ratify it is worrisome – in the view of the ETOA Team – as full access to information is fundamental to public awareness and to progress on environmental

¹⁶ http://www.unece.org/env/lrtap/lrtap_h1.htm

¹⁷ Stockholm Convention on Persistent Organic Pollutants:
<http://chm.pops.int/Countries/StatusofRatifications/tabid/252/language/en-US/Default.aspx>

¹⁸ United Nations Economic Commission for Europe

management. The Aarhus Convention gives the public rights of access to information, public participation and access to justice, in governmental decision-making processes on matters concerning the local, national and transboundary environment. It focuses on interactions between the public and public authorities. Ratification is crucial for the Russian public, given the fact that many environment-related decisions are taken secretly.

Bilateral international cooperation in the environmental protection area also decreased significantly. The most active cooperation has been kept with the EU. The basis of EU-Russia relations is the Partnership and Cooperation Agreement, which came into force on December 1, 1997 for an initial duration of 10 years.

Organizational changes in the Russian environmental administration since 2000 hampered environmental dialogue in the following years, but more recently there has been encouraging progress. The decision by Russia to ratify the Kyoto Protocol in December 2004 was an important result of close contacts between the EU and the Russian authorities.

At the end of 2005 it was agreed to launch an *EU-Russia Environmental Dialogue* to implement the environmental priorities of the EU-Russia Common Economic Space road-map. The EU's Director-General Environment and the Russian Ministry for Natural Resources and Ecology led the dialogue, which covers: climate change, biodiversity and nature protection, water and marine issues, forestry law enforcement, cleaner production and pollution control, and environmental impact assessment/convergence of environmental policies. Expert EU-Russia Subgroups have been established in each of these areas¹⁹.

The EU-supported project Harmonization of Environmental Standards II, a successful example of cooperation, recommended an integrated environmental permitting and control system for industrial installations. The system would enhance implementation of The Russian Law on Technical Regulations and would be harmonized with European rules based on the concept of best available technology and adopted in compliance with Directive 96/61/EC concerning integrated pollution prevention and control (the IPPC Directive).

The EU and Russia also cooperate on environment in the context of the *Northern Dimension* (ND), which addresses the specific challenges and opportunities arising in Northwest Russia, the Baltic Sea and Arctic Sea region and aims to strengthen dialogue and cooperation between the EU, its member states and northern countries, including Russia, Norway and Iceland. The policy framework for the Northern Dimension (since 2007) was adopted by the November 2006 EU-Russia Summit. The renewed ND policy is a common policy of all ND parties, including – notably – Russia, and the regional expression in the north of the EU-Russia Common Space, with an emphasis on environment and health. The *Northern Dimension Environmental Partnership* (NDEP) is a partnership of the European Commission, several EU Member States, Russia, Norway and the International Financial Institutions (IFIs) (EBRD²⁰, EIB²¹, NIB²², World Bank) to catalyze and leverage environmental investments, with a focus on Northwest Russia. The European Commission has contributed €30 million towards non-nuclear projects under the NDEP Support Fund. NDEP grants have leveraged over €500 million in IFI loans and €1 billion in investments.

¹⁹ http://ec.europa.eu/environment/enlarg/russianis_en.htm

²⁰ European Bank for Reconstruction and Development.

²¹ European Investment Bank.

²² Nordic Investment Bank.

5.0 EFFECTIVENESS OF RECENT USAID PROGRAMS IN ENVIRONMENT

5.1 SCOPE OF CURRENT AND RECENT PROGRAMS

While USAID Russia does not currently have an Environmental Strategic Objective, it does have several projects which support environmental objectives, principally:

SUSTAINABLE NATURAL RESOURCE MANAGEMENT (2008-2013) Implemented through the US Forest Service (USFS)²³

US and Russian specialists are collaborating to improve natural resource management and biodiversity conservation through technical exchanges, training workshops, collaborative research, pilot projects and policy engagement.

Areas in which project activities are being conducted include:

- **Sustainable Forest Management** The promotion of multiple-use activities that balance economic, social, and environmental concerns. Areas of collaboration include fire management, illegal logging, inventory and monitoring, climate change, and forest certification.
- **Habitat Management and Conservation in the Russian Far East** Focal areas are habitat management, ecosystem restoration, and biodiversity conservation in three regions to improve conservation strategies for the Amur tiger and leopard, protect salmon habitats, and assess pressures on wildlife habitats.
- **Protected Area Management** USFS has been working with US universities, NGOs and Russian protected area managers to train personnel and build capacity.

COMMUNITY DEVELOPMENT SUPPORT PROGRAM (CDSP) (2006-2011) Implemented through the Fund for Sustainable Development, a Russian NGO

Though national in scope, CDSP focuses mainly on the Russian Far East and the North Caucasus, and it aims to enhance the role of civil society and participation in decision-making at the regional and municipal levels. Working in areas such as improvement of local resource management and local governance, public health and energy efficiency, the project contributes to improving social, economic and environmental living conditions. About 30 percent of investments are currently in the energy efficiency area, which gives the program a strong environmental character.

AMUR RIVER INITIATIVE (2007-2010)

Although formally part of CDSP, this activity has a different focus – to provide safe drinking water to villages along the Amur River, which are threatened by potential spills of toxic chemicals, such as the one in 2006 originating in China.

The above programs are focused largely on the Lake Baikal and Russian Far East regions.

²³ The program has been funded through a Participating Agency Service Agreement (Interagency agreement between USAID and USFS). USAID provided \$477,250 to USFS as an earmark and \$200,000 for illegal logging in 2010. The program match from USFS was \$225,000 in 2010.

The ECODIT Team also took note of several other USAID or other major USG initiatives with an environmental focus, namely:

- The Amur Tiger Initiative²⁴
- Lacey Act Outreach (Department of Justice);
- World Learning Focus on Results: Enhancing Capacity Across Sectors in Transition (FORECAST), which promotes exchange visits;
- USAID's Global Climate Change Program, which has awarded two grants already to Russian NGOs;
- US Environmental Protection Agency support to the Ventilation Air Methane at Russian Coal Mines Project (2011-2012); and
- Conservation support from the US Fish and Wildlife Service and National Park Service.

A more comprehensive listing is found in Attachment 1 of Part II.

5.2 OBSERVATIONS FROM THE FIELD

The ETOA is not an evaluation of current USAID programs but offers the following observations in the context of setting priorities for future USAID programs in similar areas.

SUSTAINABLE NATURAL RESOURCE MANAGEMENT

- Generally the program is focused on priority issues within the sector and on a manageable number of regions. It is built on a long period of partnership, which has gone through several phases and achieved considerable success.
- The USFS program has shown commendable flexibility in dealing with unforeseen issues like the fires of 2010, where it earned considerable praise for its rapid response.
- While it would not be appropriate for the USFS program to be influencing legislation like the Forest Code, it is making good use of opportunities to provide technical support to areas where that legislation needs strengthening, such as combating illegal logging.
- The essence of program design at present is annual consultations with the Russian counterparts and the selection of subjects of mutual interest, which gives the program somewhat of a short-term focus. The absence of a longer-term objective framework makes any sort of program evaluation difficult.
- Priorities should be kept under review. For example, forest regeneration techniques could perhaps be given less emphasis, and forest monitoring and inventory – which are woefully behind the times – could receive greater support. However, disappointing results in the past on inventories should be taken into account.
- The ETOA Team had some concern about the cost-effectiveness of the various tools USFS is using, which might indicate a need to move away from conferences and workshops in favor of electronic means of communication, coupled with more “hands on” technical assistance from experienced professionals.

²⁴ The Tiger Initiative has been funded from Assistance to Europe, Eurasia and Central Asia (AEECA) account of USAID. The total budget is \$396,000. AEECA account is based on annual Operational Plans (OPs) of USAID Missions including annual OP Russia.

COMMUNITY DEVELOPMENT SUPPORT PROGRAM AND AMUR RIVER INITIATIVE

These programs are considered together because they follow the same implementation mechanism.

The CDSP appears to be producing good results, which may be traced to:

- Careful identification of municipalities/ villages that are willing to work with the program, through a competitive process;
- Development of strong stakeholder partnerships involving local officials, NGOs, private sector and civil society, as needed at each project site;
- Assistance on project selection and formulation from a menu of options, while retaining the principle of free choice by the recipient;
- Efforts to generate adequate co-funding for each project;
- Support to resolving implementation problems, including legal hurdles, such as barriers to the municipality retaining cost savings generated by the project; and
- Efforts to disseminate good practice, such as a website and publications.

According to the Fund for Sustainable Development, its work to date has resulted in:

- Benefits to 500,000 people;
- Leveraging of \$1.50 in co-funding for every \$1.00 of USAID support and generation of at least \$5 million in follow-up projects; and
- Energy savings of 4 million kWh, implying reduced GHG emissions of 150,000 tons.

The ECODIT Team has some suggestions for any successor project, to improve its leverage and catalytic role even further:

1. Continue the present model but with more emphasis on planning tools like energy audits and engineering studies of water systems.
2. To expand the geographical reach of the program, build out from existing “centers of excellence” like Green House/ Khabarovsk and Environmental Service Center/ Luchegorsk.
3. Increase the emphasis on economic projects, which generate revenue and/or reduce costs; for example, by increasing the proportion of energy efficiency projects (without destroying the principle of local choice).
4. Increase the required ratio of co-financing for repeat grantees.
5. Explore opportunities for Russian private sector companies to participate.
6. Avoid financing the same kind of project for the same grantee; once a good project concept has been demonstrated, the municipality would be expected to find the financing to continue or replicate.

6.0 OPPORTUNITIES FOR USAID'S FUTURE PROGRAM

6.1 FROM ASSISTANCE TO PARTNERSHIP

From higher levels in the 1990s, the USAID program in Russia has stabilized at \$55 to \$60 million per year. This reflects Russia's less acute needs as compared to the early years of transition, as well as Russia's growing economic strength and foreign exchange reserves. The relationship is also maturing from one of *assistance* to one of *partnership*. Partnership implies, *inter alia*: a shift from US technical assistance to exchanges of information and expertise; each country potentially benefitting from working on problems of mutual interest; and, some reasonable sharing of program costs. The ETOA Team heard many requests from grassroots organizations for further USAID support of both kinds – assistance and partnership – but mostly for the former. This suggests that the transition to partnership should not be too abrupt.

The advent of the BPC provides an excellent opportunity for developing a new model of partnership. The overall process and each working group are co-chaired by the two countries and there is an expectation that each country will contribute to priority programs. Two early examples in the environment field – the *Black Carbon Initiative*²⁵ and project activities related to the *Coal Methane Utilization* proposal (see Annex E, Cases 1 and 3) – will be among the first to tackle important emerging issues.

An important context for future USAID assistance is that most other donors and international financial institutions are sharply reducing or even curtailing their programs in the Russian Federation. An important exception is the Global Environmental Facility (GEF), which has earmarked \$120 million for Russia over the next five years.²⁶ Of this total, some \$87 million is available for GCC; \$25 million for biodiversity conservation; and, \$8 million for combating desertification (see Attachment 1 for more details). This suggests that there would be substantial synergy and value added from close cooperation between the programs of USAID and GEF in areas of mutual interest.

6.2 THE RANGE OF PARTNERSHIP OPPORTUNITIES

Partnerships can be envisaged at a number of levels:

- Government to Government – the BPC itself is the prime example.
- Government agency to government agency – for instance, the US Forest Service program and smaller programs with US agencies, such as the Environmental Protection Agency, Fish and Wildlife Service, National Parks Service, Department of Energy, and the Department of Justice.
- Partnerships between regional and local governments – the potential exists for partnerships between Russian regions and US states, as well as sister cities (such as the US-Russian Far East Municipal Partnership Program). The ETOA Team noted much greater interest in cooperation at the regional and municipal levels than at the federal level.²⁷
- Scientific cooperation – examples date back decades and include a variety of instruments: joint research programs, exchange visits, conferences; and translation of research papers.

²⁵ Funded by the US Departments of Energy and Agriculture; USAID does currently provide any funding.

²⁶ From July 2010 to June 2014.

²⁷ In fact, the Team was unable to schedule official meetings with any Federal Ministry, although it did have useful informal meetings.

- NGO to NGO – with numerous environmental NGOs in each country, this would seem a natural fit; however, the Assessment Team saw only a couple of examples – the Tahoe-Baikal Institute and a partnership between the Great Baikal Trail and US Rotary Clubs. In a different category are international NGOs, like WWF or Greenpeace, where the national affiliate benefits greatly from being part of a larger network.
- Individual exchanges – the USDA “farmer to farmer” program was an earlier and popular example but one might question the cost-effectiveness of such programs, given travel costs and translation needs.
- Private sector – one of the most frequently expressed needs at the local level in Russia is for easier access to “green technology” from the US (or Western countries generally). Many stakeholders recognize that such technology often requires demonstration or adaptation to Russian conditions, as well as the development of servicing networks. However, trade fairs are not enough, as support is needed to: conduct demonstrations, adapt the technology to Russian conditions, develop servicing networks, and ease access to financing. Trade associations may play a role in this, and USAID could have a potential catalytic role in public-private partnerships as well.

6.3 CRITERIA FOR SETTING PRIORITIES

The Assessment Team suggests that the following list of selection criteria be refined and then used by USAID, in consultation with the Russian authorities, to select priorities for its environmental program:

- **Priority** for Russia, as indicated in Presidential decrees and statements, government policy papers and strategies, and the work program of the BPC;
- **Compatibility** with US Government criteria for various programs;
- Strong **catalytic** potential, including the possibility of leveraging additional funds and scaling the activity up beyond the initial pilot activities or sites;
- Potentially significant (and measurable) **impact on natural resources conservation and/or climate change mitigation or adaptation**, as well as on the economic and social well-being of the population;
- Support to **democracy**, governance, transparency, accountability, access to information, and gender equality objectives;
- Building on **past successes** and lessons learned, implying continuity with the past;
- Filling **gaps** and avoiding overlaps with other current/ planned Russian or donor programs
- Concepts that demonstrate a **partnership** approach
- **Costs** of the same order of magnitude as the funds likely to be available

In the context of a multitude of environmental and natural resources management issues (as described in Chapters 1 through 4), the Assessment Team saw many program opportunities that would meet most of the above criteria. In selecting the highest priority opportunities for USAID consideration, the Team gave particular weight to the criteria of **catalytic quality**, **impact on natural resources conservation**, and **building on past success**.

6.4 PROPOSED SCENARIOS

As the level of funding available for environmental programs in Russia in the next program period has not yet been determined, the Assessment Team envisages two scenarios:

- Base Case Scenario – assumes a funding level of about \$2.0 million per year for environmental activities and possibly \$1.0 million per year for related civil society activities.

The **objective** would be to deepen recent work on natural resource management, especially on biodiversity conservation, and make a serious start on addressing GCC issues, while also promoting democratization and governance objectives.

- Enhanced Case Scenario – assuming additional funding for GCC

The **objective** would be the same as the base case but with a greater emphasis on GCC.

The Team understands that USAID/Russia is leaning towards a program matrix with four major objectives, including **Environment** (including global issues) and **Civil Society** (including activities supporting citizen participation and improved governance). There is strong justification for an Environment Objective (with a focus on natural resources management), given USAID’s past and ongoing successful work in that area. It would give encouragement to those segments of Russian society combatting vested interests to promote sustainable development and would begin cooperation on GCC, which could become a major strand in US-Russian relations.

Main opportunities are summarized in the following table and described below:

TABLE 6.1 PRIMARY PROGRAM OPPORTUNITIES/RECOMMENDATIONS		
BASE CASE SCENARIO		ENHANCED CASE SCENARIO
ENVIRONMENT OBJECTIVE	CIVIL SOCIETY OBJECTIVE	ENVIRONMENT OBJECTIVE
1. Sustainable Natural Resource Management (USFS program)	4. Empowerment of Local Institutions 5. NGOs as Change Agents	6. Developing Capacity in Global Climate Change
2. Protected Area Management and Rural Livelihoods		
3. Collaborating to Meet the Challenge of Global Climate Change		

There should be considerable synergy between the environmental and civil society objectives, as the former rarely succeed without strong citizen participation and can pave the way for greater empowerment of local institutions and citizens. Projects aimed primarily at civil society and governance objectives can also benefit environmental protection, if thus designed. The placement of these program opportunities in one category should not be interpreted as excluding the other objective. The Team assumes continuation of other USAID programs with environmental objectives, such as the two Development Grant Program (DGP) projects, the Tiger Initiative and support to the Lacey Act enforcement.

6.5 BASE CASE PROGRAM PROPOSALS

OPPORTUNITY I: SUSTAINABLE NATURAL RESOURCE MANAGEMENT

The Assessment Team strongly endorses the continuation of the USFS support to Russia’s forestry sector. Such continuation would be in line with the criteria listed above, with particular emphasis on: its priority for Russia, conservation of natural resources, building on past successes, and partnership (see Chapter 5). As explained further in Part II, putting forest management on a more sustainable basis will be essential to the future of this major national

patrimony and the biodiversity it supports. Forests already play an important role in the mitigation of GCC and could play a bigger role in the future (through concepts such as Land-Use, Land-Use Change and Forestry (see section 1.1) and by providing a wide range of ecosystem services and alternative uses of land (for example, abandoned marginal farm land).

As detailed in Part II, Russia has made major structural changes to its forest sector, through the Forest Code of 2007, notably in decentralizing considerable responsibility for forest management to the regions and in allowing a role for the private sector in forest management, through concession agreements. While these changes were desirable in principle, they *have had serious adverse side effects. Issues simmering for some time (forest fire management, pest control, illegal logging, poor staffing, and corruption) have manifested themselves even further. The USFS has worked with its Russian partners at the federal and regional levels to address many of these issues and the need for continued support is unquestionable.*

The Team has some suggestions²⁸ for USFS that could make the program even more effective:

- Provide technical support to some of the needed legislative actions at both the federal and regional levels (understanding that the USFS cannot influence the further refinement of the Forest Code), since the major underlying issue is the inadequacy of the Forest Code.
- Program design should take place within an agreed-upon framework with longer-term objectives, performance indicators and periodic reviews of what was achieved.
- Focus on a few regions that typify the range of problems being addressed (and that link with other USAID programs), with additional emphasis on disseminating best practices to the rest of the country, through low-cost electronic means.
- Review its areas of support in light of changing needs. For example, forest regeneration techniques could perhaps be given less emphasis, and forest monitoring and inventory could receive greater support. However, disappointing results in the past on inventories should be taken into account. Recently enacted legal mechanisms (e.g., Federal Law No. 8 and related Governmental Decrees) provide a basis for increasing the public's awareness of the state of forest resources and the transparency of forest governance. However, forest cartographic data is still classified and solutions to this problem will require political will.
- Follow through with plans to get more involved in the issue of illegal logging and preventions of violations of the Lacey Act, linking it with the BPC working group on environment.
- Support for fire management should emphasize longer-term issues of fire management policies, responsibility of concession holders, numbers and training of personnel, and selection of equipment, in addition to limited emergency response actions.
- Examine the cost-effectiveness of various tools, which may indicate a need to use electronic means of communication and more "hands on" technical assistance from experienced professionals rather than conferences and workshops. The value of stationing a full-time program coordinator in country might be examined.
- If Opportunity 2 on protected area management is adopted, USFS's well-directed but modest support in this area may need to be coordinated and/or trimmed to avoid overlaps.

OPPORTUNITY 2: PROTECTED AREA MANAGEMENT AND RURAL LIVELIHOODS

Russia has a rich heritage of protected areas (PAs), which are vital to protect habitats and species, many of them threatened or endangered, as described in Part II. These areas also

²⁸ An earlier version of these comments was shared with USFS management, and this version takes into account their responses.

have significant potential for eco-tourism. Under the Soviet system, it was easy to set aside areas and prevent public access. Today, the PA system has to adapt to market forces – some legitimate, like the need for sustainable eco-tourism and recreation opportunities; others with inherent potential for irreversible environmental damage, such as pressures for exploitation²⁹, mining, infrastructure routes³⁰ and so on. At the same time, the powers of law enforcement services (militia, forest and park rangers, and hunting inspectors) need strengthening.

From its rapid assessment of even the limited number of PAs visited, the ETOA Team can see that the main threats to PA conservation – and in some cases their existence as unique resource areas and habitats supporting significant flora and fauna biodiversity – are: (a) inefficient policy; (b) conflicts in land ownership; and, (c) the lack of adequate enforceable standard management practices.

Objective: to support efforts by the government to modernize its policies for PAs and to introduce more effective management practices, reflecting international experience. While meeting all the criteria in Section 6.3, this opportunity could: be particularly catalytic, conserve natural resources, build on past successes, fill gaps and present partnership possibilities.

The Team suggests the following elements be considered in the design of such a program³¹:

REVIEW PA SYSTEM DESIGN The PA system does not provide protection for all endangered species. Earlier reviews on this subject need to be assessed, creation of additional PAs should be undertaken, as well as possibly changing the classification or zoning of existing areas.

HANDS-ON, MANAGEMENT BY OBJECTIVE, PLANNING IN SELECTED PROTECTED AREAS³²

Pressures on PAs are developing rapidly, and planning needs to be strategic, participatory, and more transparent and objective, taking into account the needs of new stakeholders, such as local administrations and adjacent populations.

DEVELOP VIABLE MANAGEMENT ZONES The use of zoning as a management tool is obviously known by PA staff but its usefulness is not fully appreciated and actual implementation is not widespread. Experienced PA planners and specialists in conflict resolution are required to help with the initial fine-tuning of boundaries, action-planning and conflict resolution

IMPROVE LOCAL LIVELIHOODS This should be accomplished through action planning linked to strategic tourism development, ecotourism infrastructure, and environmental education. Considerable sums of money have been earmarked for use in PAs throughout Russia for the next three years, but the Assessment Team found little evidence of any strategic planning associated with these funds. They are tied directly to developing ecotourism infrastructure and environmental education at a few selected PAs and not for management plans, law enforcement or other PA needs. Moreover, regular operational funding for PAs has been substantially cut in 2011. The Team suggests that a more strategic approach be developed, which balances conservation, education, tourism and other needs. It further suggests that a pilot program to assist villages in or adjacent to PAs be implemented. Using a model similar to CDSP, such a program would provide grants for infrastructure, such as drinking water or energy efficiency, while also supporting alternative income generation.

²⁹ Such as draft legislation before the Duma, to allow tourism infrastructure within zapovedniks.

³⁰ Such as the proposal for a highway through a valuable forest near Moscow or the proposal, now dropped, to build a pipeline across Lake Baikal.

³¹ See Chapter 14 for a more detailed description.

³² Regional priorities are described in Section 6.8. With limited funding, selection of priorities will be inevitable, implying that some endangered species may not benefit, except through national policy components. One example is the *Saiga* antelope of the steppe regions.

RESOLVE GOVERNANCE CONFLICTS RELATED TO LAND USE AND LOCAL TOURISM DEVELOPMENT

Conflicts can arise from many sources: rights of indigenous peoples; jurisdictional disputes between the federal, regional and municipal governments; unclear or un-demarcated PA boundaries; and the underlying conflict between conservation and human use objectives. Many of these should be resolved by participatory and conflict-resolution methods rather than reliance on the courts, but decision-makers have little experience in such methods.

IMPROVE TRANSBOUNDARY COOPERATION LINKED TO PROTECTED AREA MANAGEMENT

There are numerous protected areas within the Russian Federation that share borders with other countries. Transboundary cooperation in most of these areas is good but deserves additional support, with the ultimate goal of joint planning of conservation measures. Extensive international experience could be utilized in these situations.

IMPROVE DATABASE MANAGEMENT AND LINKAGES WITHIN THE PROTECTED AREA SYSTEM

While a lot of monitoring data is routinely collected in PAs, there is little evidence of its being systematically analyzed as a decision support system and to disseminate best practices.

Work in the above areas should be closely coordinated with ongoing GEF projects in the biodiversity area (see Attachment 1 of Part II).

OPPORTUNITY 3: COLLABORATING TO MEET THE CHALLENGE OF GLOBAL CLIMATE CHANGE

A specific feature of the Russian climate policy is a significant gap between advanced fundamental science on climate change and limited understanding of the issue by the general public and political elite. Narrowing the gap is the challenge for the Russian leadership, as is emphasized in the Climate Doctrine of the Russian Federation, and it also provides an opportunity for international development agencies, including USAID. The new projects under the USAID Global Climate Change Program (see section 1.4) are important initiatives in entering into this new thematic area.

Objective: to facilitate the exchange of information on GCC, so as to better inform the general public and political decision-makers of the nature, severity and urgency of the threats and to stimulate action on mitigation and adaptation measures. Among the criteria listed in Section 6.3, this opportunity scores very well on the following: priority for Russia, catalytic potential, impact on GCC mitigation or adaptation, filling of gaps, and partnership. The ETOA Team suggests two key elements: Linking People for Awareness Raising; and, a GCC Clearing House.

LINKING PEOPLE FOR AWARENESS RAISING ON GCC AND EE

The US has traditionally had strong mechanisms of public awareness raising and public participation in environmental policy development³³. Therefore, horizontal collaboration on GCC awareness-raising between US and Russian institutions, communities and individuals could be one of the first priorities for the new era of partnership. The ETOA Team suggests the following activities for consideration:

- Create a special program or a window for joint GCC initiatives of US and Russian organizations in implementing practical activities and public awareness on climate change mitigation and adaptation – sustainable forest management and nature protected areas would be priority targeted sectors for participation in the program.
- Engage NGOs and other stakeholders (NGO-to-NGO cooperation) in support of ongoing or proposed key initiatives under the BPC working groups.

³³ Although it could be noted that the US has not done particularly well on GCC to date.

- Support for dissemination of EE best practices through the existing USAID-REA partnership in the areas of energy savings reinvestment, smart grids, or building the capacity of ESCOs.
- Cooperation and information sharing with GEF projects related to GCC.

GCC CLEARING HOUSE ON MITIGATION AND ADAPTATION

The clearing house concept promotes the advertising, discovery, access, dissemination and use of information and data held by numerous organizations using the decentralized capabilities of the Internet. In its simplest definition, a clearing house can be viewed as a 'network of networks'.

The Security Council of the Russian Federation (March, 2010) decided that a national climate change center should be created in Russia. The concept of the Center is not completed yet; apparently, the Voeikova Main Geophysical Observatory will host the central node and coordinate cooperation of other participating organizations. It is open to cooperation with the US in establishing a GCC Clearing House under the National Climate Change Center. In early 2010, the US National Oceanographic and Aeronautical Agency (NOAA) announced the intention to create a Climate Service line office dedicated to bringing together the agency's strong climate science and service delivery capabilities. It could be rewarding for USAID to initiate long-term cooperation to develop capacity in the Russian Federation and the US to provide public access to up-to-date climate science information. The following activities are suggested for further consideration under the GCC Clearing House concept:

- Information collection and dissemination on methodology for risk assessment and damage calculations from fires caused by droughts in the forests and peat bogs, and on adaptation actions in most vulnerable regions;
- Information collection and dissemination on protection and improving the quality of reservoirs and sinks of greenhouse gases, promotion of sustainable forest management practices, afforestation and reforestation;
- Exchange of information on models for long-term forecast of greenhouse gas emissions in the Russian Federation;
- Ensuring information exchange between US and Russian agencies in the area of black carbon emissions observations and their influence on climate change; and
- Developing professional training programs and skills development on dissemination of information in the area of climate change.

Most of these activities could be suggested for government agency-to-government agency partnership. Roshydromet and its institutes are key potential partners from Russia's side, and academic institutes and universities could also be involved in implementation of the proposal.

OPPORTUNITY 4: EMPOWERMENT OF LOCAL INSTITUTIONS

This program would aim to strengthen local governments and other local institutions, through participatory planning and implementation of small investment projects with economic and environmental benefits. It could follow an implementation model similar to CDSP (described in section 5.2) but with greater emphasis on economic/financial payoffs, important because of the bankrupt status of many of the municipalities, as well as environmental and GCC benefits. Projects could either generate revenues or result in cost savings (with an agreement that such savings can be retained by the local government), and typically would be in the communal or "budget" sector. Provisions favoring projects that also generate environmental benefits would be appropriate. Examples of the latter would include clean drinking water, recycling of solid waste, or energy efficiency.

While it might be going too far to have this program focus exclusively on energy efficiency, experience shows that there is considerable interest at the local level in reducing energy costs

using simple, available energy conservation technology like solar panels, insulation, improved windows, control of central heat and efficient lighting. While a modestly-funded USAID program can have only a limited direct effect on municipal finances, pollution reduction and GCC mitigation, the demonstration effect can be considerable. Among the criteria set out in Section 6.3, this concept would meet the following criteria in particular: priority for Russia; catalytic potential; impact on climate change mitigation; support to democracy and governance; building on past successes; and partnership.

Section 5.2 also contains some suggestions for the future use of the model developed under CDSP. The Empowerment of Local Institutions program opportunity could explore the following:

- Expand the geographic reach of the program and build out from existing “centers of excellence” (like Green House/ Khabarovsk and Environmental Service Center/ Luchegorsk);
- Increase the ratio of co-financing for repeat grantees; and
- Explore opportunities for Russian private sector companies to participate.

The proposed program should be closely linked with other USAID projects under the Civil Society objective in the same geographical area.

OPPORTUNITY 5: NGOS AS CHANGE AGENTS

Objective: *to foster a community of self-reliant, sustainable NGOs³⁴ and to develop their capacity in promoting public awareness.* Two components (A and B) are proposed, which could be implemented as one package or split into two, depending on programming and budgetary considerations. Among the criteria of Section 6.3, this opportunity particularly shows: catalytic potential; support to democracy, governance, transparency, access to information and gender equality; building on past successes; filling of gaps; and, partnership.

NATIONAL ENVIRONMENT AND GCC AWARENESS PROGRAM

Objective: To improve public awareness and mobilize opinion on the issues of environment and GCC as key elements of national sustainable development.

Scale and Location: Information campaign in selected pilot regions (about three regions most vulnerable to potential climate change or with high levels of environmental degradation), with dissemination at the national level.

Activities: Awareness; facilitating translation of GCC scientific findings and environment into language understandable by a broad audience, especially decision-makers (see also Opportunity 3); information campaigns on the environment and GCC; elaboration of study courses for high schools and universities; support of an environment and GCC web portal; establishing partnerships with government, businesses and academia.

Linkages: Linked primarily to governance and civil society priority areas, could incorporate CDSP experience and be linked to USG Black Carbon, forestry, biodiversity and tiger programs.

STRENGTHEN NGOS TO INCREASE MEMBERSHIP BASE AND FINANCIAL STABILITY

Objective: To increase financial stability and independence of environmental NGOs from targeted program grants.

Scale and location: National training and information campaign, with special emphasis on priority areas of Baikal and RFE.

³⁴ Indigenous groups might also be included.

Activities: Training in fundraising, creating membership networks, NGO marketing and program administration, creation of donor partnerships, support in using web portals, modern media and exchange programs, networking existing NGOs with governments and businesses, providing audit and consulting services to improve administration and financial efficiency of the NGOs.

Linkages: Linked primarily to governance and civil society priority areas and to all USAID programs implemented through NGOs. The activity also relates to the existing USAID Global Development Alliance (GDA) mechanism³⁵.

6.6 ENHANCED CASE PROPOSAL

OPPORTUNITY 6: DEVELOPING CAPACITY IN GLOBAL CLIMATE CHANGE

If additional funding is available to address GCC, it would be possible to build on the foundational work of Opportunity 3 with the **objective** of going beyond information exchange and awareness-raising to include building capacity for GCC mitigation and adaptation. Selection criteria emphasized would be the same as those of Proposal 3 - priority for Russia, catalytic potential, impact on GCC mitigation or adaptation, filling of gaps and partnership.

SUPPORT THE GCC CLEARING HOUSE IN ADDITIONAL AREAS RELEVANT TO USAID PRIORITIES

- Build capacity for adaptation strategy in forestry, agriculture, and water management;
- Increase awareness among citizens of the danger of burning agricultural residues; collecting and sharing information on practical alternatives and outreach to farmers – through the development of courses and training modules;
- Develop capacity regarding climate risk management methodologies; arrange pilot studies of mutual interest (for example, on impacts of GCC on river flows and flooding in the RFE);
- “Translate” scientific knowledge on GCC into language that decision-makers and civil society can understand; develop mass-media products and their dissemination.

NGO CAPACITY STRENGTHENING ON GCC

- Support to expert communities, non-governmental research centers and “think tanks” on GCC mitigation and adaptation. Examples include: the Institute of Sustainable Development under the Civic Chamber (it maintains a network of experts at the federal level and in the regions), moderated expert communities on GCC, and professional and social networks.
- Support to collaboration between US NGOs and business associations with the Social Forum on Climate Change and Energy Efficiency, established in 2003 by Russian NGOs with the participation of the Environmental Defense Fund (a US NGO) to promote public support to Russian ratification of the Kyoto Protocol.

The key outcomes and indicators of capacity strengthening would be a number of scientifically sound publications in the mass media, targeted brochures, newsletters, seminars, workshops and conferences of distinguished experts.

CO-FINANCING THE UNEP/GEF PILOT PROJECT ON BLACK CARBON

- Support to US experts’ participation in the GEF project design, ensuring consistency with the Department of Energy/ US Department of Agriculture Black Carbon Initiative.
- Direct technical and financial support to preparation and implementation of the Pilot Project on Black Carbon under the envisaged GEF-Russian Partnership on the Arctic Agenda 2020.

³⁵ See http://www.usaid.gov/our_work/global_partnerships/gda/ for more information. “GDAs mobilize the ideas, efforts and resources of governments, businesses and civil society to stimulate economic growth, develop businesses and workforces, address health and environmental issues, and expand access to education and technology.”

CAPACITY DEVELOPMENT ON CARBON MARKET MECHANISMS:

- Exchange of information and organization of joint conferences on carbon market instruments development and use. Special attention could be given to transferring the experience of US sub-national GHGs cap-and trade initiatives to interested Russian regions.
- Joint research project on assessing prospects for carbon offsets generation in the forest and agricultural sectors, with a focus on developing methodologies on Land-Use, Land-Use Change and Forestry³⁶ projects.

6.7 ADDITIONAL IDEAS

The following ideas are presented for consideration at a future time or if insurmountable obstacles block the above major proposals.

A. LAKE BAIKAL

The Lake Baikal Region holds 20 percent of world's fresh water and is a UNESCO World Heritage Site. Annex E, Case Study 6, has a more detailed account of the region's environmental management, and some ideas of possible future USAID engagement in the area include: continued capacity-building for NGOs; science partnerships, especially in topics where significant distrust exists locally and engagement of international scientists could increase trust (e.g. environmental monitoring); a more ambitious scientific partnership in the form of a major new institute (Lake Baikal Institute) to coordinate and/or carry out research programs on the lake and its surroundings; and alternative economic development and addressing past environmental liabilities (PELS) of the Baikalsk Pulp and Paper Plant.

B. BLACK CARBON

There is a need for wider information dissemination on Black Carbon (see section 2.2) among Russian experts, policy makers and the general public. USAID activities should be based on the currently approved USDA/ DOE Black Carbon Initiative and implemented through other USG agencies. For example, the project *Quantifying and mitigating the impact of forest fires and open burning* might contribute to solving this problem through mechanisms such as: ensuring information exchange between US and Russian monitoring agencies in the areas of black carbon emission observations and Best Available Technologies that will reduce black carbon emissions from oil, energy, and transport enterprises. Other activities might include: facilitation of more effective cooperation between the US Black Carbon Initiative and the GEF-Russian Federation Partnership on the Arctic Agenda 2020; and pilot projects to inform black carbon mitigation efforts. (See Case Study in Annex E for more information.)

C. PERMAFROST MELTING

While there exists a general understanding of this problem, Russia lacks: a detailed assessment of potential economic losses; a plan of action in including a long-term strategy for adapting infrastructure to climate change; consideration by Russian permafrost construction specialists of climate change as a factor able to cause large-scale permafrost changes; and regulations for the construction and operation of buildings and facilities in permafrost areas that consider changes in climate. USAID could get involved this issue by: supporting exchange of scientific information; translating existing information in Russian for international audiences; holding conferences; and supporting energy efficiency programs and the Black Carbon Initiative, which could potentially slow down permafrost melting.

³⁶ Similar to the REDD concept in tropical areas (see Section 1.1).

D. COAL MINE METHANE AND COAL BED METHANE UTILIZATION

USAID could consider providing support to the new Coal Bed Methane Project (included in the plan of the BPC's Energy Working Group) through activities such as: business-to-business technological cooperation for recapture and utilization of coal mine methane; support to access financing for project implementation; participation in organizing a workshop on coal mine methane (CMM) prospects in Russia scheduled in June 2011 (in Kemerovo); and support for the preparation of new technological norms and standards relevant to CMM capture and utilization. USAID could focus its involvement on engaging non-governmental organizations and other stakeholders in dissemination of information about best practices for CMM and CBM projects in the USA, aiming to develop technical capacity in Russia on the issue.

E. PRIVATE SECTOR PARTNERSHIPS – developing mechanisms for the demonstration, adaptation and eventually local manufacture of green technology.

F. GREEN AGRICULTURE – a step towards a system of organic agriculture, by branding fruits and vegetables as pesticide free.

G. PUBLIC MONITORING OF WATER QUALITY – including bio-monitoring, possibly through high school students.

6.8 REGIONAL FOCUS AND PROGRAM MANAGEMENT ISSUES

While undoubtedly each of the Team's proposals would be welcomed in – and add value to – many of Russia's regions, the Team sees considerable value in maintaining the primary focus of the last few years on Eastern Siberia (Lake Baikal region) and the Russian Far East. Such a focus would build on past achievements and established institutional linkages, including other USAID civil society and governance programs. For biodiversity, these regions include many of the most important and threatened ecosystems and species (such as tiger, leopard and salmon), as well as the unique Lake Baikal habitat. As the programs develop, consideration could be given to judicious expansion into additional areas (such as polar bear habitat for PA management, or areas affected by permafrost melting for the GCC proposals). A broader geographical coverage could be considered for Opportunities 3, 4, 5 and 6, especially where there is scope to build on previous work in civil society and governance.

However, given the inevitably limited areal coverage of direct assistance, considerable emphasis needs to be placed on dissemination and scaling up, to influence other parts of the country with similar problems. A dissemination component is recommended for each of the above program opportunities.

With the present emphasis on partnership and the growing strength of the Russian economy, it will be appropriate to expect substantial co-financing. While the circumstances may vary between the proposed programs, a target of 1:1 would seem a reasonable possibility.

Given USAID/Russia's desire to maximize the cost-effectiveness of limited funding for environment, it should consider putting in place a strategic management system for each program taking into account that: each program should have clear objectives, performance indicators and expected outcomes; and each program should be evaluated against the above criteria (to the extent not already being done) both internally (program management plus USAID participation) every two years and externally at program completion.

6.9 CONSTRAINTS

As noted above, among the underlying causes of inadequate management of the environment in Russia is the legislative framework, which is often unclear, incomplete or overlapping, with conflicts between federal and regional levels. Such inadequacies are likely to hamper implementation of several of the above program opportunities; yet, the ability of USAID to

influence the strengthening of laws may be limited. The same can be said for governance issues – the corruption that permits illegal logging to flourish is a good example. USAID can have an indirect effect, however, by demonstrating best practices, which can later be extended through legislation if there is sufficient political will.

Political sensitivities could affect some of the proposals. Planning of joint PA activities with neighboring countries may be hampered by political differences in other spheres. The role of NGOs is not seen as benevolent by some in the Russian government, although NGOs have amply demonstrated their ability to implement programs at the grassroots level in USAID work.

6.10 RECOMMENDATIONS FOR THE RUSSIAN FEDERATION

While the foregoing sections have summarized the main opportunities with respect to USAID's planned program, we present here a few considerations for the Russian Federation that have emerged from our research described in preceding chapters. It should be kept in mind that this is by no means a full account of what needs to be done to improve environmental management in Russia; such a comprehensive analysis would be beyond the scope of this assignment.

A. A NEW CHALLENGE: ADDRESSING GLOBAL CLIMATE CHANGE AS WELL AS REMEDYING PAST NEGLECT

As Chapter 1 has indicated, Russia is not only a major contributor to GCC but is also likely to suffer major impacts – indeed, many such changes can already be observed, from the increase of summer droughts and forest fires, to the melting of the permafrost and the disappearance of arctic islands. This raises an important question: what priority should Russia give to GCC when its legacy of environmental problems from the past is still far from fully addressed? Chronic environmental mismanagement is perhaps the most dangerous holdover from the past, massively increasing vulnerability to even modest global warming. As with other countries in ECA region, Russia also bears the burden of poorly constructed, badly maintained, and aging infrastructure and housing. These are ill-suited to cope with storms, heat waves, or floods, let alone protect populations from the impacts of such extreme events (World Bank 2009a).

This assessment takes the view that, where impacts on human health and the economy are concerned, addressing current pollution and past environmental liabilities should be given top priority, while preparations are made for future GCC adaptation actions.

At the same time, GCC mitigation actions that have clear economic payoffs should be pursued. A prime example is improving energy efficiency – it is a “triple win”, with benefits for the economy, for the environment (in terms of lower pollution) and for GCC. The Assessment Team recommends that savings from any EE project be isolated and reinvested by the private sector, or at least a non-budgetary enterprise, like the contractor implementing the EE project, or the communal services enterprise, using the possibilities provided by Federal Law No 41.

The economic benefits of renewable energy are less clear at present, especially when subsidies on fossil fuels limit financial incentives, but the environmental and GCC benefits remain substantial. However, for isolated settlements, renewable energy does appear promising. For instance, in Baikalskiy Nature Reserve, the Team learned of a program there to install solar, wind and mini-hydro generators for the reserve's remote ranger stations.

However, a different calculus applies where natural resources are considered. Situations where GCC could cause irreversible harm, such as loss of ecosystems or species extinction, must be identified and addressed with great urgency. This subject is further explored in Part II.

B. IMPROVING ENVIRONMENTAL MONITORING

The general conclusion of all independent assessments is that the environmental monitoring system in Russia is fragmented, the institutions involved are not well integrated, and the deterioration of technical capacity has reduced the ability to monitor toxic substances and priority pollutants such as fine particulate matter. The degradation of Russia's ambient water and air monitoring systems in the 1990s has not only affected Russian environmental management programs but impacted global monitoring systems as well.

Key recommendations in this critical area include:

- Increase the number and representativeness of ambient air quality and water quality monitoring stations across the Russian Federation;
- Bolster the stations with good laboratories, and consider targeted outsourcing of services to private laboratories;
- Enhance quality control programs (include laboratory accreditation) to ensure accurate, reliable and consistent data;
- Link information management to decision-making; Consider which data – both core indices and those linked to economic and other sustainable development factors – are best representative of Federation-wide conditions so as to track trends in the environment; and
- Partner with civil society in areas such as biological monitoring.

The 2008 reorganization that placed environmental functions and sustainable use of natural resources under a single federal ministry – MNRE – offers opportunities for optimization, consolidation, and efficient integration of available capacity.

As was recommended in several independent reports, the Russian Government should attempt to ensure that all levels of monitoring rely on unified and efficient networks, similar to international network standards. The environmental monitoring system might focus on only the most significant pollutants and priority environmental challenges. Public disclosure of environmental monitoring information and public information dissemination should be strengthened. The Russian system should optimize environmental standards by benchmarking them to international standards to make them more practical and easy to monitor. A basic set of environmental standards should be defined, covering the types of air and water pollution that have the most significant impacts on human health and the environment.

C. ENVIRONMENTAL MANAGEMENT

Among the most urgent needs in environmental management are:

- Ratification of the UNECE37 Convention on Access to Information, Public Participation in Decision-making and Justice in Environmental Matters (Aarhus Convention).
- Reinstitution of the system of environmental impact assessment (environmental expertise) for new investment projects of all kinds (including forestry).
- Modernization of the systems for air and water pollution management by moving from a multitude of unenforceable limits to a best available technology approach.
- Overhauling the system of environmental fees and fines to ensure transparency and enforceability and to provide incentives to reduce emissions.

³⁷ United Nations Economic Commission for Europe.

ATTACHMENT 1: ENVIRONMENTAL ELEMENTS MATRIX

ELEMENT	GLOBAL CLIMATE CHANGE			
Sub-Element	International Agreements	Mitigation Actions	Adaptation Measures	Carbon Financing
Constraints	Russian Federation will not take part in the second period of the Kyoto commitments	Climate change mitigation is not considered a government priority. No special instruments for implementation of the national climate change policy.	Absence of adaptation strategies on federal, regional and local levels.	Delays in approving Joint Implementation rules. GIS is not introduced yet. Companies did not benefit from carbon financing as envisaged.
Underlying Causes	Successful implementation of the first period of the Kyoto Protocol	Draft Action Plan on Implementation of the Climate Doctrine has not been approved yet.	Lack of capacity to monitor and forecast climate change. Lack of a clear organizational system for developing and implementing adaptation strategies.	Lack of interest and political will
USG Interventions*	None	“Intensified and Sustainable Forest Management in Russia”	“Climate Change Adaptation and Mitigation Strategies in the Forest Sector of the Russian Regions of the UNESCO World Heritage and Biodiversity Centers”	None
Other Interventions	European Commission (EC) and other partners supported Russia’s implementation of the Kyoto Protocol.	WB /IFC study “Energy Efficiency in Russia: Untapped Reserves”; EC, European Bank for Reconstruction and Development (EBRD), and other donors supported several projects on capacity development of Russia’s participation in Kyoto Protocol flexible mechanisms.	Assessment Report on Climate Change and Its Consequences in the Russian Federation (2008); Pilot project for development of low carbon and climate-resilient territories in the Russian Arctic. (Murmansk oblast)	EC ,World Bank , EBRD, other donors supported several projects on capacity development in KP flexible mechanisms.
Enabling Conditions	Russia’s negotiation position is that the Kyoto Protocol should be replaced by a new agreement.	Linking and integration of climate change mitigation strategies in social-economic development; in particular, in programs on increased energy efficiency (EE).	Integrated climate strategies need to become an essential element of regional socio-economic development planning.	Government realized benefits of carbon market instruments and their role in EE improvements.
Lessons Learned	Strategic political considerations prevail over economic advantages for Russian companies.	Without comprehensive energy reform program, Russia cannot realize its vast energy saving potential.	Institutional capacity is one of the key conditions for implementing adaptation strategies.	Economic advantages cannot be achieved without political will.
Future Directions	New global climate change agreement should be based on broad participation of all developed and advanced developing countries.	Implementation of the legislation on energy efficiency; Implementation of targeted program at federal, regional and municipal levels; Introduction of National GHGs cap-and-trade system; Approval of the Action Plan on Implementation of the Climate Doctrine; Establishment of the National Center on Climate Change	Approval of the Action Plan on Implementation of the Climate Doctrine; Establishment of the National Center on Climate Change	Introducing national GHGs cap-and-trade system, which should be compatible with international carbon market systems

*USG (United States Government) interventions include those undertaken both previously and currently.

ELEMENT	URBAN ENVIRONMENTAL QUALITY		
Sub-Element	Air Quality	Water Quality	Solid Waste Management
Constraints	Poor air quality in most cities. Slightly improving trend, except for vehicle pollution.	Unsatisfactory in the most populated and industrialized regions. Substantial impact on aquatic ecosystems.	Inadequate disposal of most industrial/ hazardous and municipal wastes. Limited recycling. Past environmental liabilities (PEL) from abandoned plants and mines not systematically addressed.
Underlying Causes	Soviet legacy of obsolete heavy industry. Lack of awareness of health impacts. Incomplete monitoring system. Lack of economic incentives. Lack of political will.	Soviet legacy of obsolete, heavy industry. Lack of economic incentives and insufficient public investment. Lack of political will.	Soviet legacy of obsolete, heavy industry. Lack of economic incentives and insufficient public investment. Lack of political will.
USG Interventions*	None	Village water supplies under the Amur River initiative	None
Other Interventions	Earlier World Bank project. Other donor projects. Recent efforts to reform laws and improve incentives.	Some donor projects. Some government investment in new waste-water treatment plants (especially in Vladivostok) and rehabilitation of existing ones but not yet sufficient.	Some donor projects. Some government investment in modern landfills (especially in Vladivostok). PEL program under development
Enabling Conditions	Public awareness Political will	Public awareness Political will	Public awareness Political will
Lessons Learned	Little progress in last ten years because of the power of the business lobby.	Local governments have little financial or managerial capacity. Strong guidance necessary. NGOs have demonstrated useful models for small-scale projects.	Inadequate compliance by industries. High cost of hazardous waste disposal and PELs. Local governments have little financial or managerial capacity.
Future Directions	Gradual tightening of standards and enforcement, together with economic incentives (such as cap and trade) should yield improvements, as they have in the West.	Gradual progress likely as priorities shift and local governments develop capacity and federal level assumes a facilitating role.	Gradual progress likely as priorities shift and local governments develop capacity and federal level assumes a facilitating role. May progress faster because of high visibility of waste dumps.

*USG (United States Government) interventions include those undertaken both previously and currently.

ELEMENT	RURAL ENVIRONMENTAL QUALITY			
Sub-Element	Land Management	Agriculture	Water Resources Management	Marine Environment
Constraints	Land ownership complex and often unclear Cadastre not up to date Leasing widespread for agriculture and forestry	Impacts from fertilizer, pesticides and intensive livestock production reduced from Soviet period. Little official support for sustainable practices or organic farming	2006 Water Code provides for basin management but limited progress to date.	Quality varies from near pristine to heavily impacted by pollution and inadequate management of fisheries.
Underlying Causes	Transition from Soviet system not yet complete	Previous highly centralized system has not yet been replaced with a decentralized system for advising private farmers. Limited public awareness of impacts	Without central planning, competing uses must be accommodated. Water quality a growing issue	“Tragedy of the Commons” issues – priority on short-term profits
USG Interventions*	None but work in forestry and PAs has been affected by land ownership issues.	None	None	None
Other Interventions	World Bank support for initial transition period	Some earlier World Bank work in livestock production Other donor projects	None known	None known
Enabling Conditions	Clarity of ownership is a pre-condition for sustainable management of land.	Public awareness Political will Pressure from trading partners	Good legal provisions exist but may need greater political will to become effective.	Public awareness Political will Pressure from other riparians
Lessons Learned	None identified	With the rush to develop oil and mineral resources, agriculture has been relatively neglected.	None identified	Using the sea as a dump has eventual repercussions. Marine resources must be managed for the long term.
Future Directions	Likely push for full privatization in agriculture and possibly forestry. Legislation and enforcement needs to catch up with economic realities.	As public awareness builds, action is likely on issues like: integrated pest management; nutrient management; minimum tillage; organic farming and genetically modified organisms.	Basin level planning and management will become more important as impacts of climate change (droughts, floods) are felt.	New threats from GCC will become apparent, especially in the Arctic. Fisheries will slowly become more sustainable.

ELEMENT	DISASTER/EMERGENCY PREPAREDNESS	
Sub-Element	Forest Fires	Other
Constraints	Government unprepared – in policies, management practices, equipment and manpower – for the fires of 2010.	Heat and cold waves, droughts and floods likely to be more prevalent with GCC
Underlying Causes	Unintended consequences of the Forest Code of 2007, and its emphasis on decentralization	Public – and official – awareness not high of the likely impacts of GCC
USG Interventions*	Short and long-term support through USFS	None
Other Interven.	Series of World Bank projects	None known
Enabling Conditions	Public awareness now high and leading to substantial revisions of the forest Code	Public awareness Political will
Lessons Learned	Decentralization and privatization needs to be accompanied by continued government support in key areas like fire management.	Action is more likely after a disaster than before it.
Future Directions	Assuming public interest remains high, Russia should be able to move fairly quickly to a modern and effective fire prevention and management function.	Increasingly obvious impacts from GCC will spur development of monitoring, forecasting, prevention, mitigation and relief mechanisms.

*USG (United States Government) interventions include those undertaken both previously and currently.

ELEMENT	FOREST MANAGEMENT				
Sub-Element	Sustainability	Governance	Export	Biodiversity Impacts	GCC Impacts
Constraints	Weak forest code; poor & outdated forest inventory; inadequate budget for management and enforcement	Inadequate management plans/planning With decentralization, lack of adequate budgets, management/monitoring staff	Significant amounts (+30%) of total timber harvested illegally cut/transported especially in southern Siberia and the RFE	Especially threatening to some eco-regions (e.g. RFE) where high conservation value forests are being rapidly diminished	Carbon released from harvesting operations
Underlying Causes	High turnover of personnel, lack of political will at top echelons	Low morale, lack of forward planning, regional budgets not in line with value of resource	Lack of political will, corrupt companies and public officials	Lack of information, weak and nonexistent monitoring and enforcement	Lack of a government strategy to monitor and enforce
USG Interventions*	Annual USFS plan with Forestry Agency with intermittent TA for sustainable forest management and fire management, USAID Global grants to NGOs for Sustainable Forest Management	Minor USFS workshops/exchanges	US Department of Justice workshops related to the Lacey Act	USFS and USAID assistance for Amur Tiger initiatives, Amur leopard, salmon habitat protection, working with NGOs; some education and awareness	DGP projects, fire management and BPC interest in black carbon
Other Interventions	UNDP/GEF, World Bank, WWF	UNDP/GEF	WWF, Phoenix Fund, Global Forest Watch, WRI have/have had inputs with assistance from FLEG activities and some forest industry (IKEA)	UNDP/GEF; UNEP/GEF	None known
Enabling Conditions	Improved Forest Code, allowance for external partnerships with international donors	Better/more informed regional governments prepared (with proper budgets) to accept management responsibilities	Stronger Forest Code, full enforcement, political will, greater knowledge of product origin and chain of custody by importing countries	Greater public awareness; better/more thorough management plans especially at the regional level	Greater awareness on role of forests in mitigating climate change
Lessons Learned	Need a clear, unambiguous forest law; need better prepared regional governments for their management responsibilities; value added of public (and NGO) participation	Need more forward planning, perhaps with a phased approach for regional governments; needs assessment for regional forest policies and laws not covered by national authority with clear lines of jurisdiction	Need greater awareness by global markets about source/origin of products; Greater awareness of EU FLEG and US Lacey Act effects	Socioeconomic pressures and infringement on high value conservation forests; improved and implemented management plans can help mitigate threats	Greater awareness of forest fires and black carbon connections
Future Directions	New forest inventory by region; revamp and enforcement of Forest Code	More regional enforcement and better policies that are functional, transparent, accountable and have public input/participation	Commitment to enforcement; certification and chain of custody regulation	Improve the linkages between management plans, local livelihoods, protection and enforcement	Increase emphasis on fire/black carbon connections; avoided deforestation benefits; introduction of Land-Use, Land-Use Change and Forestry

*USG (United States Government) interventions include those undertaken both previously and currently.

ELEMENT	BIODIVERSITY MANAGEMENT				
Sub-Element	Legislation and Institutions	Protected Areas	Other Areas	Reduction of Threats	GCC Impacts
Constraints	No definitive management planning policy that encompasses global standards	Paucity of PA planning that meets global standards; weak budgets and insufficient enforcement staff	Paucity of regional planning that meets global standards; weak budgets and enforcement staff; regional plans, if any, often do not account for value of biodiversity within their boundaries	Lack of coordination and knowledge especially at regional level; no comprehensive strategy/actions plans to address threats in/outside of PAs	No strategic links on planning between GCC and biodiversity
Underlying Causes	Lack of coordination and budgets between national institutions and regional implementers; lack of political will	Weak budgets, political will and little adequately trained manpower	Lack of knowledge, political will and trained staff	Lack of planning, manpower and budgets; alternative livelihood choices for local people are few/non-existent	Lack of political will and mechanism to provide leadership to address the issues
USG Interventions*	Some USFS assistance on policy and law enforcement issues	USFS, USFWS, USNPS training and exchanges for PA staff	USFS work with ecotourism, biodiversity awareness, working with local communities especially in southern Siberia and the RFE	USAID grants to NGOs working to reduce threats to big cats and habitat in RFE; USFS with NGO on salmon habitat protection and awareness	NOAA research on animal behavior and migration related to temperature changes
Other Interventions	UNDP/GEF on biodiversity laws and policy	UNDP/GEF biodiversity conservation project; strengthening PA staff capabilities	UNDP/GEF strengthening PA system; working to safeguard critical wetlands and ecosystems	UNDP/GEF innovative and adaptive practices to mitigate/prevent threats to biodiversity	UNDP/GEF assessment of climate change risks for vulnerable steppe ecosystems
Enabling Conditions	Policies that emphasize planning and transparent monitoring and enforcement	Adequate budgets for monitoring and enforcement; trained management planning staff	Local governments engaged in planning; adequate budgets for monitoring and enforcement	Transparent/implement-able monitoring strategy and enforcement staff	More knowledge about impacts on species; public awareness
Lessons Learned	Raising public awareness does impact political will	Knowledgeable trained staff have better enforcement and monitoring with positive links to local community	Protecting habitats is a lot cheaper than trying to rehabilitate them	Involve local populations, address livelihood issues	Good biodiversity conservation is a positive element in mitigating climate change impacts
Future Directions	Paying greater attention to successes at the local level to help formulate and drive successful and implementable policies	Planning, planning, planning; working with local governments, civil society organizations and the local population	Planning, planning, planning; working with local governments, civil society organizations and the local population	Greater emphasis on addressing local livelihoods	Greater awareness of the direct links between biodiversity conservation and climate change mitigation

*USG (United States Government) interventions include those undertaken both previously and currently.

ELEMENT	OTHER ISSUES			
	Coal Bed Methane	Coal Mine Methane	Associated Gas	Gas Pipeline Leakage
Constraints	Russia has substantial CBM resources but little usage to date.	Russia has substantial CMM resources but little usage to date.	Three-quarters of gas associated with oil extraction is flared.	Fugitive emissions in Russia are substantial.
Underlying Causes	Insufficient economic incentives. Limited technical knowledge.	Insufficient economic incentives. Limited technical knowledge. Limited concern over mine safety issues.	Lack of investment in needed infrastructure. Economic barriers.	Lack of maintenance and investment in infrastructure renewal.
USG Interventions*	New EPA Coalbed Outreach Program project for 2011-12. BPC has flagged the issue.	UNECE project with support from EPA.	None	None
Other Interventions	Multilateral methane to Markets Partnership covers 29 countries.	Multilateral methane to Markets Partnership covers 29 countries. UNDP/ GEF Project. EU project.	Government resolution. Enterprise investments. World Bank JI Project.	Regional Environmental Center/ Global Opportunities Fund project. 30 projects by Rozgazification.
Enabling Conditions	Reduction of subsidies to other methane sources. Demonstration of cost-effective extraction techniques.	Demonstration of cost-effective extraction techniques. Public concern to improve mine safety.	Public awareness. Political will/ strengthened regulations Economic incentives.	Public awareness. Political will/ strengthened regulations. Economic incentives.
Lessons Learned	Relatively little experience to date.	Relatively little experience to date.	None identified.	None identified.
Future Directions	Enhancements to the EPA project, through NGOs and dissemination of best practices.	None foreseen.	No obvious role for USAID.	No obvious role for USAID.

*USG (United States Government) interventions include those undertaken both previously and currently.

ELEMENT	OTHER ISSUES (CONTINUED)		
Sub-Element	Black Carbon	Invasive Species	Lake Baikal
Constraints	Deposition of carbon particles is decreasing albedo and increasing melting of snow and ice, especially in the Arctic.	Globalization has encouraged the spread of invasive organisms of all kinds	Contains 20 percent of the world’s unfrozen freshwater. World Heritage Site. Endemic species. Relatively unpolluted.
Underlying Causes	Forest fires, burning of crop residues, and local combustion sources, especially diesel.	GCC could exacerbate the problem.	Threats from urbanization, air pollution, industry (paper plant), unsustainable tourism, and degradation of the watershed, including transboundary impacts.
USG Interventions*	Two-year, multi-agency (USDA, EPA, DOE, NOAA) initiative.	None	The region has been a focal area for several programs, most notably that of USFS. Promotion of NGOs has been a feature.
Other Interventions	The Arctic Council and BPC have flagged the issue. Some NGO initiatives.	Regulations, including border inspections and quarantine.	UNESCO recognition. Government policies and coordination mechanism. World Bank project. Many NGO initiatives. Inconsistent actions on paper plant and its PELs.
Enabling Conditions	Public awareness. Political will. Recognition by the forestry and agriculture sectors of their contributions to the problem.	Improved funding for enforcement. Continued research, including natural predators.	Public awareness (already quite high). Political will. Provision of alternative employment opportunities. Regional scale planning of tourism and natural resources conservation.
Lessons Learned	Relatively little experience to date.	Early interventions more likely to succeed.	Pressure from NGO, local and international) can be effective. Piecemeal approaches are not optimal.
Future Directions	Present initiative will no doubt point the way to future priorities and design of full-scale programs.	USFS program could place more emphasis on combating forest pests and diseases.	Region should continue to be a focus for USAID, through USFS and new biodiversity conservation proposal. Possible additional roles in PELs, alternative employment, and research coordination might be considered.

*USG (United States Government) interventions include those undertaken both previously and currently.

PART II

BIODIVERSITY ANALYSIS

EXECUTIVE SUMMARY

Russian ecosystems are home to diverse and often endemic species that are rare or extinct in other parts of the world, such as the **Amur tiger, Himalayan, brown and polar bears, Caucasian tur (wild goat), the Baikal seal, the Sakhalin taimen (a salmonoid fish), and snow leopards**. High biodiversity and speciation are particularly found in the **northern Caucasus, the steppe and steppe forests** of southern Siberia, the mixed-forests of the southern **Russian Far East**, and the **Chukotsk and Kamchatka peninsulas**. Russia harbors more than 11,400 species of vascular plants; 269 species of mammals; 528 breeding bird species; 32 species of amphibians; 94 reptiles; 290 freshwater fish species; and tens of thousands of invertebrates, fungi, and protozoa. **Eight terrestrial biomes** – or major ecological communities – are represented and within each biome are many **ecosystems**, such as **grasslands, forests, lakes, rivers, and marshlands**.

Legislative changes and policies governing human use of and impacts on these resources significantly impact the sustainability of forests and biological diversity. The introduction of the new Forest Code in 2007 resulted in significant **restructuring of the forest management and governance systems**, and a drastic decrease of effectiveness in preventing illegal logging, in forest law enforcement and access to forest resources by local citizens. Also, **dramatic cuts** in the **numbers of forestry specialists and forest management facilities** have decreased the ability to respond to immediate threats like pest infestations and forest fires.

The **overall effectiveness of conservation activities seems to be “hit or miss”**. Russia’s entire protected area system – including *zapovedniks* (equivalent to IUCN Category I) – covers about twelve percent of its territory and provides wide representation of the nation’s biomes and ecosystems. However, within protected areas, conservation remains at serious risk due to **inadequate government budgets and staffing**, and a **lack of coordination and information exchange** of basic ideas, lessons learned, and data management. There is a **lack of modern, world-standard planning and management** at most of the sites. The efforts of **non-governmental organizations (NGOs)**, especially in the Far East with large mammal populations, habitat management, anti-poaching work and awareness about illegal logging, **have been successful** across several years. However, Russia’s policy to curtail assistance from international entities and to actively discourage civil society/NGO efforts at conservation greatly limits opportunities for positive gains in conservation.

Despite the precarious state of conservation management today, Russia does have the potential and the resources to address most of the threats discussed but **whether it has the necessary political will is the largest question**. Weaknesses in the 2007 Forest Code are arguably the largest threat to biodiversity and sustainable forest management in the country but reforming it is a highly political issue. Technical specialists, government decision-makers, NGOs, and the Russian citizenry all recognize that it remains seriously flawed, despite 22 inadequate attempts in the past three years to fix it.

The **key threats** to Russia’s biodiversity and forests are:

Habitat loss, and conversion of forests and other natural habitats – These threats stem from forest fires, illegal logging, cutting practices, mining, oil and gas exploration and development and forest road building.

Macro-environmental change – Threats from global climate change are mounting and could become the most serious of these key threats. Impacts from climate change include black carbon effects, melting of the permafrost and changing behavior patterns and ranges of various flora and fauna.

Pollution of aquatic ecosystems – Russia possesses the largest wetland system in the world, and mining, industrial and municipal pollution threatens many rivers.

Overharvesting of selected species – These include salmon, sturgeon, taimen, saiga antelope, and Korean pine.

These threats have multiple **underlying root causes or drivers** that can be broadly categorized as **political/institutional** (inadequate institutional/legal frameworks, lack of political will), **economic** (greater incentives to overharvest than conserve species), **external pressures** (global climate change) and **social** (limited awareness, understanding and information on conservation). Therefore, actions to reduce direct threats to Russia's biodiversity and forests must focus on the causes and drivers.

For instance, actions and standards are needed to address the current policy and institutional weaknesses in the current legal framework that are inadequate, ambiguous or out of date. Functional, transparent, accountable, and more participatory actions and approaches need to be adopted and practiced at regional and municipal levels to improve environmental governance. There is an opportunity for greater engagement by/with private sector enterprise in its involvement in environmental activities in the regions as both supporters of biodiversity conservation and as service providers for business skills and planning expertise. Greater awareness of the plights of threatened species and their habitats from a livelihood standpoint could be achieved with improvements in civil society participation in information and environmental education activities and social marketing. More specific actions within this framework can be tailored to address the key threats within specific regions.

The extent to which current USAID activities meet the identified needs is not extensive, as most of USAID's activities address priority issues other than biodiversity. Noted exceptions are USAID funding of the US Forest Service partnership activities, grants to NGOs addressing strategies for tiger and leopard conservation, etc., and the Community Development Support Program and Amur River Initiative. USAID is a small actor in a vast country with significant environment and biodiversity issues. Investments, therefore, need to be highly selective and strategic to be most effective. In developing its new country strategy, we recommend that USAID/Russia continue to **focus on those regions in which it has experience** (in southern Siberia and the Russian Far East) and **invest in the following programmatic areas** in order to **have a greater positive impact on forests and biodiversity**:

- Raise awareness of the amended Lacey Act and its impact on Russia's international wood products markets (under the Mission's Office of Democratic Initiatives);
- Address corruption related to illegal logging and transparency of information sharing connected to timber harvesting plans (under Good Governance programs);
- Work with Russian counterparts to address climate changes that impact habitats and migration routes, affect land-use changes and put forests' role as a carbon sink at risk; and
- Strengthen protected areas management through activities including:
 - Hands-on, management-by-objective planning;
 - Development of viable management zones;
 - Improving local livelihoods through action planning linked to strategic tourism development, ecotourism infrastructure, and environmental education;
 - Improving database management and linkages within the protected area system;
 - Strengthening of governance (participation, education, enforcement); and
 - Improving equitable economic growth (tourism, ecosystem services).

7.0 OVERVIEW OF BIODIVERSITY IN RUSSIA

Biodiversity in Russia was documented extensively in the 2002 Biodiversity Analysis and again in the Biodiversity Update in 2005. Nevertheless, it is important – and in fact mandated in the FAA 119 (see box and Attachment 2) – to once again draw attention to the flora and fauna present in various eco-regions in the country. Following this overview, we will discuss the threats to this biodiversity, the activities being undertaken to protect it, and the actions necessary to conserve biological diversity in subsequent chapters.³⁸

US Foreign Assistance Act (FAA) Section 119

Section 119 of the FAA states that ... *an important objective of the US development assistance should be the preservation of animal and plant species through the regulation of the hunting and trade in endangered species, through limitations on the pollution of natural ecosystems and through the protection of wildlife habitats.* It also states that in order to preserve biological diversity ... assistance can be provided ... *to assist countries in protecting and maintaining wildlife habitats and in developing sound wildlife management and plant conservation programs.*

Section 119 stipulates that ... *each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of the actions necessary in that country to conserve biological diversity, and the extent to which actions proposed for support by the Agency meet the needs thus identified.*

As a country that possesses an eighth of the earth's terrestrial area, it is not surprising that Russia also boasts substantial biodiversity. From the Caucasus region – which is a hotspot for biodiversity conservation – to the mountains in Southern Siberia to the Russian Far East (RFE), the country encompasses nine time zones and almost as many biomes. Ecosystems in these areas include diverse and often endemic species that are rare or extinct in other parts of the world, such as the Amur tiger, brown and polar bears, the Baikal seal and snow leopards, to name a few (see Attachment 4 for a list of threatened and endangered species).

Russia harbors more than 11,400 species of vascular plants; 269 species of mammals; 528 breeding bird species (730 species of birds altogether); 32 species of amphibians; 94 species of reptiles; 290 freshwater fish species; and tens

of thousands of invertebrates, fungi, and protozoa.³⁹ This represents about five percent of mammal species and bird species in the world (IUCN 2010).

7.1 BIOMES

Eight terrestrial biomes – or major ecological communities – are represented across Russia, and within each biome are many ecosystems, such as grasslands, forests, lakes, rivers, and marshlands. Within each ecosystem, in turn, are many distinct natural communities. Each of the biomes is mentioned below, and all of them are afforded some protection in *zapovedniks*⁴⁰.

1. Polar deserts occur on the islands and archipelagoes of the Arctic Ocean and have very little ecological diversity due to the extreme climate (vascular plants amount to only 20-30 species per square km). Most vegetation consists of primitive spore-producing plants such as lichens, algae, liverworts and mosses, and mammals in this biome include polar bears (*Ursus maritimus*), seals, and walrus (*Odobenus rosmarus*).

2. Arctic tundra also has a circumpolar distribution, occurring on Arctic Ocean islands in European Russia and in a narrow belt along the Kara, Laptev, North East, and Chukchee Seas, Novosibirskie Islands and Sevemaya Zemlia. The carpet formed by lichens and mosses

³⁸ The primary sources of information in this chapter are SCEP (1998) and Chemonics (2002 and 2005). Where possible, this information was updated and relevant citations are provided in the text.

³⁹ Provided in Chemonics (2005); an updated number of species since then was unobtainable.

⁴⁰ For a list of the *zapovedniks* that afford protection to each biome, see SCEP (1998).

maintain the characteristic permafrost of this biome (thawing of the permafrost is detailed in Annex E, Case 2), and there are 70-100 flora species per square kilometer. Rare animal species present in this biome include walrus, snow goose (*Chen hyperboreus*), and Bewick's swan (*Cygnus bewickii*). Main threats to this biome are oil and gas prospecting, extraction, and transportation.

3. Subarctic Tundra is distinguished by peculiar wetland formations resulting from cyclical thawing and freezing and species diversity may be double that of the more northern biomes described above: there are 250-300 species of vascular plants per square kilometer, 150-200 species of mosses in some localities, and up to 100 and 25 species of birds and mammals, respectively, at a specific geographic point. Rare species include falcons (*Falco rusticolus*, *F. peregrinus*), Bewick's swans, and red-breasted goose (*Branta ruficolis*).

4. Boreal Coniferous Forests (dark coniferous *taiga*) are widespread in the flatlands and mountains of European Russia and Siberia. Relatively few tree species – such as spruce, fir, cedar, pine, and larch – dominate these forests, which harbor large numbers of species of vascular flora (400-700), birds (up to 150) and mammal (up to 25) species per square km. Few species are endemic to these forests, but many charismatic mega fauna can be found here, such as brown bear (*Ursus arctos*), moose (*Alces alces*), lynx (*Lynx lynx*), otter (*Lutra lutra*), beaver (*Castor fiber*), and sable (*Martes zibellina*).

5. Larch Forests (light coniferous *taiga* and thin forest) are found in central and eastern Siberia, Transbaikalia, and the RFE. These larch-dominated forests are often interspersed with pine forest and tundra, and permafrost underlies much of this biome. Biodiversity is lower than in Boreal Coniferous Forests: sites often boast 400-450 species of vascular plants per square km, and up to 80 bird species and 40 species of mammals.

6. Broad-leaved and Mixed Coniferous and Broad-Leaved Forests are present in the Russian Plain and the southern RFE. Tree species, such as oak (*Quercus spp.*), maple (*Acer spp.*), linden (*Tilia sp.*), and ash (*Fraxinus spp.*), dominate this biome, and in the northern parts conifers such as spruce (*Picea spp.*), pine (*Pinus spp.*), and fir (*Abies spp.*) can be found. Very high in biodiversity, sites in this biome may host as many as 800 species of vascular plants, 150 bird species, and 80 species of mammals. Rare and endangered species found in these forests include tiger (*Panthera tigris*), leopard (*Panthera pardus spp.*), lady-slipper orchids (*Cypripedium spp.*), ginseng (*Panax schin-seng*), and Korean pine (see Chapter 9). Anthropogenic impacts have caused these forests to diminish to the point of near-extinction⁴¹, and now they can be found in several *zapovedniks* and other conservation areas.

7. Forest Steppe and Steppe are found in European Russia and southern Siberia. Grasslands are most prevalent and species diversity for vascular plants in the more moist (mesic) steppes (1,100 species) is more than double that of arid steppes (500 species). Likewise, high numbers of animal (50) and bird (90) species are present, including many rare and endangered vertebrate species – such as the Marbled Polecat (*Vormela peregusna*) and birds of prey – and flora species, including grasses (*Stipa spp.*), peony (*Paeonia tenuifolia*), and oilseed (*Crambe spp.*). Various types of steppes in the Northern Caucasus and European Russia have been converted to agriculture, and many small, remaining sites are protected in *zapovedniks*. Over 40 percent of this biome has been completely transformed by economic activities.

8. Semi-arid and Arid biomes are found south of arid steppes and near the Kazakhstan border and the mountain valleys of southern Siberia. Grasses dominate these biomes, and there is a

⁴¹ According to Biodiversity Conservation in Russia: the First National Report of the Russian Federation (1998).

component of ephemeral flowering plants, as well as a few trees and shrubs. Hosting relatively less biodiversity, these sites typically host 150-200 species of vascular plants per square km (or fewer in the driest sites), 25-30 species of mammals, 40-50 species of birds, and 25-30 species of reptiles. Found here (and in the steppe biome) are the *Saiga tatarica*, an antelope critically endangered due to illegal hunting and habitat loss. Cattle grazing takes place extensively in this biome in North Eurasia, and large areas are also irrigated for crops. Anthropogenic exploitation of these biomes has led to biodiversity depletion of fauna – for instance, Pallas' cat (*Otocolobus manul*) and Tawny Eagle (*Aquila rapax*) – and wild ecosystems have been replaced by broken sands, saline lands, and depleted pastures on large tracts of land.

Within each of these biomes lie aquatic ecosystems, many of which are particularly important for biodiversity. Russia has 120,000 rivers extending a total length of 2.3 million km, almost 2 million lakes, and a 60,000 kilometer-long marine coastline. Huge wetlands on the coast are home to various species of waterfowl, and millions of sea birds live in colonies on the coast and islands, particularly in the Barents and Okhotsk seas. The marine littoral zone on these sea coasts is also highest in biodiversity, as 5-meter tides create a variable tidal zone, and the warm water coming in from the south into the Sea of Japan also makes this area particularly rich in biodiversity. Sea mammals such as seals, walrus (*Pinnepedia*) and 32 whale species and subspecies can be found in Russian waters. Most sea mammals are endangered, and many are protected by international treaties.

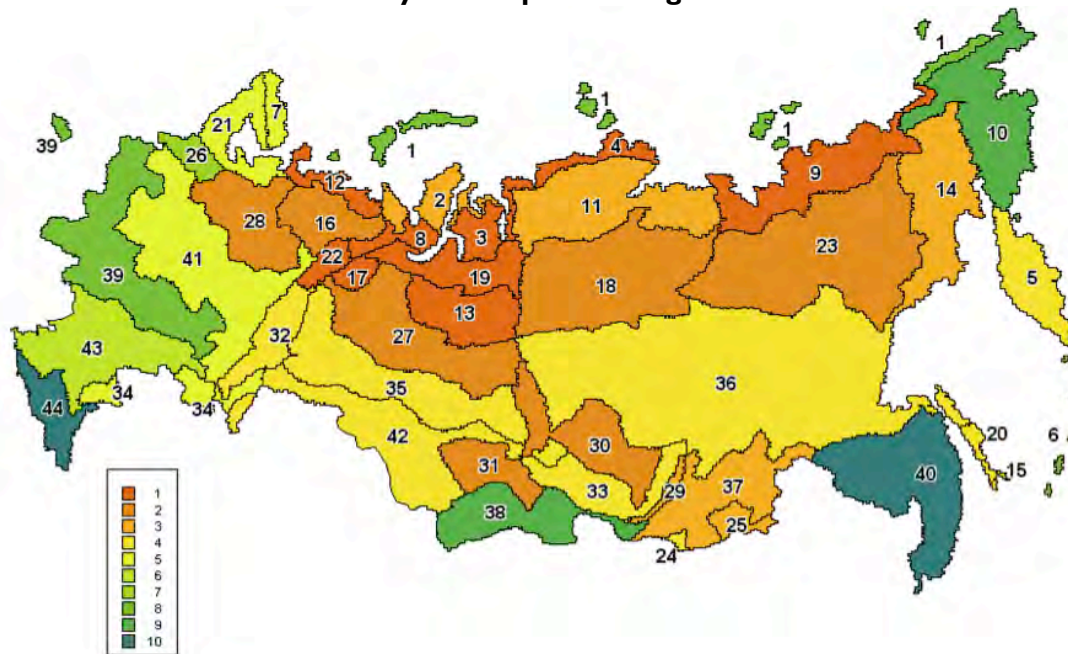
7.2 REGIONS OF PARTICULAR IMPORTANCE

Russia is further delineated across the eight biomes by 44 eco-regions, which describe large areas of land or water containing a characteristic set of natural communities with similar species, ecological dynamics, and environmental conditions (Olsen and Dinerstein, 2002). The maps of eco-regions (see next page) indicate the relative concentration of biodiversity across the country, as well as the degree of conflict between biodiversity and development. As illustrated, high biodiversity and speciation are particularly found in the northern Caucasus, the steppe and steppe forests of southern Europe and southern Siberia, the mixed-forests of the southern Russia Far East, and the Chukotsk and Kamchatka peninsulas. Olsen and Dinerstein (2002) identified 19 eco-regions in Russia as critical to protecting the most outstanding and representative habitats for biodiversity in the world (Attachment 5 lists these eco-regions).

The mountainous broad-leaved forests and upland steppe of the Caucasus (Eco-region 44) is the most biologically diverse area in Russia, and the Caucasus region – extending from Russia into Georgia, Armenia, Azerbaijan, Turkey, and Iran – is also the only global biodiversity hotspot in Russia. In Russia, four zapovedniks and two national parks protect biodiversity in this region: (Center for Russian Nature Conservation). This eco-region is home to species like the endangered Western tur (*Capra caucasica* and *Capra cylindricornis*), the population of which has declined more than 50 percent over the last three generations (Weinberg, 2008). These goat species inhabit alpine and subalpine zones, and various threats to the species include livestock grazing, impacts of severe winters, and poaching – the last of which is probably most significant in the recent population declines.

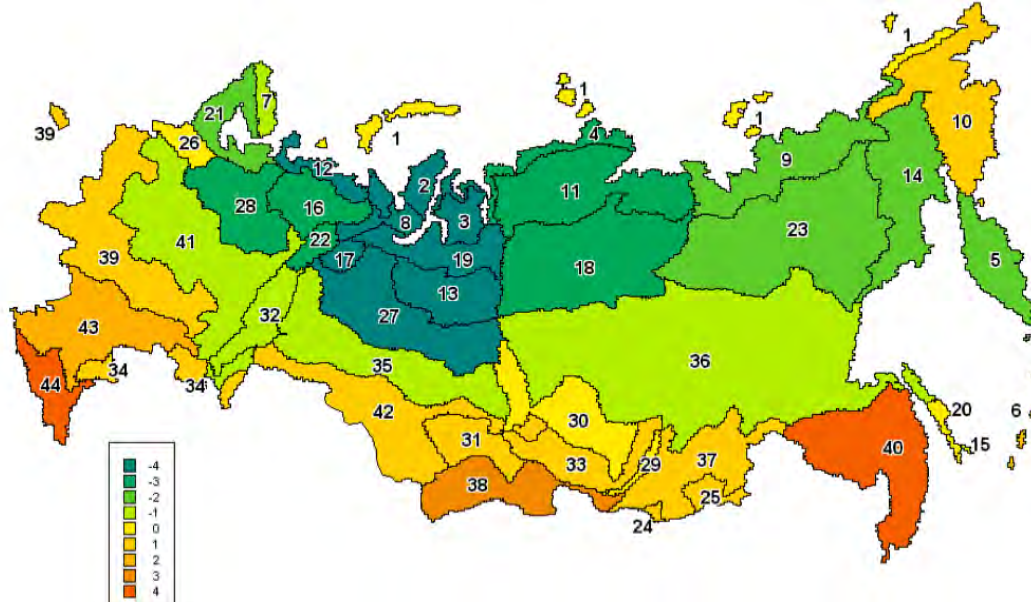
The middle and southern *taiga* of the southern Far East (Eco-region 40) harbors substantial biodiversity, including the endangered Amur tiger (see Annex E, Case 7) and the critically endangered Amur leopard (*Panthera pardus* ssp. *orientalis*). In a 2007 census, only 14-20 adults and 5-6 cubs of this very rare subspecies of leopard were counted in southwestern Primorye (Jackson & Nowell, 2008), although a 2009 census counted 7 leopard cubs in Primorye and shows at least 40 individuals of this species (Gorbachev, 2010, December 10). Genetic variation in the Amur Leopard is the lowest among leopard subspecies (Uphyrkina et al. 2002).

Figure 7.2.1 Relative Biodiversity Values per Eco-region



Light to dark green indicates regions with high biodiversity, endemism, and endangered species. The numbered eco-regions correspond to the list of eco-regions in Attachment 5. (WWF, 2001)

Figure 7.2.2 Degree of conflict between biodiversity conservation and development



Orange to yellow indicates a high degree of conflict, and light to dark green indicates a low degree of conflict. WWF (2001).

Forests, mountain tundra and meadows of the Kamchatka Peninsula (Eco-region 5) and the tundra of northeast Asia (of the Chukotsk peninsula, Eco-region 10) host various species of flora and fauna. For instance, the world’s largest concentration of brown bears congregate near a

lake in Kamchatka, and as much as one-fifth of the world's wild salmon spawn in the rivers of the peninsula (Strebeigh, 2010). The critically endangered spoonbill sandpiper (*Eurynorhynchus pygmeus*) breeds, stages, and winters on the Chukotsk and northern portion of the Kamchatka peninsula, and this species has an aging and rapidly declining population (IUCN 2010).

7.3 CONSERVATION MANAGEMENT

In the 1920s and 1930s, Russian naturalists traversed the country to establish *zapovedniks* (nature reserves). Kavkazsky Zapovednik in the Russian Caucasus was established in 1924 and became one of the main sites for reintroducing leopards into European Russia (Strebeigh, 2010). Created in 1935, Krotontsky Zapovednik on the Kamchatka Peninsula boasts volcanoes and geysers, tundra and glaciers, grasslands, rivers, and lakes that are home to 60 protected species of mammals including the endangered Steller Sea Lion (*Eumetopias jubatus*), caribou (*Rangifer tarandus*), arctic fox (*Alopex lagopus*), and large colonies of seabirds and marine mammals (Center for Russian Nature Conservation). These are but two of the 102 *zapovedniks* and 41 national parks that cover about 43 million hectares, which is just under two percent of Russian land (Strebeigh, 2010). The two most recently created *zapovedniks* were Kologrivskiy Forest in 2006⁴² and Utrish *zapovednik* in September of 2010⁴³.

The Global Environment Facility (GEF) has funded several projects (included in Attachment 1) that have worked to safeguard Russia's biodiversity, including the spoonbill sandpiper, Siberian crane (*Grus leucogeranus*), Steller's sea eagle (*Haliaeetus pelagicus*), brown bear (*Ursus arctos beringianus*), caribou (*Rangifer tarandus*), and snow sheep (*Ovis nivicola*) (Fitzpatrick, 2010). Recently, however, a group of 200 Russian researchers analyzed the gaps in Russia's protected areas and found that for Russia's rare and threatened species, protection was adequate for only 51 percent of mammals, 41 percent of birds, and 36 percent of reptiles (Strebeigh, 2010).

7.4 ECOSYSTEM SERVICES

The various ecosystems in Russia provide ecosystem services, which may be classified as environmental goods, regulating services, supporting services, and cultural services. For instance, the vast expanses of forest in the country – encompassing one-fifth of the world's total forests – provide *regulating services* by potentially capturing (younger forests) and storing (mature forests) more carbon than forest lands in any other country. The permafrost of the tundra stores substantial amounts of carbon (see Annex E, Case 2 for a more detailed description of the potential ramifications of the melting/thawing of the permafrost on habitats). Forests play a role in mitigating floods as well as droughts.

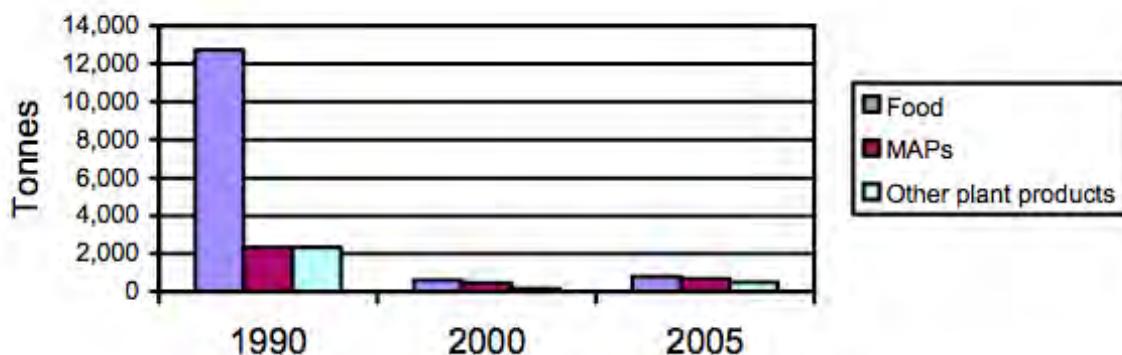
Russia's forestlands also supply large quantities of *environmental goods* like timber (see Chapter 2 in Part I), as well as various non-timber forest products (NTFPs) such as berries, nuts, mushrooms, honey, medicinal herbs, furs, and game, including over 1,700 forest foods (McCaleb, 2001), and NTFPs such as resin are harvested as inputs into industrial production (for example, *Pinus sylvestris*, found in Eastern Siberia and other areas, is tapped to make turpentine-based paints). In 2000, an estimated 9,000 tons of game meat and 20 million hides, skins and trophies were taken from Russian forests (FAO, 2005). Russia's total national fish catch in 2009 was 3,675,000 tons, of which about 60 percent is harvested from the RFE (Zaytsev, 2010).

⁴² Protected Planet. Russian Federation IUCN category 1a [zapovedniks]. <http://www.protectedplanet.net/>

⁴³ <http://www.government.ru/gov/results/12080/>

Under the command economy of the Soviet Union, forests were divided into three types based on timber potential and national economic significance, including forests protected from timber extraction because of various other values, such as soil and water conservation, and also to be managed for NTFP production⁴⁴. These included pine nut forests of Western Siberia (*Pinus sibirica*) and the RFE (*Pinus koraiensis*), smaller areas of nut-bearing deciduous species (walnut, chestnut, almond etc.) in the Urals, and forests with berries. The commercial value of berries in Arkhangelsk (northwestern Russia) is estimated to be 2.5 to 3 times the value of timber. After the breakup of the Soviet Union, suppliers of NTFPs lost their main state-operated buyers and – together with new taxes and imported alternatives – this led to a dramatic decline in official NTFP harvests (see figure 7.3). (Wong, 2009) The extent of undocumented harvests is not fully known, however, and forests should be appraised as more than the standing value of the timber to include NTFPs.

Figure 7.4 Removal of Non-Timber Forest Products in Russia, 1990-2005



MAPS – Medicinal and Aromatic Products. (FAO, 2005)

Currently, private firms in Russia have achieved some success in producing and marketing NTFPs⁴⁵ – including recreational and ecotourism *cultural services* of the landscape – but compared to the size of the resource and historic exploitation levels, harvests are small (Wong, 2009). Expansion of the NTFP sector has been cited as one important way to generate income for impoverished rural people, in addition to having the highest sustainable development potential (UNEP, 2006).

Nine percent of the globe's constantly renewing water sources is found in Russia's rivers, and 26 percent of the world's surface water is stored in the country's lakes – including Lake Baikal, the most voluminous lake in the world with water so pure it is potable (Brunello, 2004).

Much of the steppe biome has been used for agricultural production, another example of an *environmental good*. Almost 9.5 percent of the Russian population works in agriculture, and permanent crops occupy 1.5 percent of arable land (FAO Country Brief). Russia is ranked fourth in the world in terms of wheat production (after China, India, and the US), third in potato production, first in sunflower seeds, and second in sugar beets (FAO STAT). Nonetheless, the value of agricultural imports exceeds exports by over five times.

⁴⁴ The Forest Code revisions in 2007 mainly affect forests designated for timber production.

⁴⁵ For example, a company in Tomsk makes high quality birch bark products and an ecotourism venture in southern Siberia both have been operating successfully since the early 1990s (Wong, 2009).

8.0 RUSSIA'S FOREST AND BIODIVERSITY-RELATED LEGISLATION, POLICIES, STRATEGIES, PROGRAMS AND CONCEPTS

Russia hosts a significant share of the planet's forest resources (ca 80.5 Bm³ or 21 percent of the world timber stock) with more than 45 percent of its territory under forest cover. It is a key player in the global timber trade market and is also known as one of the main sources of illegal timber. Various ecosystems and biomes – such as steppes and broad-leaved/mixed coniferous broadleaved forests mentioned in Chapter 7 – have been seriously degraded, and habitat loss and fragmentation (due to various anthropogenic causes, including fires), atmospheric and aquatic pollution and climate change are causing serious threats to flora and fauna. Legislative changes and policies governing human use of and impacts on these resources also have significant impact on the sustainability of forests and biological diversity. This chapter reviews important changes in laws and policies over the past five years that impact these resources.

8.1 OVERVIEW OF RUSSIAN FOREST LEGISLATION AND POLICIES

Russia has made major structural changes to its forest sector through the Forest Code of 2007, notably in decentralizing considerable responsibility for forest management to the regions and in allowing a role for the private sector in forest management, through concession agreements. While these changes were desirable in principle, they have had serious negative side effects because they were not properly vetted, they were not accompanied by any guidance (or interim budget planning) for their implementation, and responsibilities were devolved to the regions with little regard for their full consequences. As a result, issues that had been simmering for some time (forest fire management, pest control, illegal logging, poor staffing, and corruption), have manifested themselves even further.

The major forest legislation issue today is the absence, or low quality, of regional legislation, which is needed to regulate forest resource use by businesses and citizens, prevent illegal logging, and manage forest fires. The ongoing decentralization of the forest sector was not accompanied by compensation measures from the federal government to the regions in the form of subsidies, methodological and legislative support or management assistance during the transition period. This has resulted in dramatic cuts in the numbers of forestry specialists and forest management facilities and an inability (in most regions) to respond to immediate threats like pest infestations and forest fires. The dramatic fires in summer 2010 in European Russia underscored the overall management and decision-making crisis in the forestry sector.⁴⁶

The chaotic situation described above – together with the lack of standardized approaches in the regions and the delay in the adoption and disclosure of the additional rules required by the new Forest Code – has meant that illegal forest product trade continues. The policy of “there is no policy,” coupled with demoralized forest management staff in the regions and their lack of resources, has resulted in a significant increase in illegal logging and illicit collection of non-timber forest products (mushrooms, berries, medicinal plants, fuel wood, etc.). The assessment team heard that, by some estimates, more than 50 percent of fuel wood in the rural areas of the country in 2010 is harvested illegally. This situation also had an extremely destructive effect on small businesses. The vast distances involved and recent economic difficulties have also complicated the processes of monitoring and controlling illegal logging and timber trade.

⁴⁶ <http://www.wwf.ru/news/article/7078>.

The lack of a standardized approach to the transfer of responsibilities means that information about it is sketchy and adherence to the new rules is spotty. According to research performed by International Union for the Conservation of Nature (ENPI-FLEG, 2009), in Russia only one quarter of 83 regional forestry agencies' websites contained necessary information on the rules of forest resource use. The situation is very uneven. The Irkutskaya *oblast* website, for example, has successfully finished elaborating the principal laws regulating the forestry sector, while the Forestry Agency of Moskovskaya *oblast* has not even bothered to open a website, a direct challenge to the requirements of Federal Law #8-FZ.

The second major problem is related to undefined responsibilities for managing the forest land not under lease (concession) as well as the overall reduction in resources to do so. The number of forest rangers in 2008-2009 was reduced by almost 100,000. This makes it practically impossible to monitor the 87 percent of Russian forest land that is not leased by a concession management entity. The catastrophic forest fire situation in Russia in 2010 revealed serious weaknesses in the forest management system and an urgent need to optimize forest governance in the country. The series of amendments (22 rounds) between 2007 and 2010 did little to improve the situation. These included serious contradictions between the Forest, Tax and Land Codes, the introduction of contradictory changes mentioned above, and the presence of links to not-yet-existing supportive legislation.

The dichotomy between the federal and regional legislation also reduced the abilities of forest rangers to adequately react to violations in the forest sector. As a result of the 10 percent to 100 percent regional reductions of the ranger staff, their current practice of operation can be described simply as "observe and report". They now have no ability to fine violators or actively protect forests from illegal logging. All these functions are transferred to the regional and municipal courts, police and other law enforcement institutions. Each region is also in the process of adopting its own set of forest regulations and policy. This is not necessarily a bad thing but it requires additional information and time. And, all the while, forest activities continue to be inadequately monitored.

Devolving all responsibility for forest management and fire prevention onto leaseholders, whether they are large or small, has resulted in significant hardships for many and a movement to less-than-transparent situations for others. Small forest leasing companies in particular have felt the brunt of this transfer of responsibility and numerous bankruptcies have ensued. In the Pskovskaya *oblast*, for example, up to 50 percent of the businesses related to timber became bankrupt by 2010 (Reshetov, 2010). And, for the same period, estimates of illegal logging in Primorskiy *krai* and Zabaikalskiy *krai* exceeded 30 percent of the total timber officially cut.

Certain portions of the new Forest Code contradict the existing system of international voluntary forest certification, so that Russian companies are forced to violate national laws in order to gain access to international forest product markets. Buyers of forest products in these markets are, with increasing frequency, adhering to certification standards that require that the product originates from a sustainably managed forest and that the chain of custody of the product is also legitimate. At present these standards are at odds with the Forest Code.

According to expert comments (www.wwf.ru), the current Forest Code is a step backward from the principles defined in the 2005 St. Petersburg Declaration on FLEG (Forest Law Enforcement and Governance). The FLEG Program was created to combat the threats posed to forests by illegal logging, trade, poaching and corruption. The initiative has processes that address the complex and politically-sensitive issues of illegal logging at national and regional levels, and it is implemented in cooperation with major stakeholders from governments, civil society and the private sector. It is also substantiated by the recently adopted European Union (EU) legislation establishing the framework of proof for the legal status of timber provided to the European

market. A new round of discussions between Russia and the EU on this issue is scheduled for Spring 2011 (e.g. Russian Chamber of Commerce roundtable with EU officials on the new EU Regulation 995/2010 which will take full effect in 2012). However, there is a serious concern that this mostly political decision-making is not fully substantiated by technical documents and procedures to define a mechanism for proof of legal status of timber coming to the EU market. The Lacey Act in the US (see box) and the new EU forest legislation just mentioned are together forcing Russia into a situation where it must continue to improve and optimize its own legislation and harmonize it with international market conditions.

Since the Assessment Team's visit certain positive steps to improve the situation with the forestry legislation have been taken. Another set of amendments for the Forest Code approved on December 29, 2010 is showing promise. These removed many of the most obvious and critical discrepancies in this law regarding logging control, timber origin tracking, defining funding sources for various mandates and responsibilities among forestry authorities. It also contributed significantly towards establishing effective mechanisms of fire prevention and forest management. For the first time in the history of modern Russia, these amendments were widely discussed and the opinions of environmental NGOs (WWF, which has also coordinated the process, Greenpeace, Social-Ecological Union, IUCN, etc.) have been taken into account. Also recent developments and the level of dialogue between federal and regional authorities with businesses and civil society on the forestry issues bring some optimism for positive change.

The Amended Lacey Act

To address illegal logging and other illegal plant trade, the amended Lacey Act (in force since 22 May 2008) does three main things:

Prohibits all trade by the US in plants and plant products – including furniture, paper, and lumber – that are illegally sourced from any US state or foreign country;

Requires importers to declare the country of origin of harvest and species name of all plants contained in their products (a provision that is currently being phased in); and

Establishes penalties for violations of the law, including forfeiture of goods and vessels, with fines and jail time.

Source: EIA/WRI. 2010.

8.2 IMPACTS OF RECENT LEGISLATION AND POLICIES ON BIODIVERSITY

Recent changes in the Forestry Code may make it more difficult to establish new protected areas (PAs) since forests are now supervised by the regions. Kologrivsky Les *Zapovednik*, created in 2006, and Utrish *Zapovednik* in 2010, are the only *zapovedniks* established since 2000. If this trend continues and other development activities expand, landscape and habitat fragmentation – a serious problem for animals dependent on migration corridors for their survival – will increase. To address these issues, the Russian government has financed several new projects focused on large mammal conservation of species like the Amur tiger, polar bear, snow leopard, etc. The development of research projects under the Russian Geographical Society focused on various aspects of Arctic ecosystems is an encouraging demonstration of political will for biodiversity conservation.

Also, three Federal Targeted Programs in environment are now being prepared:

- Environmental Safety of Russia (2012 – 2020);
- Lake Baikal conservation and social-economic development of Baikal Nature Territory (2011 – 2020) (see Annex E, Case 6); and
- A national program on improving environmental health and ecosystems rehabilitation in the Baltic Sea (2012 – 2020).

The downside of the targeted approach is that it has resulted in a general shift from long-term strategic environmental policy-making towards a strategy that is very narrowly targeted with relatively short-term projects.

Nevertheless, certain positive shifts in the sphere of environmental policy may also be observed. The Ministry of Natural Resources and Environment (MNRE) (see Chapter 4) has developed a plan for reforming Russian environmental legislation that includes the following priority areas:

- Environmental impact assessment;
- Introduction of environmental norms; and
- Environmental monitoring.

To implement this plan, three governmental decisions were adopted between 2008 and 2010 to regulate and enforce state functions on environmental monitoring of industries, housing and other economic activities. In addition, improvements in the legal system regulating waste management and atmospheric pollution by associated gas (from oil wells) were also adopted. Other steps to introduce new environmental policies in Russia include: (1) the introduction of a new and more adequately justified system of payments for environmental damage; and (2) a transition from the maximum allowable emissions levels towards environmental norms (respective governmental decisions were drafted in 2010).

If the above actions are successful in reducing pollution and introducing a sense of environmental accountability, the impact on conservation could be very positive. However, as noted in Chapter 4, progress over the last two years has been disappointing.

9.0 THREATS TO BIODIVERSITY IN RUSSIA

9.1 KEY THREATS

The key threats to Russia's biodiversity and forests are:

- Habitat loss, conversion and fragmentation of forests and other natural habitats;
- Macro-environmental change (e.g., global climate change)
- Pollution of aquatic ecosystems; and
- Overharvesting of selected species.

Ranking varies slightly according to the stakeholders interviewed for this assessment and secondary sources. It is based mainly on the perceived severity, the area affected, the number of species involved, the degree of urgency and other factors. The size of Russia is also a significant factor when it comes to both listing and ranking these threats. National experts believe that about 65 percent of the total Russian territory of 17,000,000 km² can be characterized as pristine and almost unaffected by economic activities and with ecosystems that are fully preserved (Danilov-Danilyan *in* World Bank, 2009). However, by examining the country in smaller, regional units such as the eco-regions described in Chapter 7, or even in terms of the administrative regions, the threats to biodiversity become evident. Areas of high biodiversity, endemism, populations of endangered species, critical habitats and landscapes worth protecting according to global standards, are limited; according to one source (Olsen and Dinerstein, 2002), the number is fewer than 20. It is at this regional scale that the key threats listed above, alone and/or in combination, apply.

Biodiversity – “the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.” In simple terms, it can be described as the “diversity of life on Earth.” Biodiversity is under heavy threat, and reducing and preventing further biodiversity loss are considered among the most critical challenges to humankind. Of all the problems the world faces in managing “global goods,” only the loss of biodiversity is irreversible. (*Fitzpatrick. 2010*)

The above threats are not new and are very consistent with the findings of the last assessment for Russia (Chemonics, 2005) and they have been noted by others (RAS, 2001; WWF-Russia, 2005), but perhaps not in the same order. As discussed in more detail below, the threat of global climate change is increasing in urgency, and – so much so perhaps – that it might even be ranked first. Across the vastness of the country, habitat loss and conversion of forests and other habitats may soon be ranked as less severe than the forces of climate change that are becoming better known, understood and measured. The volume of scientific evidence is beginning to show that temperature changes, even slight ones, are already impacting the Russian Arctic landscape and the species that inhabit it.

Chapter 2 of this report presents a synopsis of pollution sources and impacts. Pollution of aquatic (fresh water and marine) ecosystems is quite pervasive in some areas, especially near population centers and industrial plants. Air and soil pollution – caused by past Soviet mining, industrial and other activities – are also significant threats to biodiversity in some regions but do not have the immediacy of aquatic pollution threats. The actual impacts of water pollution on particular species, species diversity and ecosystem functions in Russia are not well known, although the Assessment Team did note that studies are ongoing and that some institutes are well equipped to monitor and study these threats.

Overharvesting of selected species is certainly not uniform across the country, but impacts are more severe in some regions (European steppe, Russian Far East). Some anadromous fish species of the Pacific Coast ecosystems and sturgeon populations of the Caspian Sea have been particularly affected by overfishing. Similarly, some forest species (e.g., Korean Pine) are particularly threatened from overcutting and seed collection. Non-timber forest product species in some regions are also under extreme pressure due to unregulated collection.

HABITAT LOSS, THE CONVERSION AND FRAGMENTATION OF FORESTS AND OTHER NATURAL HABITATS

Human activities and natural causes that alter or fragment vegetative cover or change land use are a major threat to Russia's biodiversity. Forest fires are the most extensive damaging element of this alteration of the natural environment. This conclusion remains unchanged from previous assessments but the issue has become more visible in 2010 due to the proximity of fires and smoke to Moscow, St. Petersburg and other population centers in western Russia. The total area burned was actually close to the nationwide average, but in 2010 the fires were located where more people could witness their impacts. Forest fires can be natural events caused by lightning or volcanic eruptions, and in these cases ecosystems can recover from them. In Russia the most extensive fires are human-caused (Askenov, 2002; World Bank 2006; Min. for Emergency Situations, 2010), and often by intentional vandalism (90 percent of the 2010 fires began on weekends), or from the (tolerated) agricultural practice of burning crop residues. In 2010 the lack of fire monitoring, control and management pointed out the weaknesses of the Russian Federal Forest Agency and the inadequacies of the Forest Code. (These were highlighted in the previous chapter and are discussed further in Section 9.2.)

Illegal logging and overharvesting, discussed at length in the 2005 assessment, continues and – in many regions (Irkutsk Oblast in southeastern Siberia, Khabarovskiy and Primorskiy regions in the Russia Far East) – is exacerbated and remains a serious concern, especially as it relates to habitat loss. Other major timber producing regions (the Caucasus and northwestern Russia) also experience effects from these activities, but the situation is the most grave in the RFE.

Forest habitats are often threatened by cutting practices, especially ones that favor one species over another, or ones that eliminate entire age classes that make certain niches barren zones for the production and sustenance for particular flora and fauna. Poor logging practices can also leave inordinate amounts of waste on the forest floor, raising the risk for catastrophic fire damage, or improper engineering of skid trails that exacerbate erosion and sedimentation, destroying seedbeds for new seedlings and lowering the oxygen available for aquatic species. But perhaps the most important threat from these activities is the access (and fragmentation of habitat) created by forest road building. These roads open up thousands of square kilometers of previously inaccessible habitat to legal hunters, poachers, collectors and gatherers of food and medicinal plants and other non-timber forest products, all-terrain-vehicle (ATV) recreationists and others. And, given the severity of recent economic times, this access is a boon to those local people who derive much of their livelihoods from the forest. But it is the exact opposite for the animals that inhabit these forests, rivers and streams, and the flora which depend on these niches to propagate.

Animals, especially mammals, need to be able to move unimpeded through vegetative/forested corridors. As Russia develops, its infrastructure, pipelines, transmission lines, roads and highways all create serious barriers to the normal movement and behavior of many species. These are worse than fire-created or other naturally occurring openings (and re-growth in the temperate zone is usually robust) in that these anthropogenic impediments are permanent barriers. The Russian Federation (RF) has shown some sensitivity in the past decade – for example, it re-routed a gas pipeline around Lake Baikal – but there still are no policy standards

that help evaluate and vet habitat and animal corridor and habitat fragmentation issues related to this infrastructure. Habitat fragmentation remains a serious threat.

Sakhalin Island in the RFE provides habitat for 90 species of fish, several listed as endangered and 20 others that are recommended for listing. Ten salmonid species inhabit the waters in and around Sakhalin and commercial fishing plays an important role in the island's economy and its employment opportunities, including those for ecotourism development. The direct pressures of poaching, overharvesting and habitat destruction in critical watersheds from mining, oil and gas interests and logging represent an increasing threat to these resources.

Invasive species form a specific example of habitat degradation and are most damaging in the agricultural and more densely populated areas of the country and in the aquatic environment, such as the Black Sea. Their impacts are initially economic, as they overrun sites inhabited by native species. In terms of agricultural biodiversity, they also will weaken the gene pool and a biome's natural propensity to adapt to changing conditions. This is becoming an even more important factor as climate change and globalization influences grow. However, in relative comparison to the other main threats to biodiversity and forests as a whole, they rank lower, mainly because the changes they bring occur over longer periods of time making them less "abrupt" than other threats. (This, in turn, may make responses to these threats more complacent, resulting in mitigation that may be too little, too late). A case study on invasive species is included in Annex E (Case 5).

Habitat loss and destruction of the Sakhalin taimen (*Parahucho perryi*), the largest salmonid in the world (up to 2 meters in length and often over 50 kilograms in mass) has put it on IUCN's critically endangered list.

This "river wolf," as it is known in the RFE, faces an uncertain future in its native habitats of Sakhalin and Kuril Islands and the far eastern mainland. The large lagoons of low gradient river floodplains (including the lower Amur River) are known to play a major role as overwintering habitats. Its exceptionally long generation time (14 years and up to 40 years) makes it a sensitive ecosystem indicator, but it is very range restrictive due to its preference for the lagoons, intermediate levels of precipitation, a requirement for cold temperatures and minimally developed agricultural land use.

Overfishing, increasing agricultural pollution (RFE mainland), river sedimentation due to mining, logging and oil/gas exploration (Sakhalin Island) have eliminated over 90 percent of the taimen's historic abundance and handicapped efforts to ensure the survival of the species. (WSC, 2010)

GLOBAL CLIMATE CHANGE

Threats from global climate change to biodiversity and forests are mounting and are being seen on a larger scale in Russia. Perhaps, in this instance, it will be the country's vastness that will allow this to be seen more clearly (see also Chapter 1). The country's 60,000 kilometers of coastline, the fact that the majority of the Arctic region lies within its borders and that 80 percent of the world's Arctic species are represented in Russia, and its border with 13 marginal seas of three oceans all contribute to its sensitivity as a country to warming temperatures and increased precipitation brought about by global climate change. These temperature changes, though slight and gradual, have the potential in a country like Russia to bring about changes over very large uniform ecosystems – i.e., the huge size of the *taiga*, for example, means that even a small change affects a vast area – and the ensuing impacts to species and commerce will likely be significant and disruptive.

Black carbon concerns (Kinder, 2010) are a real and immediate danger as they contribute to the melting of Arctic snow and ice, immediately threatening all manner of life forms inhabiting this region. (See also the case study on black carbon in Annex E, Case 1)

Changing behavior patterns observed in marine and bird species around Kamchatka are being more closely examined and discussed with other Arctic countries as direct correlations with rising sea temperatures are observed (Miquelle, 2010). A new framework convention on Arctic

marine and terrestrial life is taking on greater urgency, as ice and permafrost melt (WWF-Russia, 2008; Max 2010), threatening habitat corridors and marine migration routes (see Annex E, Case 2).

There is a larger need for different adaptation strategies (Kokorin, 2010); the ones now being discussed only consider changes that have occurred already. More creative thinking is needed that anticipates change scenarios based on current scientific findings and offers low-medium-high risk menus for differing probabilities. As noted in Chapter 6 and in the information matrix of Part I, there is a need for political and institutional structures to be brought into the process, to discuss risks of probable future climate change and its impacts on biodiversity and forests (including greater access to Arctic oil and gas and other exploitable resources).

POLLUTION OF AQUATIC ECOSYSTEMS

Chapter 2 has already highlighted the legacy of past and current practices that harm the environment; pollution of aquatic ecosystems is one that is well-documented and was also highlighted in previous assessments (Chemonics, 2005). The issues remain and, in some instances, continue with little regard for their long-term impacts. The first decree of the Russian Duma in 2010 was to allow industrial wastewater to be discharged into Lake Baikal, one of the world's most pristine freshwater ecosystems and recognized as a World Heritage Site.

The fact that Russia possesses the largest wetland system in the world, with lakes and wetlands covering 15 percent of its territory and connected by 120,000 rivers (CBD website, 2010), does not mean that it is immune to impacts from water-borne pollution. Point source pollution problems across the country are well known, and are growing, especially as they impact human populations. But they also affect the biodiversity of many of Russia's aquatic ecosystems. The ECODIT Team was apprised of the Amur River's pollution issues (as documented in the previous assessment) and how cooperation with China, which shares the river, continues, but without any concrete solutions, despite good cooperation and sharing of data at the local level. Pollution of other watercourses in the RFE directly affects invertebrates and amphibians with impacts on other species, including waterfowl, higher in the food chain. Similarly, in the Republic of Buryatiya, mining, industrial and municipal pollution from Mongolian and Russian sources in the Selenga River watershed and then in Buryatiya's capital of Ulan Ude have contributed to significant heavy metal loads and other pollutants collecting in the river's delta, a Ramsar site, as it flows into Lake Baikal. Protected area managers and others reported that studies have correlated levels of pollution with impacts on waterfowl, fish, invertebrate, amphibian, and crustacean populations there.

OVERHARVESTING SELECTED SPECIES

Overharvesting of selected species varies by region and depends on the degree of access to existing populations, the effectiveness of monitoring (and degree of corruption), and the knowledge and transparency of existing laws.

Perhaps one of the most infamous cases of overharvesting within the last decade involves Korean pine (*Pinus koraiensis*). Although this species is listed as threatened on the IUCN's Red List, Korean pine was considered a commercial species that could be cut under thinning regimes in Russia until recently. It was not until 2010, after significant Korean pine forests had disappeared, mainly in the RFE, that its existence as a truly threatened species was recognized internationally; it is now on the CITES (Convention on International Trade in Endangered Species) list as a plant species that cannot be traded/sold on international markets. The Korean Pine is part of a forest cover type that often grows in association with deciduous mast-producing species. These forests are inhabited by wild boars, Sika deer and other ungulates that are the preferred prey species of the Amur tiger and the even more endangered Far Eastern Leopard

(see Annex E, Case 7 on the Amur tiger). It is hoped that increased awareness will help habitats recover and preserve those that remain, so that the prey species and the big cats will survive this overharvesting threat.

Overharvesting and poaching of marine and freshwater species (Caspian sturgeon, Sakalin Taiman, Baikal seals for example) is also a serious threat especially in the Black Sea tributaries, the Amur River basin and surrounding estuaries, and other RFE rivers emptying into the Sea of Okhotsk from Kamchatka peninsula and Sakhalin Island.

Poaching, overhunting, overfishing are significant issues in Russia but, for the reasons noted above, they are more and more common in areas once inaccessible but now open to easy access, due to the construction of roads and rights-of-way for transmission lines and pipelines. Monitoring and control of illegal activities related to terrestrial species in particular is not uniform across the regions. Some regional laws are transparent and effective and enforcement services are better equipped to make cases that reduce future infractions. In other regions, moving from citations to arrests to sentencing is a convoluted process that only encourages disrespect and overharvesting. The Forest Code is not adequate to stem overharvesting of NTFPs.

9.2 ROOT CAUSES OF THREATS

Direct threats to biodiversity and forest ecosystems have multiple underlying root causes or drivers. These can be broadly categorized as *political, institutional, economic, external (or global), and social* causes and are affected by the prevailing socio-political context. The specific causes discussed below come from discussion and debate within the ECODIT Team, from interviews conducted with stakeholders in the course of the assessment, and from reviews of secondary data and information.

POLITICAL AND INSTITUTIONAL CAUSES

Inadequate institutional/legal framework and unclear mandates In Russia, this is manifested in the Forest Code. There is conflict between the federal level and the regions and lack of clear directions about who is responsible for what. Enforcement mandates are often unclear and can differ between regions.

Lack of effective national, regional, and municipal governments There is an inability to make key decisions and move government processes forward in a transparent manner, whether due to political conflict, lack of political will or corruption. This lack of will results in a corresponding lack of enforcement and encourages the granting of favors and corrupt practices. This has been and continues to be a major problem in the RFE and the northern Caucasus where indecision is resulting in the loss of critical habitats affecting terrestrial and aquatic biodiversity.

Need for stronger institutional capacity Forestry and protected area (PA) agencies within the federal and regional governments are generally understaffed and underfunded. Enforcement of laws and policies is also spread across many different agencies, weakening their effectiveness.

Property rights and obligations are uncertain Inadequate zoning guidelines and monitoring allows conflicting uses and infringements in many PAs. There also is a need for incentives for in-holding property owners (especially in *zakazniks*) to enhance the protective and conservation functions of the PA.

ECONOMIC CAUSES

Economic incentives that favor illegal harvesting of species over conservation Positive incentives and alternatives are needed to guide hunters, collectors, loggers and fishermen towards long-term conservation goals. Public auctions of forest concession lands that do not have complete due diligence of ownership and growing stock (inventory) are known to be

offered; authorities often lack genuine information about what is being sold and cut on forest lands; and there is often a lack of consideration for actual changes in forest conditions, which leads to further over-cutting and damage to the future wood supply. Greater transparency and more technical information to trained authorities can help stymie problems such as these.

Meager, if any, land use planning for development and growth With forest conservation management devolved to the regions, this is particularly sensitive at municipal levels. Strategies and plans that promote recognized land-use zoning principles are needed. The same is true for guidelines to monitor and enforce development within a region/municipality especially in regard to protected areas. For example, those in close proximity to population centers are feeling visitor pressures now, and the lack of proper zoning impacts visitor use, solid waste management, disrespect for boundaries, illegal fishing, collection of medicinal plants, etc.

Lack of critical technical and business skills Greater coordinated efforts are required to increase the competency of staff who manage biological resources especially in terms of management planning (using goals, objectives), PA zoning, tourism management and data sharing. Knowing how to work with visitors, crowd control, interpretation of local PA attributes, goal setting and adaptive management are tools that can help managers better manage their sites and landscapes. This is best handled with on-the-job learning as compared to study visits.

EXTERNAL CAUSES

Regional infrastructure and integration with regional markets Russia's substantial trading with Europe and China has significant impacts on the wood products industry. In the RFE, corruption levels and lack of border monitoring and the lack of political will mentioned above have contributed to significant illegal logging and cross-border trade.

Global climate change This can be a cause as well as a threat. The permafrost melting in the Russian Arctic is disrupting mating behaviors and leading to increases in erosion and sedimentation from vehicular traffic that at one time passed benignly over frozen tundra. Russia, through international cooperation and research, has a very strong potential to help mitigate the effects of climate change on ecosystems that are essential components of its economy (see Chapters 1 and 6). Better nationwide management of forest fires, black carbon emissions and GHGs from its industries will also help.

Global market forces and trends Demand for Russia's wood products in world markets has a tremendous impact on its forest management. International due diligence monitoring of these export products holds solid promise for mitigation of poor and illegal management practices.

SOCIAL CAUSES

Limited awareness, understanding and information on conservation As the fires of 2010 revealed, a great deal of the negotiating and revisions of the Forest Code has been done with incomplete knowledge and lack of public awareness or participation (although the most recent amendments to the Code had an exemplary level of public participation). Most of the population is unaware of the value of ecosystem services; nor do they understand the intrinsic value of wildlife and marine species, and similarly the effects of pollution on human health and ecosystems, both aquatic and terrestrial. The proximity of forest fires to Moscow in 2010, the international focus of the Tiger Summit in St. Petersburg and the Moscow-St. Petersburg highway construction issue have each helped to raise environmental awareness on the part of individual citizens. (Lack of awareness is largely dependent on the economic condition of populations, especially in the regions.) Can the upcoming Sochi 2014 Olympic Games and the 2012 APEC summit in areas known for unique conservation value also continue to keep biodiversity and forest issues on the daily radar?

10.0 STATUS OF CONSERVATION ACTIVITIES IN THE RUSSIAN FEDERATION

This section briefly summarizes the general status of nature conservation in the Russian Federation both inside and outside of landscapes and sites officially delineated for special status as protected areas. Issues related to federal and regional government conservation actions are discussed, along with the role of non-governmental organizations (NGOs) and external partners (e.g., USAID, GEF) that contribute to conservation partnerships in Russia.

10.1 PROTECTED AREAS

The 2005 State Report on the Environmental Status and Protection (Convention on Biological Diversity, 2010) noted that Russia's protected area system extends over 210 million hectares, nearly 12 percent of the territory of the country. More than 10 million hectares are within marine areas. At last count (CBD, 2010), there were close to 14,000 separate sites classified as protected, providing wide representation of the nation's biomes and ecosystems. The Assessment Team is also aware that scientists, NGOs and others continue to lobby federal and regional decision makers to expand the system to ensure that high value landscapes, sites and habitats come under official protection.

ZAPOVEDNIKS

Russia's 102 *Zapovedniks* (equivalent to IUCN Category I) are truly the core of the nation's PA system. For the most part, their overall integrity remains, even though their borders are not always clearly marked and there is a paucity of staff to manage and patrol them. Some are unique entities in the landscape and were created to protect and conserve particular habitats, species and landscapes. In some areas, *zapovedniks* are adjacent to other protected areas (national parks, hunting reserves, nature monuments, etc.) that provide a buffer to their own boundaries. Most are isolated and access is difficult; a few are in close proximity to large population centers.

There is also a wealth of data (although it varies significantly from reserve to reserve) associated with each *zapovednik*. Some are routine and anecdotal, and other data are very fastidious and scientific. There do not appear to be any direct linkages or easy access to many of these data. Finally, these areas are valued by a broad range of constituents (local, regional, national, and international). This means that their use will potentially be contested and logically should be debated and planned with full stakeholder participation.

OTHER PROTECTED AREAS

The degree of threats to other protected areas such as national parks, *zakazniks* (similar to the IUCN Category VI, but these require a review/renewal of their PA status every five years by the regional authorities), hunting reserves, nature monuments, etc., varies by their location and proximity to (human) population centers, previous land use and conflicting administrative jurisdictions. A more coordinated policy with clear lines of authority and enforcement between the federal and regional levels would be of significant benefit. And equally important to the integrity and conservation of Russia's protected areas resources is the adoption and implementation of internationally recognized protected area management standards and objectives. The use of zoning as a management tool is obviously known by PA staff, but its usefulness is not widely appreciated and actual implementation is not widespread.

These threats and issues are immediate and growing. Recent national-level decisions that significantly increase budgets to a set of pilot *zapovedniks* and numerous other protected areas (national parks) are both a blessing and a curse. Considerable sums of money have been

earmarked for use in PAs throughout Russia for the next three years. The Assessment Team found little evidence of any strategic planning associated with these funds. They are tied directly to developing ecotourism and environmental education at some of the PAs visited. But it was the Team's impression that most of this consisted of seed monies intended to make the PAs into money-making ventures. Because good management capacities vary among the PAs, some are more prepared to use the influx of funds wisely and productively; others are not.

Proposed legislation now in the national Duma is also a significant potential threat. The legislation, if passed, would allow tourism infrastructure (hotels, camps, etc.) to be built within *zapovedniks*, reclassify some of them as national parks and allow other designated national park lands to be removed from the system for other uses. Their Category I equivalency would be lost, but – more important – are the precedents that could be established. PAs with weak management staff, poor management plans and/or a lack of zoning that is respected by enforcement staff and regional (and municipal) authorities may put at significant risk the habitats, species and landscapes for which they were created. Compromise in situations such as this is, hopefully, the logical outcome. But planning and management that incorporate *and* implement international standards are still critical needs at the vast majority of PAs in Russia.

AN OPPORTUNITY IN THE RUSSIAN FAR EAST

The International Year of the Tiger, and the culminating “Tiger Summit” in 2010 in St. Petersburg, helped to raise awareness about the habitats and vulnerability of this magnificent species. And because the RFE is home to many of these big cats, there has been increased attention there, too. Much of this publicity has been valuable in attracting additional conservation funds, in keeping the impacts of illegal logging activities on the front pages (WWF, 2010) and also in drawing additional attention to other flora and fauna. The Amur leopard, a critically endangered species with only about 40 animals remaining, also inhabits much of the same territory as the Amur tiger. The federal government is now poised to further capitalize on 2010's events and has proposed the Land of the Leopard National Park in southwest Primorye (Anonymous, 2010). A map of this new protected area can be found in Annex F.

This national park consolidates within one boundary two *zapovedniks*, three *zakazniks* and two hunting reserves, and also establishes a special 5,000-hectare transboundary zone with a PA on the Chinese side of the border. North Korea has also expressed an interest in participating in the transboundary protected area zone. Fifteen settlements, as well as military land holdings, exist within the proposed PA border. The stated primary goal for this new national park of more than 360,000 hectares is to save the Amur leopard.

This is an enormous challenge. Staffing, currently 35 for the *zapovedniks*, is estimated to increase to 130 once the park is created. Current local conflicts with hunting associations, the regional government (which will lose land in the process), infrastructure permitting and the military all need to be resolved expeditiously. In addition, the *zapovednik's* training, public awareness and environmental education will have to be expanded considerably.

The opportunities are equally grand. This is an excellent stage to: develop participatory planning around zoning; gain experience with transboundary issues/conflicts/communication; develop standards and norms for PA management and enforcement; plan, construct and implement an ecotourism infrastructure; and work on a large scale with schools and educators focusing on environmental education tools and topics. Overall management of such an undertaking will be a critical element ... almost as much as the funding needed to do it right.

Publicity and press coverage for the undertaking are important and hopefully these will not detract from the other hot conservation topics in the region: illegal logging and tigers. The Asian Pacific Economic Council (APEC) Summit scheduled to be held in Vladivostok in 2012 will

ensure that the region remains newsworthy as well. With savvy administrators and decision makers – and a positive dose of political will – the region could very well become a leader and model for protected area management and conservation.

10.2 NATURE CONSERVATION OUTSIDE PROTECTED AREAS

Most Russian territory is outside any officially recognized protected area jurisdiction - about 88 percent of its 17,000,000 km². This vastness and the quantity of natural resources that lie within its borders contributes significantly to the psyche of how these riches are perceived by its citizens and the decision makers who control its destiny. It is precisely for these reasons that the debate and discussions about their use on the part of federal and regional governments, the private sector, NGOs and civil society are so critical. This section highlights some of the issues and problems that affect habitats and biodiversity outside of protected areas

FEDERAL GOVERNMENT

The principles of nature conservation outside the borders of protected areas are regulated by Articles 42 and 58 of the Constitution of the Russian Federation and Federal Law #7-FZ of October 1, 2002 “On the protection of the environment”. Besides that, certain mechanisms ensuring nature conservation in non-protected lands are described in Forestry, Land and Water Codes, Federal Laws on Mineral Deposits, Atmospheric Air Protection, Wildlife, Sanitary-Epidemiologic Safety, and Citizens’ Protection in the Areas affected by the Chernobyl Disaster. This top-level federal legislation is supported by a wide range of governmental acts of the federal, regional and local levels, as well as specialized rules and standards in the area of Environmental Health and Safety. Even after a recent simplification of the existing system, the legislation remains quite comprehensive but it still raises serious concerns among specialists and broader audiences regarding existing practices of law enforcement and governance in nature conservation.

The abandonment over the last decade of compulsory environmental impact assessments for most new industrial and land use projects (Chapter 4) demonstrates a clear shift towards supporting economic growth at the price of lower nature conservation standards. The overall reduction of public engagement with and awareness of the process of nature conservation, a general lack of transparency and the continued ignorance of citizens’ constitutional rights for a healthy environment over the past five years paints a disturbing trend at the national level. The summer fires of 2010 illustrated that, in the face of higher frequencies of natural disasters, this lowering of conservation standards has had severe consequences for both communities and environmental integrity.

The following types of activities, responsible for the majority of violations of environmental laws, may be considered the most important “risk factors” negatively affecting integrity and biodiversity of ecosystems:

- Unauthorized house construction, tourism and other illegal land use activities of citizens and small businesses, which are usually undertaken with total neglect of all environmental legislation and environmental health and safety standards.
- “Strategic projects” such as the construction of the 2014 Olympic Games complex in Sochi, the 2012 APEC Summit infrastructure in Vladivostok, natural gas pipelines in Siberia and RFE, etc.
- Privatized industrial facilities dealing with hazardous and toxic products and wastes – after bankruptcy or abandonment, contaminated areas and toxic wastes are not removed.

- Illegal logging and mining (especially gold mining) resulting from reduced legal protection for forests of high conservation value.
- Alternative land use within former military areas, which often contain unknown types of contamination.

Some hopes for improving the situation are linked with more active integration of Russian businesses into world markets, which will require compliance with international environmental standards. Other examples include the recent increase of public involvement during the severe forest fires of 2010, the protests over the construction of the new highway to St. Petersburg through forests near Khimki (Moscow region) and public campaigns to protect tigers, polar bears, whales and seals. Although these activities are not systemic so far, they serve as good examples of dialogue between the state, businesses and citizens on improving nature conservation in Russia. A promising “next step” would be to actively engage independent environmental NGOs (and their trained staff) in the discussion process and as members of a joint decision-making panel with businesses. This would be an important step in improving public participation in addressing conservation issues and resolving conflicts over environmental management.

Recent activities of the federal authorities, such as the formation of Public Environmental Councils in some ministries, or bringing environmental issues to the agenda of the State Council of the President of the Russian Federation, which happened recently, creates some optimism that environmental policy will improve and will be implemented more effectively. But, in contrast, the government has adopted special Federal laws for the 2012 APEC summit and 2014 Olympic Games which have created loopholes in existing environmental legislation. This is illustrative of the dichotomy that exists at the Federal level relative to conservation problems and is ominously reminiscent of many elements of Soviet-era government.

REGIONAL GOVERNMENTS

Regional governments are supposed to be responsible for large scale conservation activities in all sectors of the economy, from emissions reduction to increasing environmental awareness and establishing a green economy. As part of the decentralization of environmental responsibilities, regions were granted greater authority to manage protected areas and to help establish them. Regional environmental strategies were also supposed to be prepared to give more cohesiveness and coordination to all environmental actions within their borders. As of today, such strategies contain unfunded mandates and lack concrete mechanisms for implementation. Some regions have fared better than others but, overall, the lack of manpower and funding means that conservation activities in the regions are low priority; enforcement of laws on overharvesting, collection, and poaching is ineffective; and regional jurisdiction and authority for conservation and protection of forests and biodiversity has decreased from what it was five years ago.

NGOS

The level of NGO activities outside protected areas has increased over the past one or two years, but remains low (compared to activities within PAs). Activities are mainly related to environmental education and ecotourism development. However, both national and international support is dwindling. Some very localized actions – such as recent protests against the construction of the East Siberian Pacific oil and gas pipeline (2005-06), the introduction of the new forestry code (2007) or the protection of the Khimkinsky Forest against cutting (2010) to build a new highway from Moscow to St. Petersburg have resulted in repression of environmental activists by both businesses and government authorities. NGOs today find that the only avenues they have to influence environmental policy are either: (a) to be vocal enough

so that they can be heard by the highest Russian officials, or (b) to develop a close working relationship with the authorities, which threatens their objectivity.

PRIVATE SECTOR

IKEA and other private enterprises that sell forest-based products in international markets are increasingly aware of the importance of having transparent and sustainable forest management practices associated with their brand. This has created some tension inside Russia to resolve issues about due diligence of supply chains and the source and origin of forest products – important elements in helping to address illegal logging issues. However, other private sector firms are generally not interested in any conservation activity unless it is required, is unavoidable (when bribes and penalties are higher than profits), or it is a condition to receive international investments. The change of the Sakhalin oil field operator from Exxon-Mobil to Rosneft in the mid-2000s, for example, resulted in a drastic change in the environmental policy and social responsibilities program. (The explanation in this instance was that taxes are paid by the company and nothing else is required.)

The official policy on promoting economic growth includes support for conservation and nature protection, but it is mainly on paper and is used to help encourage economic growth. In reality, government cooperation has often just been a thin veneer. Minor positive shifts are related to increasing the profitability of businesses, especially in the energy sector, with what is normally associated with reducing consumption of resources and emissions. Hope in the early 2000s was associated with the widespread environmental certification of businesses. This was, in fact, supported by the USAID-funded Replications of Lessons Learned (ROLL) program for ISO 14000 norms. Today, the constant delays in Russia's attempts to join the World Trade Organization do not encourage enterprises. Those particularly affected are working for the domestic market, as they try to improve their environmental management standards. A recent series of incidents at Russian enterprises (e.g., the 2009 Sayano-Shushenskaya hydroelectric power station incident, the Moscow Gas pipeline blast in 2009, over 4,500 gas pipelines breaks in 2008, etc.) demonstrate the increase of techno-threats to the environment. The absence of a coordinated national and corporate strategy to reduce these risks means that a serious threat to the environment and society is not going away.

10.3 CURRENT PARTNERSHIP ACTIVITIES

As noted elsewhere in this ETOA, Russia is no longer seeking technical assistance from external sources. Instead, it is encouraging partnership opportunities, especially those of a broad scale and particularly ones that have a private sector element. NGO activity, with a few chosen exceptions, is not encouraged. This section provides a brief review of conservation activities supported by USAID, other US government entities and other partners. More details on these activities are given in Attachment 1.

USAID AND OTHER USG AGENCIES

USAID/Russia has helped fund some biodiversity conservation activities in the country (see also Chapter 13). There is some funding for Russian natural resources management and biodiversity from USAID regional and global programs. The BPC also works with USAID, Russian partners and others through its Environment Committee to coordinate funding of some activities.

The largest collaborator of USAID support to biodiversity and forestry is the US Forest Service (USFS)⁴⁷. Efforts have focused largely on sustainable forest and protected area management,

⁴⁷ In 2010, USAID provided \$477,250 as an earmark plus \$200,000 for reducing illegal logging. USFS' own funds totaled \$225,000.

habitat management, ecotourism, salmon conservation (through the Wild Salmon Center) and the development of watershed councils (see section 2.2). Topics of collaboration with Russian counterpart agencies (mainly the Russian Federal Forest Agency) have included GCC, fire management, illegal logging and voluntary certification. The USFS has concentrated most of its work in the Lake Baikal area and in the RFE in Kamchatka, Sakhalin Island, and Primorye.

USAID (2010) also recently pledged \$500,000 in new funding for the protection of tigers and their habitats in Russia. Included in these funds is a \$400,000 grant to the Wildlife Conservation Society's Russia Program to improve enforcement in four protected areas, as well as to strengthen biological monitoring and to facilitate information exchange between wildlife management officials. The balance of the new funds will be used to support law enforcement efforts related to habitat protection and tiger conservation.

There are several other US Government entities active in biodiversity conservation partnerships with Russian counterparts. Their funding is considerably less than that for the USFS program, but each contributes in unique ways. The US National Park Service has sister park relationships with several Russian PAs and pools funding with the US Fish and Wildlife Service (USFWS) to train protected area managers through short course programs (in the US). The National Park Service also works with Russian researchers looking at ungulate species diseases and climate change issues related to glaciation.

The USFWS has a sister program linking US wildlife refuges to specific protected wetland areas in Russia. They have also worked with Russian counterparts examining water quality issues for fish populations in the Amur River and Lake Baikal and have assisted with tracking migratory birds that use the Arctic-to-China and the Arctic-to-US (West Coast) flyways. USFWS' Tiger/Rhino fund has also assisted Russian counterparts and NGOs with conservation education materials about tiger habitats in the Primorye Region. Their Species of the World program has also provided conservation grants in Russia. Other assistance has been aimed at polar bears and other marine mammals in order to raise awareness and help establish norms for subsistence hunting and preserve critical salmon habitats.

OTHER PARTNERS ENGAGED IN BIODIVERSITY CONSERVATION

Based on the global value and importance of biodiversity in Russian ecosystems, GEF has been supporting conservation projects in the country for over a decade. A majority of these projects are being implemented by UNDP (United Nations Development Programme), with total GEF financing over US\$40 million. Current projects are listed in Attachment 1.

The UNDP/GEF strategy for its biodiversity conservation portfolio in Russia relies on an ecosystem approach and on innovative pilot conservation projects in globally valuable eco-regions. Five out of eight natural heritage sites in Russia included in the UNESCO (United Nations Educational, Scientific and Cultural Organization) World Heritage List are covered in the UNDP/GEF biodiversity conservation portfolio. These projects are implemented in partnerships with the Ministry of Natural Resources and Environment of the Russian Federation, Federal Agency for Water Resources, Federal Forestry Agency, Federal Agency for Fisheries, regional administrations, PA authorities, scientific and research institutes, universities, academia, Russian and international environmental NGOs, media, and the business sector.

These projects supporting the Russian PA system take an integrated approach and seek solutions to a wide range of issues. These include:

- Strengthening the network of protected areas in key eco-regions;
- Optimizing regional PA systems to increase their "representation" and expand coverage for the most significant ecosystems;

- Improving management efficiency, technological capacity, and qualifications, and well as building interagency mechanisms for management and conservation;
- Strengthening the PA legal framework;
- Assessing the economic value of PA resources and services so as to integrate them into socio-economic agendas;
- Increasing financial sustainability of the PAs through the development of ecotourism, creation of revenue generating tools and business planning;
- Mitigating threats to biological resources related to economic activity and illegal hunting by strengthening surveillance and developing alternative sources of livelihoods for the local population;
- Supporting educational and awareness programs and public private partnerships for PA conservation activities; and
- Developing constructive dialogue between PA authorities and users of resources.

UNDP projects in biodiversity conservation address, to some extent, the issue of sustainable use and mainstreaming of biodiversity considerations into economic planning and policy-making. For instance, an analysis of water use and draining in the Volgograd hydroelectric power station is being conducted under the UNDP/GEF project in the Lower Volga region, to eventually minimize their negative impact on the biodiversity of the Volga-Akhtubinsk flood plain. A project in Kamchatka for the conservation and sustainable use of wild salmon takes a mainstreaming approach and aims to integrate biodiversity conservation principles into local commercial and recreational fishing activities. UNDP/GEF projects also support small and medium enterprises encourage ecotourism and make economic assessments of biological resources and of the anthropogenic impacts on the environment.

With UNDP/GEF support, Russia has been participating in international and regional projects that address protection and the integrated management of transboundary water resources (in the Caspian and Black seas, Dnepr River, Tumen River in the Far East, and Peipsi/Chudskoye Lake (on the Russian border with Estonia). These are conducted jointly with neighboring countries and support integrated sustainable management of transboundary water basins.

New projects for transboundary water resources management involving the Russian Federation are currently under preparation by UNDP. They include the third phase of the Caspian Environment Program and a new joint project between Russia and Mongolia to reduce pollution levels and protect biodiversity in the Baikal Lake Basin. The objective of the Baikal project is to reduce pollution from persistent toxic substances and nutrients through an integrated management of the basin. It will mobilize the governments of both countries, the private sector, local communities, NGOs and research institutes.

UNDP, with financial support from the German International Climate Initiative, is implementing two projects in the Altai-Sayan Eco-region and in Komi Republic on forest management and conservation. The projects will support the following activities:

- Assessment of carbon sinks, carbon sequestration data and emission fluxes;
- Nature-based adaptation/ecosystem resilience;
- Protected area networks and corridors;
- Protection of forests from fires; and
- Monitoring of climate impacts, ecological and adaptation indicators

In the upcoming Phase 5 of GEF, UNEP and the Russian Federation are proposing to develop a programmatic approach to conservation in the form of the GEF-Russian Federation Partnership on sustainable environmental management in the Arctic (“Arctic Agenda 2020”). UNEP/GEF is now preparing the project “Improvements of biodiversity conservation and effectiveness of protected areas in the Russian Arctic under changing climate”. The project is planned to enhance biodiversity conservation and effectiveness of biodiversity management and monitoring as well as to improve natural protected areas’ management and financing systems.

10.4 ASSESSMENT OF THE EFFECTIVENESS OF CONSERVATION ACTIVITIES⁴⁸

Based on the Team’s site visits and discussions held during the assessment, the overall effectiveness of conservation activities in Russia has seemed to be “hit or miss”.

The Team is aware that some of the best success stories stem from the efforts of NGOs, a sector of civil society that the federal government is trying to distance itself from and cast in a bad light. World Wildlife Fund-Russia and the Wildlife Conservation Society, large NGOs with significant global backing, are listened to and also have positive public awareness programs and substantial funding. Their efforts, especially in the RFE with large mammal populations, habitat management, anti-poaching work and awareness about illegal logging, have been successful over several years. Other, smaller NGOs have also made important inroads with their messages, specialized assistance, and awareness materials, despite their meager budgets and small staff. They help to keep the importance of biodiversity conservation and its management visible in their small zones of influence.

Within PAs, conservation remains at serious risk due to inadequate government budgets and staffing, a lack of coordination and information exchange of basic ideas, lessons learned, and data management. There is also lack of modern, world standard PA planning and management at most of the sites in the system. Long-term management-by-objective planning, adaptive management, zonation, participatory planning, etc. are known concepts, but their actual application and use on a daily basis is very rare. Without these forward planning tools, PAs are much more vulnerable to weak legislative policy, land use conflicts, budget swings, and political fancy. However, there are several optimistic elements, including the pilot efforts to increase ecotourism opportunities and raise greater awareness through environmental education; but, given the lack of long-term planning and participatory zoning exercises, these may end up being damaging to long-term conservation efforts. PA managers and other key decision makers are unable to provide big picture concepts or show the consequences of if/then scenarios. Without long-term objectives and regular monitoring of management activities, continuity is lost especially for periods of five or ten years, which are but baby steps in ecological landscapes.

Population pressures are also growing in and around many PAs, especially those close to major cities. This increases the demand for eco-tourism and recreational opportunities, with a potential for revenue collection, but also may lead to excessive pressure for outright commercialization and degradation of the ecological resources, unless appropriate infrastructure (drinking water, wastewater disposal, solid waste collection, parking and visitor centers) can be provided and a protected area ethic established through public education.

Efforts are also underway to consolidate *zapovedniks* with other protected areas under a joint management umbrella. The assessment team saw evidence of this in Buryatia, Khabarovsk and

⁴⁸ The Team had limited exposure to the GEF initiatives just mentioned; it did not visit any of their project sites, nor did it have access to government officials who were willing to address this cooperation.

Primorye. But this can only be cost-effective and also make sense from a management perspective if there are appropriate staff and budgeting as well. It is essential that forward-thinking, participatory planning and implementation accompany these transitions.

Red listed species (see Attachment 4) may also serve as good proxies for the overall health of biodiversity conservation in a region. Because many of these (red book listed) species have strict requirements for habitat quality, the State should protect the area as soon as possible after they have been identified. One of the most familiar (since the Year of the Tiger celebrations) is the Amur Tiger, which has habitats that cover almost all of Primorskiy Krai. (See the Tiger case study in Annex E, Case 7). In addition to the Federal Red Data Book, there are more extensive lists of locally protected species included into each region's red book. However, regional laws are weaker and probably leave the species more exposed to over-collection and less protected. Despite this weakness, there is still a legislative basis to protect the habitats of these species.

Outside of PAs, there does not appear to be an overall positive movement for conservation. The Forest Code and other federal-level legislation and policy connected to the environment, biodiversity, forestry and land-use are in serious conflict. The devolution of management responsibility to the regions has, in most cases, resulted in a proliferation of problems due to lack of staff, budget and government worker morale. Lines of authority and enforcement are inconsistent and blurred, and there is a lack of clear direction and coordination of conservation management responsibilities. Some regions fare better than others, when there are good managers with sufficient resources and a disposition to work with civil society, but the overall lack of coordination and vision nationally across such a vast territory means that ecosystems, habitats and biodiversity will continue to be at risk in a "hit or miss" environment.

The Russian Federation's policy to curtail assistance from international entities and to actively discourage civil society/NGO efforts at conservation also greatly limits opportunities for positive gains in conservation. Taken together with global climate change looming large across the country and with the elements mentioned above, the overall status of biodiversity and natural resources management in Russia is precarious.

11.0 CAPACITY OF THE GOVERNMENT OF RUSSIA INSTITUTIONS TO ADDRESS THREATS

Despite the precarious state of conservation management in Russian governmental institutions today, the country does have the capacity to address most of the threats discussed in Chapter 9. It certainly has the resources, if used wisely and judiciously, to undertake many of the mitigation actions that will be required. But whether it has the necessary political will is the largest question.

The determination of a few activists has shown that positive outcomes that benefit biodiversity and the environment are possible. A gas pipeline was rerouted from ecologically sensitive areas near (and including one alternative that actually proposed crossing) Lake Baikal to a more benign location. Forces and funds have been rallied to help conserve the Amur tiger and protect its habitat (see also Case Study 7 in the Annexes). And a new, quite visible, transboundary protected area is proposed on a fast track for implementation in order to conserve habitat and save the critically endangered Amur leopard.

Illegal logging remains a serious problem. The actual numbers vary, but estimates suggest from 20 to 70 percent of logging in the RFE is illegal (Sheingauz, 2004). Percentages tend to be higher in more isolated regions, where government oversight is most limited (GFTN-WWF, 2009). However, bribery and deception continue because of the corruption of many within the government services and the largely unregulated global market demand for forest products with little regard for their source and origin. The latter is slowly being improved, due to the European market's greater insistence on employing FLEG standards and the US amendment to the Lacey Act banning commerce in illegally sourced plants and their products (including timber, wood and paper products). Russia's forest industry is slowly being forced to comply, but corruption permeates the supply chain and, until leadership in the regions and at the federal level takes positive action, illegal logging will continue.

The 2007 Forest Code is arguably the largest threat to biodiversity and sustainable forest management in the country but reforming it is a highly political issue. Technical specialists, government decision-makers, NGOs, and the Russian citizenry all recognize that it is seriously flawed. As mentioned in Chapter 8, there has been a recent round of new amendments that illustrate progress in correcting some of its more serious flaws. In the meantime sustainable forest management and the nation's biodiversity will continue to bear the brunt of the shortcomings.

The capacity of regional governments to address critical threats to conservation varies across the country. Some, with better management and leadership, have been successful at marshaling resources, working with civil society organizations, capitalizing on academic resources and working with NGOs to address critical conservation issues. Others are less cooperative or lack genuine information of the true scale of environmental problems within their territory, which means that scarce human and financial resources are focused elsewhere. This is also where capacity is the most critical, near to the resources that need protection and management. But to be effective on a national scale, strategic planning, coordination and active management are needed.

Key government institutions engaged nationally in the management of Russia's forests and protected areas are the Federal Forestry Agency and the Ministry of Natural Resources and

Environment (MNRE). The weak management, administrative and coordination ability of the Federal Forestry Agency was revealed following the outbreak of the forest fires in European Russia in 2010. A recent shake-up of the Agency has resulted in its now reporting to the Government of the Russian Federation. Its capacity to independently lead efforts to conserve and sustainably manage the territory's vast forest resources is not yet proven.

MNRE, which has (potentially conflicting) responsibility for management of both the federal PA system and for geological exploration and mineral resources licensing, may also be lacking capacity to address the threats identified in this assessment. The lack of modern management systems, with globally recognized tools for protected areas, is also a worrisome problem observed by the Assessment Team. At present, the Ministry does not have the capacity to plan, coordinate, and implement activities needed for the successful long-term management of many of these protected areas. Staff is limited and underpaid, budgets for most needs are low, and enforcement/patrolling capabilities suffer. There is little coordination or sharing of ideas, lessons and data across the protected area system; and, in some instances, the technical capacity of the management staff is low. Many PAs are under growing visitation and use pressures from nearby populations. Conflicts with municipal governments, PA users, and local citizens dependent on them for their livelihoods are mounting. In most cases, no viable strategies or long term plans are in place either to resolve these conflicts or to define specific objectives for the future. The entire protected area system will suffer and the landscapes, ecology, habitats and species they contain will be in jeopardy, unless more immediate and direct attention is provided to increase their overall management capacity.

The Government of Russia is aware of the existence of these serious problems. Prime Minister Putin outlined many of them just prior to this assessment exercise, and suggested several steps to begin addressing them. These steps were even more noteworthy because he stated that a fundamental condition for the development of PA areas is the participation of civil society and NGOs. This realization could have substantial impact if it is incorporated into approved legislation. Mr. Putin also called for improvements in the development of ecological tourism, recognizing the educational value of these resources and also the PA's value as a source of revenue – elements that are discussed in other parts of this report (Chapters 6, 10, 13).

Linked to this is an integrated concept being developed by the MNRE for the development of new and existing protected areas. Unfortunately, much of the emphasis is on creating more nature reserves (10), national parks (10) and expanding the territory of others. These goals are admirable and can potentially add valuable habitats and landscapes to the PA system but, unless concrete steps are taken now to address the more immediate management concerns facing forest and biodiversity conservation, implementing these plans will further weaken management of the PA system as a whole.

It is certainly encouraging that political leaders are helping raise awareness of the importance of nature conservation in Russia and pointing out some of the critical problems confronting the environment. But greater attention has to be given to the coordination and management involved in solving these fundamental issues and problems, too. Perhaps the country's very real and serious risk of being overtaken by climatic changes will be a rallying point for government decision makers. The large expanse of Arctic ecosystems within its borders is probably the most vulnerable. Without the capacity to manage and mitigate the changes occurring there, the economy will certainly falter.

12.0 PRIORITY CONSERVATION NEEDS AND ACTIONS NECESSARY TO CONSERVE RUSSIA’S BIODIVERSITY

After examining the threats to biodiversity, reviewing the ongoing conservation activities in Russia and assessing the government’s own actions and capabilities, this chapter outlines the gaps and actions that are still needed to conserve biodiversity in the country. It responds to the FAA 119 with a matrix of actions necessary to address the key threats to biodiversity conservation.

Four overarching themes (see box) that fit within the framework are listed as important steps that the Russian government needs to take to respond to urgent conservation needs.

Next, using the information gained in this assessment from the team’s discussions, an examination of current activities, interviews, and information from secondary sources, we present a more extensive matrix of ideas/actions needed to address these threats (Table 12.2). The table is organized by the key threats presented in Chapter 9: **habitat conversion/loss; global climate change; pollution of aquatic ecosystems; and, overharvesting of certain species**) These actions are accompanied by an associated list of responsible institutions and leaders, as well as areas of the country that would benefit most directly from these actions.

Finally, these priority actions are discussed relative to the eco-regions identified in Chapters 7 and 9. A simple index filter is used to show regions where investments (by Russia, USAID and/or other partners) might be prioritized based on current land use/development pressures and intrinsic high biodiversity and conservation value.

Conservation Actions Needed (by theme)

Political and institutional actions

- Develop an adequate legal and policy framework (e.g., Forest Code)
- Apply and enforce laws and regulations transparently
- Improve/clarify access, rights and tenure over land and natural resources
- Establish clear, transparent data collection and monitoring systems with institutions for resource use.

Economic actions

- Improve planning capacity for environmentally and socially sustainable development
- Improve business skills and capacity and data transfer
- Increase positive incentives while removing perverse ones

Actions to address external pressures (or global threats)

- Maintain and strengthen national participation in global climate change and biodiversity treaties, negotiations and mitigation mechanisms
- Develop safeguards for forest industry production for international markets.

Social actions

- Improve civil society participation in environmental decision making through access to information, communication and environmental education
- Change unsustainable practices and behaviors through public information, education and social marketing campaigns.

12.1 BROAD ACTIONS

Actions needed to reduce direct threats to Russia’s biodiversity and forests should focus on all of the root causes and drivers of the threats presented in Chapter 9. The box illustrates the broad types of actions Russia can take to address the main threats identified in Chapter 9 under four overarching themes: political and institutional; economic; external; and, social causes.

Some of the partner activities presented in the previous chapter and others summarized in Attachment 1 address directly some of the actions needed; others are not being addressed.

The ETOA Team would like to highlight four overarching actions that the Russian Federation should consider as a first priority:

A nationally accepted and approved Forest Code is needed to guide forest land strategies not only at the federal level but also to provide a uniform standard for coordination and management across the regions. Roles and responsibilities need to be clear to provide a base from which to build national land use strategies and plans. Participation from all stakeholders is needed. Responsibilities (and budgetary relationships) between the national and regional levels need to be clearly defined, practiced, and monitored. [Political/Institutional]

A protected area strategy needs to be defined and implemented with a participatory action plan, to ensure that internationally recognized protected area management methods and tools are used and respected across the territory and apply to all levels of PAs. [Institutional]

Incentives must be put in place to improve the integrity and economic health of the forest sector. Illegal logging is not just caused by demands for forest products. Corruption occurs at all levels and awareness, publicity, information, and incentives must be transparent and ubiquitous to improve governance and help stymie corruption [Economic and External]

Land rights, tenure and ownership needs to be clarified with incentives given at the regional and municipal level to ensure good land stewardship. A comprehensive system of Environmental Impact Assessments (EIAs) for all new investments needs to be reinstated. Conflicts arising from uncontrolled construction and tourism development need to be resolved and reined in, as the current uncertainty encourages corruption and seriously threatens wise and sound land use. [Institutional and Social]

12.2 IDEAS/ACTIONS NEEDED TO ADDRESS THESE THREATS

The actions outlined in the table and the opportunities for USAID/Russia partnerships described in Chapter 14 all fit within the four broader themes identified as priorities in the assessment.

TABLE 12.2 SELECTED PRIORITY ACTIONS NEEDED TO ADDRESS KEY THREATS TO BIODIVERSITY CONSERVATION

ADDRESSING THREATS DUE TO HABITAT CONVERSION/LOSS

Cause/Driver	Actions Needed	Actors	Geographic Focus
Political/institutional Inadequate institutional/legal framework & conflicting mandates for forestry & land use law, regulations & standards	Develop effective & clear laws & policies, in particular, revise the Forest Code Strengthen inter-institutional communication, roles & responsibilities of management between the federal and regional governments Establish forest management standards at regional level & provide administrative oversight training on technical forestry issues	National and regional dumas, Federal Forestry Agency, Justice, regional administrators, civil society/ non-governmental organizations (NGOs)	Country-wide
Political/Institutional; Unwillingness in national, regional & municipal governments to make key decisions & move forward in a transparent manner	Develop a political will to deal forthrightly, fairly, and visibly with issues and problems affecting forests & biodiversity Identifying & protecting important intact habitats Reinstitute EIA for all projects	Government administrative leaders and managers Civil society, NGOs, media following the Prime Minister’s lead Institutions & universities	Country-wide with emphasis on the Caucasus, Lake Baikal region and the RFE
Political/Institutional; Very weak capacity to monitor forest harvesting, land use change (e.g., real estate development) and conservation actions to provide timely information for enforcement	Strengthen government services, especially in the regions, with greater manpower, budgets, equipment & training Establish effective & transparent data collection & monitoring systems	Regional and municipal governments Civil society and NGOs Institutions & universities	Country wide, but with emphasis on northwestern Russia, Caucasus, southern Siberia and the RFE
Economic: Insufficient economic incentives for sustainable forest management, avoided deforestation, conservation including private lands	Revise national/regional laws & policies to include economic incentives for conservation & sustainable use including those on private lands and harsher penalties for non-compliance Promote sustainable economic use of forests & biodiversity in local communities	Regional and municipal NGOs and private sector (through public private alliances)	Country-wide
External/global: Global Climate Change (GCC) Lack of recognition of the substantial impact GCC is having and will have on habitat changes.	Establish a national body to develop, implement and oversee/monitor a national strategy and clearing house for coping with GCC Establish similar regional bodies with clear linkages to the national clearing house Promote/participate in REDD+ or Land-Use, Land-Use Change and Forestry (LUCLUCF) mechanism	Proposed National Center for Climate Change (Chapter 1) All government environmental ministries Institutes and universities International think-tanks Bilateral Presidential Commission (BPC)	Country-wide with an immediate focus on the Arctic and other vulnerable/sensitive areas that already are experiencing changes linked directly to warmer temperatures
Social: Limited awareness of role of private sector land clearing/forest fragmentation on forest and biodiversity degradation Limited awareness of forests in providing ecosystem services	Revise property right laws to give more incentive to enhance protective & conservation function of important habitats Continue campaigns and encourage public participation in forest fire management strategy, habitat management & roles of PAs Raise awareness of the role of forests in providing ecosystem services & importance of continuity of forest cover	Federal & regional government institutions involved in land use functions Civil society/NGOs Institutions & universities	Country-wide

ADDRESSING THREATS FROM GLOBAL CLIMATE CHANGE

Cause/Driver	Actions Needed	Actors	Geographic Focus
Political/Institutional; Unwillingness in national, regional & municipal governments to make key decisions & move forward in a transparent manner	Establish a political will to deal forthrightly, fairly, and visibly on decisions related to GCC	All government environmental ministries Institutes and universities International think-tanks BPC	Country-wide
External/global: Climate change	Establish the National Center on Climate Change to develop, implement and oversee/ monitor a national strategy and clearing house for coping with GCC Establish similar regional bodies with clear linkages to the national clearing house	All government environmental ministries Institutes and universities International think-tanks BPC	Country-wide with an immediate focus on the Arctic and other northern vulnerable/sensitive areas (e.g., areas of permafrost) that already are experiencing changes linked directly to warmer temperatures Lake Baikal
Social: Lack of public awareness and understanding	Promote visible, honest and science-based awareness campaigns by respected and trustworthy scientific and civil society groups	Civil society/NGOs Institutes and universities	Country-wide

ADDRESSING THREATS DUE TO POLLUTION OF AQUATIC ECOSYSTEMS

Cause/Driver	Actions Needed	Actors	Geographic Focus
<u>Political/institutional</u> Gaps in pollution laws, standards and regulations Lack of complete disclosure of types and extent of pollution	Development of community standards & agreements for controlling pollution Development of 3rd party environmental units in municipalities for monitoring & enforcement; Specific ordinances & standards, including best available technologies, to control pollution	Ministry of Natural Resources and Environment (MNRE), regional public health authorities municipalities & NGOs Research institutes Private sector monitoring firms	Country-wide
<u>Political/Institutional</u> ; Unwillingness in national, regional & municipal governments to make key decisions & move forward in a transparent manner	Catalyze political will to deal forthrightly, fairly, and visibly on issues and problems affecting aquatic ecosystems, plus budgets and staffing adequate for monitoring and enforcing	Government administrative leaders and managers Civil society, NGOs, media	Country wide but especially in highly-industrialized regions and marine habitats
<u>Economic</u> ; Government reluctance to accept heavy costs of pollution control	Indexing of fines and their enforcement to provide economic disincentives Clean production & pollution prevention approaches to minimize contamination of surface & ground-water resources	MNRE and municipalities	Country-wide but with a focus on heavily impacted enclosed water bodies, such as the Black Sea, Vladivostok region and highly sensitive environments like Lake Baikal.
<u>Social</u> ; Lack of public awareness on extent of pollution and effects on aquatic ecosystems	Awareness and information campaigns targeting specific types of pollution perhaps on a watershed by watershed basis	Municipalities, NGOs, Institutes, universities and high schools engaged in analyses	Country-wide

ADDRESSING THREATS FROM OVERHARVESTING CERTAIN SPECIES

Cause/Driver	Actions Needed	Actors	Geographic Focus
<p><u>Political/institutional</u> Weak institutional management capacity</p>	<p>Provide additional staffing, budget & equipment for training & enforcement Develop a monitoring network of independent 3rd parties Incorporate more due diligence monitoring capacity particularly at the regional level</p>	<p>Federal Forestry Agency, MNRE, Regional enforcement authorities, NGOs</p>	<p>Habitats at risk to be identified, but most critical in Caucasus, Russia Far East for CITES & Russian Federation Red List species, especially marine habitats</p>
<p><u>Economic:</u> Economic incentives that favor illegal harvesting of species over conservation Lack of alternative livelihoods for local communities</p>	<p>Revise national and regional laws to included economic incentives for conservation & sustainable use Provide positive incentives & alternatives to guide hunters, loggers, collectors & fisherman towards long-term conservation goals Pilot test of payment for ecological services concepts</p>	<p>National & regional Dumas, MNRE International and Russian NGOs & private sector</p>	<p>Country-wide habitats at risk as identified</p>
<p><u>Social:</u> Lack of public awareness and understanding of role of individual species in ecosystem health</p>	<p>Public awareness and information campaigns targeting specific species in areas where they are found and are causing harm</p>	<p>MNRE, regional government services responsible for enforcement, PA managers, NGOs private sector, media</p>	<p>Country-wide habitats at risk as identified</p>

12.3 ACTIONS VIS-À-VIS PRIORITY ECOREGIONS

The general conservation actions needed and the priority actions required to mitigate key threats as presented in Table 12.2 note that the geographic focus is often country-wide, meaning that if the actions are undertaken the benefits will be national in scope. But there are also more specific foci listed in the table and these stem from the specific examples provided in Chapter 7 and Chapter 9.

In Chapter 7 eco-regions were ranked according to their relative biodiversity values (including endemism and endangered species). Another ranking of these same 44 regions illustrated the degree of conflict (from resource use, land use change, development) with biodiversity.

Table 12.3 provides an abbreviated list of the 44 regions. It combines the biodiversity value and resource conflict scales to provide an index that points regions where the consequences of development actions on biodiversity can be the most severe. Six of the 44 regions have index values of 9 or higher. The remaining 39 had indices of seven or lower. In terms of investments in biodiversity conservation activities, Table 12.3 may provide a helpful filter for decision makers and funders in prioritizing actions. (One should also keep in mind that many of the other eco-regions may have specific *causes célèbres* that warrant attention and protection of specific habitats or species.) The eco-regions listed in Table 12.3 contain biodiversity that is highly significant and should be afforded priority status for protection and conservation actions given the threats currently faced in those areas.

TABLE 12.3 ECO-REGIONS WITH HIGH BIODIVERSITY VALUES AND CONFLICTS WITH RESOURCE USE

ECO-REGION		Area (‘000 km ²)	Biodiversity Value and Development Conflict “Index”
No.	Region		
6	Forests and mountain tundra of Kuril Islands	21.1	9
10	Tundra of northeast Asia	636.0	9
38	Mountain taiga and steppe of Altai, Sayon, and eastern Tuva upland	392.9	10
39	Mixed broad-leaved forests and forested steppe of the Russian plain	779.2	9
40	Middle and southern taiga of the southern Far East	772.5	14
44	Mountain broad-leaved forests and upland steppe of the Caucasus	201.4	14

Source: WWF, 2001

13.0 EXTENT TO WHICH USAID/RUSSIA'S CURRENT AND PLANNED ACTIONS MEET THE CONSERVATION NEEDS IDENTIFIED

The Foreign Assistance Act 119 (Attachment 2) requires that this Assessment discuss “the extent to which actions proposed for support by the Agency meet the needs thus identified”. The degree to which the Assessment Team was able to address this question is based on the limited and preliminary information about the new strategy provided to the Team. Our review of activities for conservation of biodiversity and forests in Russia is an attempt at providing logical and good fit opportunities within USAID/Russia's portfolio. Past and current programming figures prominently, as does the emphasis on southern Siberia and the Russian Far East. Existing partnerships with Russian ministries and other institutions also influence the analysis. Chapter 6 makes some specific proposals for the USAID/ Russia Mission Strategy; this chapter provides additional context for those proposals, especially Opportunities #1 and #2 on forestry and biodiversity conservation respectively.

13.1 EXTENT TO WHICH CURRENT ACTIONS MEET IDENTIFIED NEEDS

Russia is a vast country with a multitude of biodiversity and environmental conservation issues. Table 13.1 uses the causes of identified threats to biodiversity from Table 12.2 to show where current USAID actions are helping to mitigate the causes listed. It is obvious from the activities listed in this table, and from Attachment 1, that USAID is a relatively small actor within this mix and needs to be quite selective in order to make its investments effective and catalytic.

Most of USAID's current activities address priority issues other than biodiversity conservation. There are a couple of notable exceptions. USAID funds US Forest Service partnership activities (USFS, 2010) in Russia through a Participating Agency Service Agreement (PASA) that address some needs in biodiversity conservation directly and provide important indirect support, through its main focus on sustainable forest management. The current PASA funding has also been used to provide grant support to the Wild Salmon Center for its work with protecting salmon habitats in the Russian Far East. The USFS activities are discussed in more detail elsewhere (Chapters 5, 6 and 10) in this report.

USAID/Washington, via its Development Grant Program (DGP), provides funds to Russian NGOs for specific programs. For example, the Center for Environmental Innovation has received a DGP grant for “Climate Change Adaptation and Mitigation Strategies in the Forest Sector of the Russian Regions of the UNESCO World Heritage and Biodiversity Centers.” Similarly, Transparent World has recently received a grant for “Intensified and Sustainable Forest Management in Russia” through grant mechanisms to NGOs. Other recent USAID global funding also fund activities in the Russian Far East (USAID, 2010) through the Assistance to Europe, Eurasia and Central Asia (AEECA) account is helping to address strategies for tiger and leopard conservation being implemented by an NGO in the Russian Far East, protect salmon habitats, work with anti-poaching programs and provide law enforcement support. These again are actions that indirectly address the identified conservation needs.

There are other USAID investments – Community Development Support Program (CDSP) and the Amur River Initiative – that indirectly address habitat conversion/loss and pollution threats and global climate change mainly through local community/municipality efforts (Chapter 5). USAID's actions with the Bilateral Presidential Commission's Environment Committee, most notably those related to forest fires and climate change, also indirectly address the conservation

needs outlined in this report. These include increasing the transparent lines of communication, helping to raise national and global awareness of these issues, and working with Russia institutions charged with decision-making responsibilities related to fires and climate change.

TABLE 13.1 USAID ASSISTANCE THAT ADDRESSES IDENTIFIED CONSERVATION NEEDS ADDRESSING THREATS DUE TO HABITAT CONVERSION/LOSS

Cause/Driver	Current USAID/USG Activity	Comments
Inadequate institutional/legal framework & conflicting mandates for forestry & land use law, regulations & standards	Via USFS – intermittent workshops and trainings in forest policy, fire management and illegal logging, and forest governance	No direct long-term assistance Technical assistance (TA) focused at the national level and Krasnoyarsk Krai
Unwillingness in national, regional & municipal governments to make key decisions & move forward in a transparent manner	Via USFS – intermittent seminars on forest governance to regional government	No direct long-term assistance TA focused at the national level and Krasnoyarsk Krai
Very weak capacity to monitor forest harvesting, land use change (e.g., real estate development) and conservation actions to provide timely information for enforcement	Via USFS – intermittent training on fire prevention/suppression, anti-poaching (with Wildlife Conservation Society-WCS)	No direct long-term assistance TA focused in southwest Primorye of the Russian Far East
Insufficient economic incentives for sustainable forest management, avoided deforestation, conservation including private lands	Global Development Grant Program funding provided to Transparent World (NGO) for intensified and sustainable forest management Via USFS – intermittent training/exchanges related to ecotourism	No direct long-term assistance TA focused on Sakhalin Island, Kamchatka and Lake Baikal area
Global climate change	Global Development Grant Program funding provided to the Center for Environmental Innovation (NGO) adaptation and mitigation strategies in the forest sector of the UNESCO World Heritage and Biodiversity Centers Via USFS – sponsorship to climate change seminar	No direct long-term assistance USAID coordinates and communicates with the Bilateral Presidential Commission’s Climate Change Committee
Limited awareness of role of private sector land clearing/forest fragmentation on forest and biodiversity degradation	Global Development Grant to WCS for activities with the Amur Tiger Via USFS – intermittent workshops and exchanges on fragmentation, biodiversity threats	No direct long-term assistance TA focused primarily on Lake Baikal
Limited awareness of forests in providing ecosystems services	Via USFS – intermittent trainings, exchanges with Wild Salmon Center on ecosystem awareness	No direct long-term assistance TA focused on Lake Baikal, Sakhalin Island, Kamchatka and Krasnoyarsk Krai

ADDRESSING THREATS FROM GLOBAL CLIMATE CHANGE

Cause/Driver	Current USAID/USG Activity	Comments
Unwillingness in national, regional, & municipal governments to make key decisions and move forward in a transparent manner	Via USFS – intermittent seminars on forest governance to regional government	No direct long-term assistance TA focused on Krasnoyarsk Krai
Climate change	Global Development Grant Program funding provided to the Center for Environmental Innovation (NGO) adaptation and mitigation strategies in the forest sector of the UNESCO World Heritage and Biodiversity Centers	No direct long-term assistance USAID coordinates and communicates with the Bilateral Presidential Commission’s Climate Change Committee which is investigating black carbon
Lack of public awareness and understanding	Via USFS – intermittent exchanges/seminars on climate change	No direct long-term assistance Minimal TA

ADDRESSING THREATS FROM POLLUTION OF AQUATIC ECOSYSTEMS

Cause/Driver	Current USAID/USG Activity	Comments
Gaps in pollution laws, standards and regulations	No activity	
Lack of complete disclosure of types and extent of pollution	No activity	
Unwillingness in national, regional & municipal governments to make key decisions & move forward in a transparent manner	No activity	
Government reluctance to accept heavy costs of pollution control	Under CDSP’s Amur River Initiative, some village water supplies safeguarded.	Khabarovsk Region
Lack of public awareness on extent of pollution and effects on aquatic ecosystems	Via CDSP – intermittent training and awareness campaign assistance	No direct long-term assistance TA focus on actions in Northern Caucasus, Russian Far East and Lake Baikal

ADDRESSING THREATS FROM OVERHARVESTING CERTAIN SPECIES

Cause/Driver	Current USAID/USG Activity	Comments
Weak institutional management capacity	No activity	
Economic incentives that favor illegal harvesting of species over conservation	No activity	
Lack of alternative livelihoods for local communities	No activity	
Lack of public awareness and understanding of role of individual species in ecosystem health	Via USFS with Wildlife Conservation Society and Wild Salmon Center – intermittent training, workshops and awareness campaign assistance	No direct long-term assistance TA focus on Amur Tiger Initiative and salmon habitat protection; USAID global funds provided \$400K to WCS for assistance aimed at Amur Tiger activities

13.2 EXTENT TO WHICH ACTIONS PROPOSED MEET IDENTIFIED NEEDS

At the time of the Assessment Team's visit, a Country Strategy for USAID/Russia had not been formulated to the extent where draft documents could be shared with the team. Examining potential links between the needs identified and Strategic Objectives or with explicit Intermediate Results was not possible. However, the team did engage in several discussions with USAID staff and the US Embassy's technical specialists. USAID's Office of Regional Development Project Management Specialist also accompanied the team to several interviews in Moscow and in Khabarovskiy Krai. These discussions helped the team to better grasp the main themes (especially those related to the environment) that are likely to be components of the forthcoming strategy.

As noted in Chapter 5 of this report, the work being undertaken by the US Forest Service is important and timely. USAID has indicated that the partnership will continue for the foreseeable future, continuing in many of the same focal areas as in past years. These activities will help to address the root causes of the threats identified in this assessment.

Chapter 6 of this assessment also proposed some new programmatic activities that could more directly address causes to threats to Russia's biodiversity. Additional details about these opportunities are presented in the following chapter.

14.0 OPPORTUNITIES FOR USAID TO SUPPORT BIODIVERSITY AND FOREST CONSERVATION

Based on our discussions with USAID staff, there appear to be some programmatic areas where investments can have a positive impact on forests and biodiversity in Russia. These recommendations and opportunities are discussed below.

14.1 CROSS-CUTTING OR CROSS-SECTORAL LINKAGES

In addition to the continued partnership with the US Forest Service, there are numerous opportunities for USAID/Russia to address forest and biodiversity conservation under its new Country Strategy. Many could be effectively achieved through cross-sectoral linkages. Under the Mission's Office of Democratic Initiatives, rule of law connections exist for engaging actions that raise awareness about the amended Lacey Act and its bearing on Russia's international wood products markets. The USFS has facilitated activities in this realm recently, and there is also interest within the Environment Committee of the BPC. These represent excellent leveraging opportunities. Civil society media programs, also within the Office of Democratic Initiatives, can be explored for activities that might overlap and provide mutual benefit.

Good governance programs of the type pursued in past years, if continued under the new strategy, are important areas where biodiversity and forest sector interests often overlap, especially at the regional and municipal levels. This was seen in past funding to the CDSP. The governance area also represents an opportunity for addressing corruption related to illegal logging and also transparency of information sharing connected to timber harvesting plans governed by the region and what is actually removed by the concession holder. Similarly, working with local NGOs – as many recent USAID programs do - provides opportunities to link many governance activities (environmental awareness, improving capacities for business within the tourism sector, downstream pollution effects related to local industries, etc.) with conservation.

14.2 GAPS WHERE USAID COULD BEST LEVERAGE FUNDS AND OPPORTUNITIES FOR ACTIVITIES THAT USAID COULD ADDRESS PROGRAMMATICALLY

USAID has a wealth of experience around the globe that could be valuable in leveraging additional opportunities with Russia's partners and in directly addressing programmatic activities. The USFS partnership is well-placed and provides an historic basis for further activities that build on past actions and successes (forest fire management, ecotourism, habitat preservation, etc.). There is an excellent opportunity for USAID, working together with Russian counterparts and the BPC, to address global climate change impacts in the Russian Arctic due to black carbon.

Behavior changes, legislative and policy changes are the most needed and urgent needs to be addressed, but these require a political will from the government that partnerships cannot provide. However, there are other complementary opportunities where USAID can work in partner relationships through programs and by leveraging other resources.

PAs visited by the assessment team present a spectrum of opportunities for working in partnership with local and regional institutions that would directly address some of the root causes of the threats identified. These are areas where USAID has regional and global experience that could provide a comparative advantage for their success. These were

summarized in Chapter 6 of this report under Proposal 2 and are now presented in greater detail below. They are all inter-related and could be funded under one umbrella where rural livelihoods and PA management both benefit; or they might represent opportunities to leverage other partners in broader programs.

- **Review of the PA system design**

While the PA system is extensive, it does not provide (nor is it intended as) protection for all endangered species. The results of earlier reviews (which are in fact required under the Biodiversity Convention) on this subject need to be assessed and action taken on the creation of additional PAs and possibly changes in classification or zoning of existing areas. The traditional emphasis on forests and mountains may need to be expanded to provide greater protection for wetlands, grasslands, and marine areas. The aim would be to provide more comprehensive protection for representative habitats, ecosystems, landscapes, migration corridors especially in the face of more widespread fragmentation of these entities with Russia's current pace of commercial and economic development.

- **Hands-on, management-by-objective planning in selected protected areas**

Threats to the integrity of the protected area and its biodiversity are very real. Each of the PAs visited in the course of the assessment were in urgent need of more rigorous management-by-objective planning, and each for different reasons. Pribaikalsky National Park, under threat from a large nearby population, has land use conflict, solid waste management and carrying capacity issues for particular areas within its boundaries. The Baikalsky *zapovednik* is under significant pressure to develop its ecotourism potential, including hard infrastructure within its borders, and collecting revenues to be more self-sustaining, even though it is, at present, relatively remote. The Bolshekhkhtsirski *zapovednik* is only 25 kilometers from Khabarovsk, with a population of 600,000. The RF Prime Minister recently doubled the size of its management responsibility by adding in adjacent *zakaznik* lands. The Land of the Leopard National Park has recently been proposed at the federal level, consolidating a *zapovednik*, adjacent *zakazniks*, hunting reserves and China border lands in Primorye with hardly a blink toward local and regional authorities. Each of these areas is in dire need of strategic, participatory, more transparent and objective planning (to say nothing of the many other PAs that the Team did not have the opportunity to visit). Partnership opportunities abound here at all levels to engage inputs from a variety of participants: regional and municipal governments, private sector, civil society/NGOs. Activities are needed to ensure that livelihoods of adjacent populations are considered, that constructive dialogue and processes are maintained for conflict resolution and that PA staff are thoroughly trained and understand how objective management planning functions and adaptations are made as experience in the process is gained.

- **Developing viable management zones with PA staff, regional institutions and local municipalities**

The use of zoning as a management tool is obviously known by PA staff, but its usefulness is not fully appreciated and actual implementation is not widespread. Additional guidance and work with PA staff and other key stakeholders would be beneficial and provide "ownership" to an audience that is outside the PA boundaries. This is closely linked to the management by objective planning activities just noted. The PA manager has to be able to work with his/her management staff and with decision makers and resources users that are adjacent to the PA. Local livelihoods depend on these relationships to stabilize the local economy and to ensure the viability of the resources inside the PA boundary. Activities need to be more than manager exchanges with sister sites or visits to PAs abroad. These are of value but more direct hands-on

designing, planning, implementation and revision (from experience gained) should be the *modus operandi* here.

For example, the proposed Land of the Leopard National Park in Primorye has developed preliminary management zones (see Annex F). The next step is discussing these with the local authorities and the affected populations. Experienced PA planners and specialists in conflict resolution are required at this stage to help with the initial fine-tuning of boundaries, action-planning and implementation steps and a timetable. Similar work needs to be done with partners for other PAs visited by the assessment team.

- **Focal species can help establish public-private partnerships**

Similarly, these types of initiatives can be expanded to include other charismatic species. USAID has already provided assistance to WCS for work with the Amur tiger. Case Study 7 in Annex E lists several additional actions where USAID may wish to expand activities, or to help leverage funds that could address these. The annual Tiger Day in Vladivostok is one area where public-private partnerships help to increase awareness on this species. In the Lake Baikal region NGOs and business have rallied around the Baikal seal. On Sakalin Island or other areas bordering the Sea of Okhotsk salmon or the mighty taiman could be a key focal species. USAID could work to enhance these activities beyond the focus of an annual festival and work with businesses of all sizes. The strategy should also draw on the region's NGO experience to educate businesses as well as the local populace, and use the charismatic focal species to promote greater environmental awareness and threats to habitats. Actions that highlight the regions attributes also can add value to a business operation, and working with local tourism groups, the regional tourist office and private tourism enterprises also helps to expand awareness. For the public private partnership to work there has to be active communication, flexibility in planning, and a recognition that all parties can benefit.

Regional and municipal/local governments also have important roles to play. Their participation can, as equal partners, contribute to their own awareness of the important role of environment and biodiversity, as well as strengthen the base for economic development. Strategies and actions that are functional, transparent, accountable and participatory are the foundations of good environmental governance. And good governance promotes economic growth.

- **Improving local livelihoods through action planning linked to strategic tourism development, ecotourism infrastructure, and environmental education**

Considerable sums of money (up to \$2.0 million/year/PA) have been earmarked for use in PAs throughout Russia for the next three years. The assessment team found little evidence of any strategic planning associated with these funds. They are tied directly to developing ecotourism and environmental education at some of the PAs visited. But it was the team's impression that most of this was seed monies intended to make the PAs into money-making ventures. Baikalsky *zapovednik* has had a dynamic and forward thinking PA manager. It has a capable interpretive staff, a menu of ecotourism activities and also engages local people knowledgeable about the reserve during the peak summer months to assist with the work. This could serve as a model to other PAs. In Primorye the benefits of prior USAID assistance (FOREST) are in evidence with an active group of environmental educators who continue to produce quality materials for classrooms and who are engaged in a regular curriculum of activities. Again, this is another model that may be worth building on for future USAID assistance. The expanded budgets are encouraging, at least for the pilot PAs identified but more strategic thinking is required, and action planning needs to evolve from these opportunities. This area presents the most options for improving livelihoods, but scale is important, as are targeted activities appropriate to each individual site.

The Team suggests that a more strategic approach be developed, which balances conservation, education, tourism and other needs. It further suggests that a pilot program to assist villages in or adjacent to PAs be implemented. Using a model similar to CDSP, such a program would provide grants for essential infrastructure, such as drinking water or energy efficiency, while also providing training and other support for alternative income generation linked to eco-tourism.

- **Resolving conflicts related to land use and local tourism development**

Many of the protected areas are adjacent to or near large population centers and the demands for their use often exceed their capacity in terms of useable space and almost always in terms of staffing and budgets. Previous and current land uses, especially in the less restrictive national parks and *zakazniks*, also play critical roles related to management decisions and zoning. Conflicts related to these issues naturally arise. In fact they need to be thought of as part of the process, not as just an anomaly that gets resolved once and then is forgotten about. Protected area planners, managers and decision-makers in Russia have little exposure and only nominal experience with conflict management and resolution. Long- and short-term partnerships are required at the regional and municipal levels to develop systematic approaches and processes agreed to among PA stakeholders. These, in turn, should be integrated into the overall planning process for each PA. This opportunity is one with a long time horizon that would initially require specialists who work hand-in-hand with interested local parties and who can follow through, once the initial procedures and preliminary implementation has been established and tested. The Assessment Team saw a critical need for such activities at Baikalsky National Park in Irkutsk Oblast, at the Bolshekhekhtsirski *zapovednik*, with its recently added *zakasnik* and proximity to Khabarovsk, and it is looming large on the horizon at the proposed Land of the Leopard National Park in Primorye.

- **Improving transboundary cooperation linked to protected area management**

There are numerous protected areas within the Russian Federation that share borders with other countries⁴⁹. Marine, coastal and Arctic PAs are other areas that have important international connections. Transboundary cooperation in most of these areas is good but deserves additional support and encouragement. The ETOA Team encountered cooperation with Mongolia in southeastern Siberia and with China in the Amur River region in Khabarovsk and also in southwestern Primorye. It also learned of overtures from North Korea to participate in PA transboundary discussions in Primorye. More can and should be done. Experiences within Russia related to transboundary cooperation (or lack thereof) need to be shared more widely⁵⁰. Special legislation related to the Lake Baikal Basin mandated such cooperation with Mongolia, especially in the Selenga River watershed. It exists, but it does not appear to be very fruitful. A wider and more pro-active partnership would be beneficial to the Lake Baikal ecosystem. Similarly, cross-border discussions in southwest Primorye will take on even greater significance as the proposed Land of the Leopard National Park develops. There is significant territory in the shared border with China (and also North Korea) that will be affected as this expanded PA unit comes on line. Establishing formal procedures for transboundary monitoring with standards acceptable to all parties is important in these cases, as are mutually agreed upon enforcement standards for any infringements that may occur. Other international experiences with transboundary cooperation that pertain to PA management should not be overlooked by partnerships active in these RF sites.

⁴⁹ Including the US case of the "Beringia" system of parks straddling the Bering Strait.

⁵⁰ For example, Lake Peipsi, shared with Estonia, and cooperation with other riparians on the Baltic, Black and Caspian Seas.

- **Improving database management and linkages within the Russian protected area system**

There is a tremendous opportunity for PA managers to learn from one another and to capture lessons learned, problem solving strategies, visitor and constituent management techniques and the like by linking and systematizing data collection and exchanges. Likewise, annual reporting, anecdotal and special studies conducted in each protected area are information troves dating back decades that can provide insights into climate change, species distributions, and other monitoring checks. At present the annual reports are only collected but appear to have no specific means or objective other than to show that some type of monitoring exists. In many cases, nothing happens with the information and data is simply buried or lost. Reversing this would be a major data management challenge, but it could be done in increments or phases and at a variety of administrative levels. Also, because regions now have greater mandates to create their own regional and local PAs, wider knowledge, inventory information, and coordination needs with federal level PAs has become even more important. There is also an opportunity here for a network of locally-based operators to be responsible for the provision of data collection and connectivity nodes.

14.3 COOPERATION WITH GEF ON BIODIVERSITY CONSERVATION

As the table in Attachment 1 makes clear, the current and planned program of GEF in biodiversity conservation is substantial – in terms of expenditures, thematic scope and geographical reach. If USAID decides to strengthen its partnership with Russia in this area, it should plan for extensive cooperation with GEF in the design and implementation of such projects. At a minimum, such cooperation would avoid conflicts and overlaps. However, it would potentially result in considerable synergy, as each donor exploits its comparative advantage. The comparative advantages of USAID would include: its past history of successful projects in the forestry and related areas; its knowledge of many of the key priority regions for conservation; and, its strong links to capable NGOs, with their capability in “people to people” activities.

ATTACHMENT 1: BIODIVERSITY AND CONSERVATION ACTIONS

CURRENT BIODIVERSITY AND CONSERVATION ACTIONS, BY PARTNER AND RESULTS OBTAINED

Partner entity	Program/ Theme/ Project	Timing	Geographic focus	Results obtained	Other comments
USAID/ US Forest Service	Sustainable forest management Habitat conservation PA management & ecotourism	2008-2013	Country-wide Southwest Primorye, Khabarovskiy Krai, Sakhalin Island, Kamchatka, Lake Baikal watershed	Fire management, illegal logging, climate change, forest inventory, forest governance Fire prevention/suppression, anti-poaching, tiger & leopard monitoring, salmon conservation, watershed management councils Protected Area (PA) management: technology transfer, visitor surveys, participatory planning, environmental education, ecotourism	Also coordinated with the BPC's Environment Committee Training and workshops across all themes
US National Park Service (NPS)	Sister parks	Annual	Country-wide	PA staff training; lessons learned exchanges; academic research	Joins forces with USFWS
US Fish & Wildlife Service (USFWS)	Sister PA & targeted species group collaboration	Annual and periodic	Russia Far East, Arctic, Lake Baikal	PA staff training, conservation education related to tigers; fisheries habitat assessments, Arctic bird migration, marine mammal meetings & research; anti-poaching of polar bears, wildlife (snow geese) diseases research	Works with NPS on training activities; Worked with USFS on fire management & policy and law enforcement issues
National Oceanographic & Atmospheric Agency (NOAA)	Climate change, research and data exchange	Annual and periodic	Country-wide with emphasis on the Arctic	Data exchange related to species behavior & migration	Collaborates with US agencies, Roshydromet
US Department of Justice (DOJ)	Illegal logging	Annual	Country-wide	Outreach and education related to the amended Lacey Act	Works closely with USFS and also BPC
UNDP/GEF 4/ EBRD/IFC	Energy efficiency	2008-2013	Country-wide	Energy Efficiency Umbrella Program	http://www.thegef.org

UNDP/ GEF	Kamchatka Biodiversity Conservation Program	2002-2013	Kamchatka	Strengthened protected areas system Small- and Medium-sized Enterprises Support: grants and microcredit, entrepreneurs training Tourism development Salmon conservation – protection and sustainable fishery Indigenous communities; Ecological education and awareness Replication	www.unkam.ru
UNDP/ GEF	Biodiversity Conservation in the Russian portion of the Altai-Sayan Eco-region	2006-2011	Republics of Altai, Tuva, Khakassia, <i>Altaiisky krai</i> , <i>Krasnoyarskiy krai</i> , <i>Kemerovskaya oblast</i>	Transboundary cooperation in biodiversity conservation between Russia, Mongolia, Kazakhstan and China Conservation framework for rare and endangered species; Alternative sources of livelihood for local communities	http://altai-sayan.org
UNDP/ GEF	Conservation of Wetlands Biodiversity in the Lower Volga Region	2006-2011	Astrakhan <i>oblast</i> , Volgograd <i>oblast</i> , Republic of Kalmykia	Strengthened legal and regulatory instruments for conservation Improved PA management effectiveness, inventories and modern systems for monitoring and managing information on biodiversity in the region Public participation in PA activities Sustainable water management regimes	www.volgawetlands.ru
UNDP/ GEF	Strengthening Protected Area System of the Komi Republic to Conserve Virgin Forest Biodiversity in the Pechora River Headwaters Region	2008 – 2013	Komi Republic	PA inventory and restructuring to capture globally valuable forest biodiversity; Enhanced financial sustainability of the PA system Innovative and adaptive practices to mitigate and prevent threats to biological diversity; New partnerships with local land users and population, use innovative conservation tools	
UNDP/ GEF	Conservation and sustainable use of biological diversity in Russia's Taymyr Peninsula: Maintaining connectivity across the landscape	2005-2010	Taymyr Peninsula	Innovative and adaptive practices to mitigate and prevent threats to biological diversity; New partnerships with local land users and population, use of innovative conservation tools	

UNDP/ GEF	Strengthening the Marine and Coastal Protected Areas of Russia	2008-2014	Commander Islands, Primorskiy <i>krai</i> , Leningrad <i>oblast</i>	Development of the legislation and institutional framework for the management of marine PAs Efficient innovative approaches to the reduction of threats to marine biodiversity, including pollution, overexploitation of marine resources, invasive species, and degradation of marine habitats	
UNDP/ GEF	Improving the coverage and management efficiency of protected areas in the steppe biome of Russia	2008-2014	Daurian steppe, Republic of Kalmykia, Orenburg and Kursk <i>oblasts</i>	Demonstration strategies to reduce risks and pressures related to the land use in and around steppe protected areas An evaluation of climate change risks for most vulnerable steppe ecosystems in Russia Transboundary cooperation in biodiversity conservation with neighboring countries	
UNDP/ GEF	Joint Actions to Reduce PTS and Nutrients Pollution and Conserve Biodiversity in Lake Baikal through Integrated Basin Management	2008-2013	Lake Baikal: Russia, Mongolia	Transboundary diagnostic analysis and a Strategic Action Programme, including an Integrated Water Resources Management Plan for the Baikal Lake Basin. The project will strengthen regional cooperation between Russia and Mongolia and build institutional capacity on the national level for the development of integrated planning and water resources management systems.	
UNEP/ GEF-5	Support to the National Programme of Action for the protection of the Arctic marine environment (NPA-Arctic)	2005-2011	Arctic Zone of the Russian Federation	Preparation of the Strategic Action Programme (SAP); Pilot and demonstration projects on indigenous environmental co-management, marine water clean-up by using brown algae, and environmental remediation in the areas of decommissioned military bases.	The program is under preparation, participation of UNDP, the World Bank is envisaged
UNDP/ GEF-5 (plan)	Avoiding emissions and improving sequestration through Sustainable Forest and Peatland Management (Umbrella programme)	2011 - 2017	Country-wide	Conservation and sustainable management of high conservation value forests Enhancing carbon sinks and emission reduction in forestry Peatlands conservation and sustainable management	In cooperation with Wetlands International

UNDP/ UNEP/ GEF-5 (plan)	Landscape level climate resilient conservation and integrated resource management (Umbrella programme)	2011 - 2017	Country-wide	Update of the National Biodiversity Strategy and Action Plan Biodiversity conservation in wildlife management Landscape level sustainable land management Conservation of water birds and wetland ecosystem services Assessment of pastureland degradation and GCC impacts	
UNEP/ GEF-5 (plan)	Climate resilient natural resources management in the Russian Arctic (Umbrella Programme)	2011 – 2017	Arctic Zone of the Russian Federation	Conservation of Biodiversity and Traditional Use of Natural Resources in the Russian Arctic in the Context of Climate Change Arctic Black Carbon Pilot Project Integrated Environmental Management in the Basins of Major Arctic Rivers in the Context of Climate Changes	Participation of US EPA, NOAA, USAID is expected by the Russian counterparts
Trans-parent World	Climate change Habitat monitoring PA boundary delineation Resource mapping	Annual	Country-wide	Monitoring land-use changes, technology transfer; biodiversity data baselines	Works with WWF-Russia, maintains a business connection with the World Resources Institute and IKEA
Green-peace	Public awareness	Annual	Country-wide	Public awareness and environmental education	
World Wildlife Fund	Sustainable forestry Climate change Sustainable fisheries Sustainable energy	Annual	Country-wide	Public awareness and environmental education Policy formulation and advice Species conservation and management planning Habitat protection	Significant player in environment and biodiversity Maintains regional offices in priority eco-regions
Wildlife Conservation Society	Tiger and leopard research, habitat awareness, education, anti-poaching	Annual	Primorsky Krai Russian Far East	Anti-poaching training and education, tiger and leopard awareness, monitoring and fire prevention/suppression Mammal behavior research related to temperature change	Works with a wide variety of partners in the RFE; key partner for Amur Tiger Initiative
Wild Salmon Center	Salmon habitat protection, public awareness	Annual	Russian Far East, Kamchatka, Sakhalin Island	Public awareness on salmon habitat protection, marine and coastal ecosystems	from USAID/ USFS.
Phoenix Fund	Ecosystem and habitat awareness, and education	Annual	Primorsky <i>krai</i>	Information public awareness campaigns with big cats of the RFE; anti-poaching and monitoring	Worksd closely with WCS and Amur Tiger Initiative

Tahoe-Baikal Institute	Environmental education	Annual	Lake Baikal watershed	Environmental education, ecotourism, eco-trail construction	Works closely with <i>zapovedniks</i> & municipalities in the region
Great Baikal Trail Association	Eco-trail construction Environmental awareness	Annual	Lake Baikal watershed	Eco-trail construction/maintenance, environmental education	Works closely with <i>zapovedniks</i> ; Goal is a trail encircling Lake Baikal
Baikal Wave	Public awareness	Annual	Irkutsk <i>oblast</i> & Lake Baikal region	Environmental education; public awareness campaigns	
Green House	Public awareness through participation	Annual	Khabarovsk	Environmental education, species conservation	
The Wildlife Center	Public awareness Species conservation Habitat conservation and protection	Annual	Russia Far East with focus on Khabarovskiy Krai, Kuril and Sakhalin Islands	Species (tiger, salmon) conservation, legislative reform, public awareness, environmental education & materials development, anti-poaching campaigns	Works constructively with Krai government
Forest Certification Center	Habitat conservation Voluntary certification of forest management & products	Annual	Khabarovskiy <i>krai</i> Sakhalin Island	Forest certification and governance, forest management planning & inventory	Collaborates with the World Bank, FLEG, APEC, SGS and Krai governments
UTE Wildlife Rehabilitation Center	Species conservation	Annual (if that)	Khabarovskiy <i>krai</i>	Species (tiger, Himalayan bear & others) rehabilitation	A one-man show with a shoestring budget and no government support

ATTACHMENT 2: US FOREIGN ASSISTANCE ACT, SEC. 119

FOREIGN ASSISTANCE ACT SECTION 119

Part I, Section 119\75\ - Endangered Species

(a) The Congress finds the survival of many animal and plant species is endangered by overhunting, by the presence of toxic chemicals in water, air and soil, and by the destruction of habitats. The Congress further finds that the extinction of animal and plant species is an irreparable loss with potentially serious environmental and economic consequences for developing and developed countries alike. Accordingly, the preservation of animal and plant species through the regulation of the hunting and trade in endangered species, through limitations on the pollution of natural ecosystems, and through the protection of wildlife habitats should be an important objective of the United States development assistance.

\75\ 22 U.S.C. 2151q. Sec. 119, pars. (a) and (b) were added by sec. 702 of the International Environment Protection Act of 1983 (title VII of the Department of State Authorization Act, Fiscal Years 1984 and 1985, Public Law 98-164; 97 Stat. 1045).

(b) \75\ In order to preserve biological diversity, the President is authorized to furnish assistance under this part, notwithstanding section 660,\76\ to assist countries in protecting and maintaining wildlife habitats and in developing sound wildlife management and plant conservation programs. Special efforts should be made to establish and maintain wildlife sanctuaries, reserves, and parks; to enact and enforce anti-poaching measures; and to identify, study, and catalog animal and plant species, especially in tropical environments.

\76\ Section 533(d)(4)(A) of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1990 (Public Law 101-167; 103 Stat. 1227), added ``notwithstanding section 660'' at this point.

(c) \77\ Funding Level.--For fiscal year 1987, not less than \$2,500,000 of the funds available to carry out this part (excluding funds made available to carry out section 104(c)(2), relating to the Child Survival Fund) shall be allocated for assistance pursuant to subsection (b) for activities which were not funded prior to fiscal year 1987. In addition, the Agency for International Development shall, to the fullest extent possible, continue and increase assistance pursuant to subsection (b) for activities for which assistance was provided in fiscal years prior to fiscal year 1987.

\77\ Pars. (c) through (h) were added by sec. 302 of Public Law 99- 529 (100 Stat. 3017).

(d) \77\ Country Analysis Requirements.--Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of-

- (1) the actions necessary in that country to conserve biological diversity, and
- (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

(e) \77\ Local Involvement.--To the fullest extent possible, projects supported under this section shall include close consultation with and involvement of local people at all stages of design and implementation.

(f) \77\ PVOs and Other Nongovernmental Organizations.-- Whenever feasible, the objectives of this section shall be accomplished through projects managed by appropriate private and voluntary organizations, or international, regional, or national nongovernmental organizations, which are active in the region or country where the project is located.

(g) \77\ Actions by AID.--The Administrator of the Agency for International Development shall-(1) cooperate with appropriate international organizations, both governmental and nongovernmental;

- (2) look to the World Conservation Strategy as an overall guide for actions to conserve biological diversity;

- (3) engage in dialogues and exchanges of information with recipient countries which stress the importance of conserving biological diversity for the long-term economic benefit of those countries and which identify and focus on policies of those countries which directly or indirectly contribute to loss of biological diversity;

- (4) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity;

- (5) whenever possible, enter into long-term agreements in which the recipient country agrees to protect ecosystems or other wildlife habitats recommended for protection by relevant governmental or nongovernmental organizations or as a result of activities undertaken pursuant to paragraph

- (6), and the United States agrees to provide, subject to obtaining the necessary appropriations, additional assistance necessary for the establishment and maintenance of such protected areas;

- (6) support, as necessary and in cooperation with the appropriate governmental and nongovernmental organizations, efforts to identify and survey ecosystems in recipient countries worthy of protection;

- (7) cooperate with and support the relevant efforts of other agencies of the United States Government, including the United States Fish and Wildlife Service, the National Park Service, the Forest Service, and the Peace Corps;

- (8) review the Agency's environmental regulations and revise them as necessary to ensure that ongoing and proposed actions by the Agency do not inadvertently endanger wildlife species or their critical habitats, harm protected areas, or have other adverse impacts on biological diversity (and shall report to the Congress within a year after the date of enactment of this paragraph on the actions taken pursuant to this paragraph);

(9) ensure that environmental profiles sponsored by the Agency include information needed for conservation of biological diversity; and

(10) deny any direct or indirect assistance under this chapter for actions which significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas.

(h) \77\ Annual Reports.--Each annual report required by section 634(a) of this Act shall include, in a separate volume, a report on the implementation of this section.

ATTACHMENT 3: RUSSIAN MEMBERSHIP IN ENVIRONMENTAL, BIODIVERSITY, AND RELATED CONVENTIONS, TREATIES, AND PROTOCOLS

MULTILATERAL TREATIES, CONVENTIONS AND AGREEMENTS OF RUSSIAN FEDERATION

- 1946 International Convention for the Regulation of Whaling, Washington
- 1959 Antarctic Treaty
- 1971 The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), Ramsar
- 1972 Convention for the Protection of World Cultural and Natural Heritage, Paris
- 1972 Convention on the Conservation of Antarctic Seals
- 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention), London
- 1973 Agreement on the Conservation of Polar Bears, Oslo
- 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Washington
- 1979 Convention for the Protection of Migratory Species (Bonn Convention), Bonn
- 1979 Convention for the Protection of Wild Flora and Fauna and Natural Habitats (Bern Convention), Berne
- 1979 UN/ECE Convention on Long-range Transboundary Air Pollution, Geneva⁵¹
- 1980 Convention on the Conservation of Antarctic Marine Living Resources
- 1985 Vienna Convention for the Protection of the Ozone Layer, Vienna
- 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal
- 1989 Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention), Basel
- 1991 Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol), Madrid
- 1991 UN/ECE Convention on Environmental Impact Assessment in a Transboundary Context, Espoo;
- 1992 Convention for the Protection of the Black Sea Against Pollution (Bucharest Convention), Bucharest

⁵¹ Russia participates in only three from eight Protocols to the Convention.

- 1992 Convention for the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention, Helsinki)
- 1992 Convention on Biological Diversity, Rio de Janeiro⁵²
- 1992 UN/ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Helsinki
- 1992 UN/ECE Convention on the Transboundary Effects of Industrial Accidents, Helsinki
- 1992 United Nations Framework Convention on Climate Change (UNFCCC), New York
- 1994 UN Convention to Combat Desertification, Paris
- 1997 Agreement on cooperation in prospecting, exploration and utilization of mineral resources
- 1997 Kyoto Protocol to the UNFCCC
- 1998 Agreement on cooperation in the forestry sector and forestry between the CIS countries (Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tadjikistan), Moscow
- 1999 Agreement on Cooperation between the CIS countries in Ecology and Environmental Protection, Moscow
- 1999 Agreement of the CIS countries on cooperation in environmental monitoring, Saratov
- 2001 Agreement of the CIS countries on border cooperation in the field of development and protection of mineral resources, Minsk
- 2001 Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention), Stockholm⁵³
- 2011 (est.) Convention on Environmental Safety (in preparation)
- 2011 (est.) Convention on the protection of mountain ecosystems of the Caucasus (in preparation)

BILATERAL TREATIES AND AGREEMENTS WITH FOREIGN COUNTRIES

Armenia - Agreement between the Ministry of Natural Resources of the Russian Federation and the Ministry of Nature Protection Republic of Armenia on cooperation in the use of mineral resources and water resources from 04.12.2002.

Belarus - Agreement between the Government of the Russian Federation and the Republic of Belarus on cooperation in environmental protection from 7.5.1994, the Agreement between the Government of the Russian Federation and the Republic of Belarus on the protection and rational use of transboundary water bodies from the city of 10/25/2002; Agreement on Cooperation between the Ministry of Natural Resources of the Russian Federation and the Ministry of Natural Resources and Environment of the Republic of Belarus of 14.03.2000.

⁵² Russia is not a Party to The Cartagena Protocol on Biosafety to the Convention on Biological Diversity

⁵³ Russia has not ratified the Stockholm Convention yet

Belgium - Agreement between the Government of the Union of Soviet Socialist Republics and the Government of the Kingdom of Belgium on cooperation in environmental protection (framework agreement) on 25.06.1975.

Bulgaria - Agreement between the Government of the Russian Federation and the Government of the Republic of Bulgaria on cooperation in environmental protection, the 28/08/1998.

Bolivia - A memorandum of intent on cooperation in environmental protection between the Russian Federation and the Republic of Bolivia, the 26/07/1996.

Brazil - A memorandum of intent on cooperation in environmental protection between the Russian Federation and the Federal Republic of Brazil on 14.11.1994.

United Kingdom - Agreement between the Government of the Union of Soviet Socialist Republics and the United Kingdom of Great Britain and Northern Ireland on cooperation in environmental protection (framework agreement) on 13.10.1974.

Hungary - Agreement between the Government of the Russian Federation and the Government of the Republic of Hungary on Cooperation in Environmental Protection of 20.12.2002.

Germany - Agreement between the Government of the Russian Federation and the Federal Republic of Germany on cooperation in environmental protection (framework agreement) on 28.05.1992, a Memorandum of Understanding on Cooperation between the Russian Federation Committee on Geology and mineral resources and the Federal Institute for Geosciences and Natural resources of Germany, on 01.05.1995.

Denmark - Agreement between the Government of the Russian Federation and the Government of the Kingdom of Denmark on cooperation in environmental protection (framework agreement) on 05.01.1993.

India - Agreement between the Government of the Russian Federation and the Republic of India on cooperation in environmental protection and natural resources (Framework Agreement) from 30/06/1994.

Iran - The protocol of intent on cooperation in forestry between the Federal Forestry Service of Russia and the Ministry of the Creative Jihad Islamic Republic of Iran, on 10/16/1996.

Spain - Agreement between the Government of the Russian Federation and the Government of the Kingdom of Spain on cooperation in environmental protection (framework agreement) on 11.04.1994.

Canada - Agreement between the Government of the Russian Federation and the Government of Canada on Cooperation in Environmental Matters (the Framework Agreement) from 08/05/1993, the, Memorandum of Understanding between the Ministry of Natural Resources and the Ministry of Natural Resources Canada on cooperation in geology from 29.06.2000.

China - Agreement between the Government of the Russian Federation and the Peoples Republic of China on cooperation in environmental protection (framework agreement) on 27.05.1994, the Agreement between the Government of the Russian Federation and the Government of the PRC on joint protection of forests from fires on 26.06.1995, the Agreement between the Government of the Russian Federation and the Government of China on cooperation in the joint development of forest resources from 03.11.2000, the Agreement between the Government of the Russian Federation and the Government of China on cooperation in the exploration and use of the oceans from 27.05.2003, the Agreement between the Ministry of Natural Resources of the Russian Federation and the Ministry of Land and

Natural Resources of China on Cooperation in the field of geology and mineral resources of 02.11.2000.

Japan - Agreement on cooperation in environmental protection between the Government of the Union of Soviet Socialist Republics and the Government of Japan (Framework Agreement) from 04/18/1991, the, the Convention between the Government of the Union of Soviet Socialist Republics and the Government of Japan for the protection of migratory birds and birds of endangered species and their habitats from 20.12.1988.

Kazakhstan - Agreement between the Government of the Russian Federation and the Government of the Republic of Kazakhstan on cooperation in the field of environmental protection 22.12.2004 Agreement between the Government of the Russian Federation and the Republic of Kazakhstan on joint use and protection of transboundary water bodies from 27.08.1992, the Korea - Agreement on the Conservation of migratory birds from 2.9.1997.

Korea - Agreement between the Government of the Russian Federation and the Republic of Korea on cooperation in environmental protection (framework agreement) on 02.06.1994, the Agreement between the Government of the Russian Federation and the Republic of Korea on the protection of migratory birds from 6.1.1994.

Lithuania - Agreement between the Government of the Russian Federation and the Government of the Republic of Lithuania on cooperation in environmental protection, the 06/29/1999.

Macedonia - Agreement between the Government of the Russian Federation and the Republic of Macedonia on cooperation in environmental protection, the 01/27/1998.

Mongolia - Agreement between the Government of the Russian Federation and the Government of Mongolia on cooperation in environmental protection from 15.02.1994, the Agreement between the Government of the Russian Federation and the Government of Mongolia on the Protection and Use of Transboundary Waters on 2/11/1995, the Agreement between the Government of the Russian Federation and the Government of Mongolia for cooperation in exploration and development of mineral resources from 02.11.1996.

Netherlands - Memorandum of Understanding on cooperation in environmental protection between the Ministry of Natural Resources and Environment of the Union of Soviet Socialist Republics and the Ministry of Housing, Spatial Planning and the Environment of the Netherlands Ministry of Agriculture, Nature Management and Fisheries of the Netherlands Ministry of Transport, Public Works and Water Resources, the Netherlands, on 03/26/1991.

Norway - the Agreement between the Government of the Russian Federation and the Government of the Kingdom of Norway on cooperation in environmental protection (framework agreement) on 03.09.1992.

Poland - Agreement between the Government of the Russian Federation and the Government of Poland on cooperation in environmental protection, the 25/08/1993

Serbia and Montenegro - Agreement between the Government of the Russian Federation and the former Union Government of the Federal Republic of Yugoslavia on cooperation in environmental protection, the 07/03/1996.

Slovakia - Agreement between the Government of the Russian Federation and the Government of the Slovak Republic on cooperation in environmental protection, the 31/10/1995.

Syria - Memorandum on cooperation in environmental protection between the Ministry of Environment and Natural Resources of the Russian Federation and the Ministry of Ecology Syrian Arab Republic on 5.3.1994.

USA - Agreement between the Government of the Russian Federation and the United States of America on cooperation in environmental protection and natural resources (framework agreement) on 23.06.1994, the Memorandum of Understanding on Cooperation between the Roskomnedra, Academy of Sciences and the U.S. Geological Survey on 23.06.1994.

Finland - The agreement between the Government of the Russian Federation and the Government of the Republic of Finland on Cooperation in Environmental Protection (Framework Agreement) from 29/04/1992, the Agreement between the Government of the USSR and the Government of the Republic of Finland on the border water systems from 24.04.1964., the Framework Agreement coordination of the Russian - Finnish development programs for sustainable forest management and biodiversity conservation in the Northwest of Russia from 06.03.2001.

France - Agreement between the Government of the Russian Federation and the Government of the French Republic on cooperation in the field of protection (France), environmental protection, the 02/15/1996.

Switzerland - Agreement between the Government of the Russian Federation and the Swiss Federal Council on Cooperation in Environmental Protection (Framework Agreement) from 11/24/1989.

Sweden - Agreement between the Government of the Russian Federation and the Government of the Kingdom of Sweden on cooperation in environmental protection (framework agreement) on 03.02.1993.

Estonia - Agreement between the Government of the Russian Federation and the Government of the Republic of Estonia on cooperation in environmental protection from 11.01.1996, the Agreement between the Government of the Russian Federation and the Government of the Republic of Estonia on cooperation in the protection and rational use of transboundary waters on 20.08.1997.

South Africa - Agreement between the Government of the Russian Federation and the Republic of South Africa on cooperation in the exploration, extraction, processing and mineral processing of 28.04.1999.

Ukraine - Agreement between the Government of the Russian Federation and the Government of Ukraine on cooperation in environmental protection from 26.07.1995, the Agreement between the Government of the Russian Federation and the Government of Ukraine to implement the Agreement on the joint use and protection of transboundary water bodies from 19.10.1992, the Agreement between the Ministry of Natural Resources of the Russian Federation and the Ministry of Environment and Natural Resources of Ukraine on cooperation in the field of study, reproduction and use of mineral resources from the city 10/10/2002.

ATTACHMENT 4: RED LIST OF THREATENED AND ENDANGERED SPECIES

Sinanodonta primorjensis
 Arsenievinaia sihotealinica
 Arsenievinaia zimini
 Arsenievinaia coptzevi
 Arsenievinaia zarzaensis
 Arsenievinaia alimovi
 Corbicula producta
 Solen corneus
 Solen krusensterni

Annelida

Aphrodita australis
 Chaetopterus variopedatus
 Drawida ghilarovi
 Aporrectodea dubiosa
 Aporrectodea handlirschi
 Eisenia japonica
 Eisenia gordejefi
 Eisenia intermedia
 Eisenia malevici
 Eisenia transcaucasica
 Eisenia salairica
 Eisenia altaica
 Pheretima hilgendorfi

Crustacea

Oratosquilla oratoria
 Echinocerus derjugini
 Charybdis japonica

Insecta

Odonata

Anax imperator

Orthoptera

Bradyporus multituberculatus
 Saga pedo

Coleoptera

Carabus caucasicus
 Carabus gebleri
 Carabus avinovi
 Carabus lopatini
 Carabus constricticollis
 Carabus rugipennis
 Carabus jankowskii
 Carabus constantinovi

Carabus riedeli
 Carabus hungaricus
 Carabus menetriesi
 Carabus miroshnikovii
 Calosoma maximowiczii
 Calosoma sycophanta
 Calosoma reticulatus
 Calais parreysii
 Ceruchus lignarius
 Lucanus cervus
 Osmoderma eremita
 Osmoderma barnabita
 Osmoderma opicum
 Prottaetia aeruginosa
 Prottaetia speciosa
 Aphodius bimaculatus
 Callipogon relictus
 Rhaesus serricollis
 Xylosteus caucasicola
 Cerambyx nodulosus
 Rosalia alpina
 Rosalia coelestis
 Chrysolina urjancaica
 Brachycerus sinuatus
 Otiorhynchus rugosus
 Omias verruca
 Euidosomus acuminatus
 Stephanocleonus tetragrammus

Hymenoptera

Pleroneura dahli
 Megaxyela gigantea
 Orussus abietinus
 Characopygus modestus
 Acantholyda flaviceps
 Caenolyda reticulata
 Pseudoclavellaria semenovi
 Orientabia egregia
 Zараea gussakovskii
 Abia semenoviana
 Apterogyna volgensis
 Parnopes grandior
 Xylocopa valga
 Bombus paradoxum
 Bombus anachoreta
 Bombus unicus

Bombus proteus
 Bombus armeniacus
 Bombus czerskii
 Bombus fragrans
 Bombus mastrucatus
 Apis cerana
 Liometopum orientale

Lepidoptera

Camptoloma interiorata
 Pallarctia mongolica
 Catocala kotshubeji
 Catocala moltrechti
 Catocala nagioides
 Arcte coerula
 Mimeusemia persimilis
 Asteropetes noctuina
 Bombyx mandarina
 Numenes disparilis
 Parocneria furva
 Rosama ornata
 Sphecodina caudata
 Clanis undulosa
 Bibasis aquilina
 Coreana raphaelis
 Chaetoprocta superans
 Chaetoprocta pacifica
 Neolycaena davidi
 Neolycaena rhyminus
 Neolycaena filipjevi
 Neolycaena oreas
 Neolycaena argali
 Hamearis lucina
 Argynnis zenobia
 Seokia eximia
 Erebia kindermanni
 Oeneis elwesi
 Parnassius mnemosyne
 Parnassius felderi
 Parnassius apollo
 Sericinus montela
 Atrophaneura alcinous

Vertebrata**Cyclostomata**

Petromyzon marinus
 Petromyzon wagneri
 Petromyzon mariae

Pisces

Huso dauricus
 Huso huso
 Acipenser sturio
 Acipenser medirostris
 Acipenser schrenckii
 Acipenser baerii
 Acipenser nudiventris
 Acipenser ruthenus
 Alosa kessleri volgensis
 Alosa fallax
 Clupeonella abrau
 Salmo salar
 Salmo trutta
 Кумжа (Salmo trutta)
 Parasalmo mykiss
 Salvelinus alpinus
 Salvelinus elgyticus
 Salvelinus svetovidovi
 Hucho taimen
 Hucho perryi
 Brachymystax lenok
 Stenodus leucichthys
 Coregonus lavaretus
 Coregonus albula
 Prosopium coulteri
 Thymallus thymallus
 Rutilus frisii
 Barbus barbus
 Chalcalburnus chalcoides
 Alburnoides bipunctatus
 Elopichthys bambusa
 Mylopharyngodon piceus
 Megalobrama terminalis
 Plagiognathops microlepis
 Sabanejewia caucasica
 Silurus soldatovi
 Stizostedion volgensis
 Siniperca chuatsi
 Cottus gobio
 Gadus morhua

Amphibia

Triturus vittatus
 Triturus karelinii
 Triturus vulgaris
 Triturus fischeri
 Pelodytes caucasicus
 Bufo verrucosissimus

Bufo calamita
Pelobates syriacus

Reptilia

Trionyx sinensis
Testudo graeca
Alsophylax pipiens
Cyrtopodion russowi
Eremias argus barbouri
Eremias przewalskii
Lacerta media
Eumeces latiscutatus
Eryx jaculus
Elaphe japonica
Elaphe longissima
Elaphe hohenackeri
Elaphe taeniura
Elaphe spinalis
Dinodon rufozonatum
Dinodon orientale
Telescopus fallax
Vipera dinniki
Vipera kaznakovi
Vipera nikolskii
Vipera lebetina

Aves

Gavia arctica
Gavia adamsii
Phoebastria albatrus
Procellaria leucomelas
Oceanodroma monorhis
Pelecanus onocrotalus
Pelecanus Pelecanus
Phalacrocorax aristotelis
Phalacrocorax pygmaeus
Bubulcus ibis
Bubulcus intermedia
Bubulcus eulophotes
Platalea leucorodia
Plegadis falcinellus
Nipponia nippon
Ciconia boyciana
Ciconia nigra
Phoenicopterus roseus
Branta canadensis leucopareia
Branta bernicla hrota
Branta nigricans
Branta ruficollis

Anser erythropus
Philacte canagica
Anser indicus
Anser cygnoides
Cygnus bewickii
Cygnus columbianus
Tadorna cristata
Anas formosa
Anas angustirostris
Aix galericulata
Aythya baeri
Aythya nyroca
Oxyura leucocephala
Mergus squamatus
Pandion haliaetus
Milvus milvus
Circus macrourus
Accipiter brevipes
Buteo rufinus
Butastur indicus
Circaetus gallicus
Spizaetus nipalensis
Aquila rapax
Aquila clanga
Aquila pomarina
Aquila heliaca
Aquila chrysaetos
Haliaeetus leucoryphus
Haliaeetus albicilla
Haliaeetus leucocephalus
Haliaeetus pelagicus
Gypaetus barbatus
Neophron percnopterus
Aegyptius monachus
Gyps fulvus
Falco rusticolus
Falco cherrug
Falco peregrinus
Falco naumanni
Lagopus lagopus
Lyrurus mlokosiewiczii
Falcipennis falcipennis
Perdix dauurica suschkini
Grus japonensis
Grus leucogeranus
Grus vipio
Grus monacha
Anthropoides virgo
Porzana fusca

Porzana exquisita
 Gallicrex cinerea
 Porphyrio porphyrio
 Otis tarda tarda
 Otis tarda dubowskii
 Tetrax tetrax
 Chlamydotis undulata
 Burhinus oedicnemus
 Pluvialis apricaria apricaria
 Charadrius placidus
 Charadrius asiaticus
 Chettusia gregaria
 Himantopus himantopus
 Recurvirostra avosetta
 Haematopus ostralegus longipes
 Haematopus ostralegus osculans
 Tringa guttifer
 Eurynorhynchus pygmeus
 Calidris alpina schinzii
 Calidris alpina actites
 Calidris ptilocnemis
 Tryngites subruficollis
 Gallinago hardwickii
 Numenius tenuirostris
 Numenius arquata
 Numenius madagascariensis
 Limnodromus semipalmatus
 Glareola nordmanni
 Larus ichthyaetus
 Larus relictus
 Larus saundersi
 Rissa brevirostris
 Pagophila eburnea
 Hydroprogne caspia
 Sterna aleutica
 Sterna albifrons
 Brachyramphus marmoratus
 Brachyramphus brachyramphus
 Synthliboramphus wumizusume
 Bubo bubo
 Ketupa blakistoni
 Ceryle lugubris
 Halcyon pileata
 Dendrocopos medius
 Dendrocopos hyperythrus
 Melanocorypha mongolica
 Lanius excubitor
 Megalurus pryeri
 Megalurus paludicola

Terpsiphone paradisi
 Saxicola insignis
 Paradoxornis polivanovi
 Parus cyanus cyanus
 Sitta villosa
 Emberiza jankowskii

Mammalia**Insectivora**

Mesechinus dauuricus
 Desmana moschata
 Mogera wogura
 Sorex mirabilis

Chiroptera

Rhinolophus hipposideros
 Rhinolophus mehelyi
 Rhinolophus ferrumequinum
 Myotis blythi
 Myotis emarginatus
 Nyctalus lasiopterus
 Miniopterus schreibersi

Rodentia

Marmota sibirica
 Marmota camtschatica
 Castor fiber
 Spalax giganteus
 Myospalax psilurus
 Eolagurus luteus

Carnivora

Alopex lagopus
 Cuon alpinus
 Ursus maritimus
 Mustela altaica
 Mustela eversmanni amurensis
 Mustela lutreola turovi
 Vormela peregusna
 Lutra lutra
 Enhydra lutris
 Felis silvestris caucasia
 Felis chaus
 Felis manul
 Panthera tigris altaica
 Panthera pardus orientalis
 Panthera pardus saxicolor
 Uncia uncia
Pinnipedia
 Eumetopias jubatus
 Odobenus rosmarus
 Phoca vitulina

*Phoca vitulina stejnegeri**Phoca hispida**Halichoerus grypus***Cetacea***Lagenorhynchus acutus**Lagenorhynchus albirostris**Tursiops truncatus**Grampus griseus**Phocoena phocoena**Pseudorca crassidens**Monodon monoceros**Hyperoodon ampullatus**Ziphius cavirostris**Mesoplodon stejnegeri**Eschrichtius gibbosus**Balaena mysticetus**Eubalaena japonica**Megaptera novaeangliae**Balaenoptera musculus**Balaenoptera physalus**Balaenoptera borealis***Perissodactyla***Equus przewalskii**Equus hemionus***Artiodactyla***Moschus moschiferus**Cervus nippon**Rangifer tarandus**Bison bonasus**Procapra gutturosa**Nemorhaedus caudatus**Capra aegagrus**Ovis ammon**Ovis nivicola***Plantae****Lichens***Glossodium japonicum**Cladonia graciliformis**Cladonia vulcani**Coccocarpia cronia**Coccocarpia erythroxili**Leptogium burnetiae**Leptogium hildenbrandii**Hypogymnia hypotrypella**Menegazzia terebrata**Lobaria amplissima**Lobaria pulmonaria**Lobaria retigera**Sticta limbata**Asahinea cholanderi**Cetraria komarovii**Cetraria laureri**Cetrelia alaskana**Parmelia borisorum**Pyxine endochrysoides**Stereocaulon dactylophyllum**Stereocaulon exutum**Stereocaulon saviczii**Teloschistes flavicans**Omphalina hudsoniana**Umbilicaria esculenta**Bryoria fremontii**Cornicularia steppae**Letharia vulpina**Usnea florida***Fungi***Macrolepiota puellaris**Grifola frondosa**Grifola umbellata**Amanita strobiliformis**Gyroporus castaneus**Gyroporus cyanescens**Leccinum percandidum**Clathrus ruber**Clavariadelphus pistillaris**Cortinarius violaceus**Hericium coralloides**Dictiophora duplicata**Mutinus caninus**Mutinus ravenelii**Sparassis crispa**Strobilomyces strobilaceus**Porphyrellus pseudoscaber***Bryophyta***Campylium krylovii**Archidium alternifolium**Bryoxiphium savatieri**Aongstroemia julacea**Atractylocarpus alpinus**Oreas martiana**Indusiella thianschanica**Lindbergia brachyptera**Lindbergia duthiei**Mamillariella geniculata*

Cryphaea heteromalla
 Dozya japonica
 Homaliadelphus laevidentatus
 Neckera borealis
 Plagiothecium obtusissimum
 Taxiphyllum alternans
 Actinothuidium hookeri
 Leptopterigynandrum austro-
 alpinum
 Hyophila involuta
 Fossombronia alaskana
 Nardia japonica
 Isopaches decolorans

Lycopodia
 Isoetes asiatica
 Isoetes maritima
 Isoetes lacustris
 Isoetes setacea

Polypodiophyta
 Asplenium daghestanicum
 Asplenium exiguum
 Botrychium simplex
 Leptorumohra miqueliana
 Cheilanthes kuhnii
 Marsilea aegyptiaca
 Marsilea strigosa
 Mecodium wrightii
 Osmunda claytoniana
 Pyrrosia lingua

Gymnospermae
 Juniperus excelsa
 Juniperus foetidissima
 Juniperus rigida
 Juniperus sargentii
 Microbiota decussata
 Larix olgensis
 Pinus brutia
 Pinus densiflora
 Pinus sylvestris cretacea
 Taxus baccata
 Taxus cuspidata

Angiospermae

Aceraceae
 Acer japonicum
 Alismataceae

Alisma wahlenbergii
 Caldesia parnassifolia
 Alliaceae
 Allium altaicum
 Allium bellulum
 Allium grande
 Allium gunibicum
 Allium neriniflorum
 Allium paradoxum
 Allium pumilum
 Allium regelianum
 Nectaroscordum tripedale
 Amaryllidaceae
 Galanthus bortkewitschianus
 Galanthus caucasicus
 Galanthus lagodechianus
 Galanthus nivalis
 Galanthus platyphyllus
 Galanthus woronowii
 Leucojum aestivum
 Pancratium maritimum
 Sternbergia colchiciflora
 Apiaceae
 Astrantia major
 Bupleurum martjanovii
 Bupleurum rischawii
 Eriosynaphe longifolia
 Halosciastrum melanotilingia
 Magadania olaensis
 Mandenovia komarovii
 Prangos trifida
 Aquifoliaceae
 Ilex sugerokii
 Araliaceae
 Aralia continentalis
 Aralia cordata
 Aralia cordata sachalinensis
 Hedera pastuchowii
 Kalopanax septemlobus
 Oplopanax elatus
 Panax ginseng
 Aristolochiaceae
 Aristolochia manshuriensis
 Asparagaceae
 Asparagus brachyphyllus
 Ruscus colchicus
 Asphodelaceae
 Asphodeline taurica
 Asphodeline tenuior

Eremurus inderiensis	Crambe koktebelica
Eremurus spectabilis	Crambe litwinowii
Asteraceae	Crambe steveniana
Amphoricarpos elegans	Didymophysa aucheri
Anthemis troztkiana	Draba insularis
Arnica alpina	Eutrema cordifolium
Artemisia hololeuca	Lepidium meyeri
Artemisia salsoloides	Macropodium pterospermum
Artemisia senjavinensis	Matthiola fragrans
Brachanthemum baranovii	Megadenia bardunovii
Cancrinia krasnoborovii	Megadenia speluncarum
Centaurea dubjanskyi	Pseudovesicaria digitata
Centaurea pineticola	Redowskia sophiifolia
Centaurea taliewii	Smelowskia inopinata
Cladochaeta candidissima	Buxaceae
Dendranthema sinuatum	Buxus colchica
Erigeron compositus	Cabombaceae
Jurinea cretacea	Brasenia schreberi
Saussurea ceterachifolia	Campanulaceae
Saussurea dorogostaiskii	Adenophora jacutica
Saussurea jadrinzevii	Campanula ardonensis
Saussurea sovietica	Campanula autraniana
Senecio aquaticus	Campanula besenginica
Serratula tanaitica	Campanula dolomitica
Tanacetum akinfievii	Campanula komarovii
Taraxacum leueoglossum	Campanula kryophila
Tridactylina kirilowii	Campanula ossetica
Berberidaceae	Edraianthus owerinianus
Epimedium colchicum	Caprifoliaceae
Epimedium macrosepalum	Lonicera etrusca
Gymnospermium altaicum	Lonicera tolmatchevii
Betulaceae	Viburnum edule
Betula maximowicziana	Viburnum wrightii
Betula raddeana	Caryophyllaceae
Betula schmidtii	Dianthus acantholimonoides
Corylus colurna	Gastrolychnis soczaviana
Ostrya carpinifolia	Gypsophila uralensis
Boraginaceae	Minuartia helmii
Eritrichium uralense	Minuartia krascheninnikovii
Mertensia serrulate	Petrocoma hoefftiana
Myosotis czekanowski	Silene akinfievii
Onosma polyphylla	Silene cretacea
Brassicaceae	Silene hellmannii
Alyssum sergievskajae	Silene rupestris
Arabidopsis tschuktschorum	Stellaria martjanovii
Borodinia tilingii	Celastraceae
Cardamine purpurea	Euonymus nana
Cardamine sphenophylla	Ceratophyllaceae
Crambe cordifolia	Ceratophyllum tanaiticum

Chenopodiaceae	Euphorbiaceae
Beta corolliflora	Euphorbia aristata
Ceratoides lenensis	Euphorbia zhiguliensis
Chloranthaceae	Leptopus colchicus
Chloranthus serratus	Fabaceae
Cistaceae	Anthyllis kuzenevae
Helianthemum arcticum	Astragalus aksaicus
Colchicaceae	Astragalus arnacantha
Bulbocodium versicolor	Astragalus elerceanus
Colchicum autumnale	Astragalus fissuralis
Colchicum laetum	Astragalus igoschinae
Colchicum speciosum	Astragalus karakugensis
Colchicum umbrosum	Astragalus kungurensis
Cornaceae	Astragalus luxurians
Bothrocaryum controversum	Astragalus olchonensis
Cyperaceae	Astragalus tanaiticus
Carex davalliana	Astragalus zingeri
Carex erythrobasis	Calophaca wolgarica
Carex incisa	Cicer minutum
Carex insaniae	Desmodium oldhami
Carex japonica	Eremosparton aphyllum
Carex laxa	Genista albida
Carex livida	Genista humifusa
Carex malyshevii	Genista suanica
Carex umbrosa	Genista tanaitica
Cladium mariscus	Glycyrrhiza korshinskyi
Eleocharis margaritacea	Gueldenstaedtia monophylla
Eleocharis tetraquetra	Hedysarum americanum
Fimbristylis ochotensis	Hedysarum candidum
Rhynchospora faberi	Hedysarum cretaceum
Rhynchospora fusca	Hedysarum daghestanicum
Daphniphyllaceae	Hedysarum grandiflorum
Daphniphyllum humile	Hedysarum minussinense
Dioscoreaceae	Hedysarum razoumovianum
Dioscorea caucasica	Hedysarum ucrainicum
Dioscorea nipponica	Hedysarum ussuriense
Dipsacaceae	Hedysarum zundukii
Cephalaria litvinovii	Lathyrus litvinovii
Scabiosa olgae	Lathyrus venetus
Droseraceae	Lespedeza cyrtobotrya
Aldrovanda vesiculosa	Lespedeza tomentosa
Ebenaceae	Medicago cancellata
Diospyros lotus	Oxytropis Acanthacea
Ericaceae	Oxytropis alpestris
Rhododendron fauriei	Oxytropis dubia
Rhododendron schlippenbachii	Oxytropis glandulosa
Rhododendron tschonoskii	Oxytropis includens
Eriocaulaceae	Oxytropis lanuginosa
Eriocaulon komarovii	Oxytropis nitens

Oxytropis nivea	Hyssopus cretaceus
Oxytropis physocarpa	Thymus cimicinus
Oxytropis sublongipes	Thymus pulchellus
Oxytropis todomoshiriensis	Liliaceae
Oxytropis trichophysa	Bellevalia sarmatica
Oxytropis triphylla	Cardiocrinum glehnii
Oxytropis tschujae	Erythronium caucasicum
Pueraria lobata	Erythronium japonicum
Vavilovia formosa	Erythronium sibiricum
Vicia hololasia	Fritillaria caucasica
Fagaceae	Fritillaria dagana
Quercus dentata	Fritillaria ruthenica
Fumariaceae	Fritillaria ussuriensis
Adlumia asiatica	Lilium callosum
Corydalis bungeana	Lilium cernuum
Corydalis tarkiensis	Lilium kesselringianum
Gentianaceae	Lilium lancifolium
Gentiana lagodechiana	Lilium martagon
Gentiana paradoxa	Lilium pseudotigrinum
Swertia perennis	Muscari coeruleum
Globulariaceae	Muscari dolichanthum
Globularia punctata	Ornithogalum arcuatum
Globularia willkommii	Scilla scilloides
Globularia trichosantha	Tulipa lipskyi
Grossulariaceae	Tulipa schrenkii
Ribes ussuriense	Lobeliaceae
Hydrangeaceae	Lobelia dortmanna
Deutzia glabrata	Magnoliaceae
Schizophragma hydrangeoides	Magnolia obovata
Iridaceae	Menyanthaceae
Belamcanda chinensis	Nymphoides coreana
Crocus biflorus	Moraceae
Crocus speciosus	Ficus carica
Crocus vallicola	Myricaceae
Gladiolus palustris	Myrica gale
Iris acutiloba	Najadaceae
Iris ensata	Caulinia tenuissima
Iris ludwigii	Nelumbonaceae
Iris mandshurica	Nelumbo nucifera
Iris notha	Nymphaeaceae
Iris pumila	Euryale ferox
Iris scariosa	Nuphar japonica
Iris tigridia	Orchidaceae
Iris timofejewii	Anacamptis pyramidalis
Iris ventricosa	Calypso bulbosa
Juglandaceae	Cephalanthera damasonium
Juglans ailanthifolia	Cephalanthera longibracteata
Pterocarya pterocarpa	Cephalanthera longifolia
Lamiaceae	Cephalanthera rubra

Cypripedium calceolus	Glaucium flavum
Cypripedium macranthon	Papaver bracteatum
Dactylorhiza baltica	Papaver lapponicum
Dactylorhiza majalis	Papaver lisae
Dactylorhiza sambucina	Papaver orientale
Dactylorhiza traunsteineri	Papaver walpolei
Dactylorhiza triphylla	Plumbaginaceae
Eleorchis japonica	Armeria vulgaris
Epipogium aphyllum	Limoniopsis owerinii
Gastrodia elata	Poaceae
Himantoglossum caprinum	Coleanthus subtilis
Himantoglossum formosum	Deschampsia turczaninowii
Limodorum abortivum	Diandrochloa diarrhena
Liparis loeselii	Dimeria neglecta
Myrmechis japonica	Elytrigia stipifolia
Neottianthe cucullata	Festuca bargusinensis
Ophrys apifera	Hordelymus europaeus
Ophrys caucasica	Koeleria karavajevii
Ophrys insectifera	Koeleria sclerophylla
Ophrys oestrifera	Poa radula
Orchis coriophora	Psathyrostachys daghestanica
Orchis mascula	Psathyrostachys rupestris
Orchis militaris	Secale kuprijanovii
Orchis morio	Stipa consanguinea
Orchis pallens	Stipa dasyphylla
Orchis palustris	Stipa pennata
Orchis picta	Stipa pulcherrima
Orchis provincialis	Stipa syreistschikowii
Orchis punctulata	Stipa zaleskii
Orchis purpurea	Tripogon chinensis
Orchis simia	Zingeria biebersteiniana
Orchis tridentata	Berberidaceae
Orchis ustulata	Diphylleia grayi
Pogonia japonica	Polygonaceae
Serapias vomeracea	Polygonum alaskanum
Spiranthes spiralis	Polygonum amgense
Steeniella satyrioides	Rheum altaicum
Traunsteinera globosa	Primulaceae
Orobanchaceae	Androsace koso-poljanskii
Mannagettaea hummelii	Cyclamen coum
Paeoniaceae	Primula beringensis
Paeonia hybrida	Primula darialica
Paeonia kavachensis	Primula juliae
Paeonia lactiflora	Primula renifolia
Paeonia obovata	Sredinskya grandis
Paeonia oreogeton	Punicaceae
Paeonia tenuifolia	Punica granatum
Paeonia wittmanniana	Ranunculaceae
Papaveraceae	Aconitum biflorum

Aconitum decipiens	Chrysosplenium rimosum
Aconitum flerovii	Saxifraga columnaris
Aconitum paskoi	Saxifraga dinnikii
Aconitum sajanense	Saxifraga korshinskii
Aconitum tanguticum	Saxifraga lactea
Anemone baikalensis	Scrophulariaceae
Anemone blanda	Castilleja arctica
Anemone uralensis	Cymbochasma borysthenica
Beckwithia glacialis	Scrophularia cretacea
Delphinium puniceum	Trapella sinensis
Delphinium ukokense	Veronica bogosensis
Delphinium uralense	Veronica filifolia
Miyakea integrifolia	Veronica sajanensis
Pulsatilla pratensis	Solanaceae
Pulsatilla vernalis	Atropa bella-donna
Pulsatilla vulgaris	Staphyleaceae
Ranunculus sajanensis	Staphylea colchica
Rosaceae	Staphylea pinnata
Amygdalus pedunculata	Thymelaeaceae
Armeniaca mandshurica	Daphne altaica
Cotoneaster alaunicus	Daphne baksanica
Cotoneaster cinnabarinus	Daphne cneorum
Cotoneaster lucidus	Stelleropsis altaica
Exochorda serratifolia	Stelleropsis caucasica
Potentilla beringensis	Tiliaceae
Potentilla eversmanniana	Tilia maximowicziana
Potentilla volgarica	Trapaceae
Prinsepia sinensis	Trapa natans
Sanguisorba magnifica	Valerianaceae
Sorbaria rhoifolia	Valeriana ajanensis
Sorbocotoneaster pozdnjakovii	Verbenaceae
Rubiaceae	Caryopteris mongholica
Galium paradoxum	Violaceae
Salicaceae	Viola incisa
Populus balsamifera	Vitaceae
Salix darpirensis	Ampelopsis japonica
Saxifragaceae	Parthenocissus tricuspidata

ATTACHMENT 5: ECOREGIONS (TOTAL AND OF GLOBAL PRIORITY)

	Name of Ecoregion	Area (1,000 km²)
1	Ice Arctic deserts and tundra	250.7
2	Yamal and Gydan Arctic tundra	192.4
3	Tundra of Gydan Peninsula	116.9
4	Coastal Arctic tundra of Taimyr Peninsula	163.3
5	Forests, mountain tundra, and meadows of Kamchatka Peninsula	293.5
6	Forests and mountain tundra of Kuril Islands	21.1
7	Coastal tundra of Kola Peninsula	80.9
8	Tundra and forested tundra of the Polar Ural	96.3
9	East Siberian tundra	555.6
10	Tundra of northeast Asia	636
11	Arctic desert and tundra of Taimyr Peninsula and northern Siberian lowland	660.9
12	Kaninsko-Malozemelskaya and Bolshezemelskaya tundra	126.4
13	Ob-Pur and Yenisey northern taiga	303.1
14	Okhotsk northern taiga and thin forests	552.5
15	Southern taiga of the Sakhalin Island	18.8
16	Northern and middle taiga of Pechora plain	240.4
17	North Sosva northern taiga	59.4
18	Mountain tundra and northern taiga of Putoran Lena-Olenek plateaux	922.6
19	Northern taiga of Ob-Nadym plain	271.1
20	Middle taiga of the Sakhalin Island	30.7
21	Northern and middle taiga of Kola Peninsula, Karelia and White Sea coast	244.9
22	Northern taiga and mountain tundra of the Urals	74.4
23	Northern taiga and thin forests of northeastern Siberia	1235.5
24	Steppe and forested steppe of Transbaikal region (1)	15.7
25	Steppe and forested steppe of Transbaikal region (2)	79.8
26	Southern taiga of Baltic plain	93
27	Middle taiga of western Siberia	630.9
28	East European northern and middle taiga	388.7
29	Mountain taiga forests and freshwater communities of the Baikal Lake	38.1
30	Middle and southern taiga of Angara river watershed and Yenisey Ridge	426.3
31	Steppe and forested steppe of lowlands and uplands of southern Siberia	204.1
32	Forests of middle and southern Ural	214.6
33	Southern and mountain taiga of the Sayan and eastern Baikal area	236.1
34	Semi-deserts of the Russian plain	133.3
35	Southern taiga of Tobol-Ishim and Vasugan plains	643.9
36	Taiga of middle and eastern Siberia	2526.4
37	Mountain taiga of Transbaikal region	464.4
38	Mountain taiga and steppe of the Altai, Sayan, and eastern Tuva upland	392.9
39	Mixed, broad-leaved forests and forested steppe of the Russian plain	779.2
40	Middle and southern taiga of the southern Far East	722.5
41	Southern taiga and mixed coniferous-broad-leaved forests of the Russian plain	924.4
42	Steppe and forested steppe of southern Ural and western Siberia	808.3
43	Steppe of the Russian plain	603.5
44	Mountain broad-leaved forests and upland steppe of the Caucasus	201.4

MAJOR THREATS TO GLOBAL BIODIVERSITY CONSERVATION IN THE RUSSIAN FEDERATION⁵⁴

- *Altai-Sayan Montane Forests* — uncontrolled logging (transport corridor for logs to China); revived hydropower construction on Katun river; habitat fragmentation; wildfires; land-use conversion.
- *Barents-Kara Sea* — overfishing; pollution.
- *Bering Sea* — overfishing; pollution; degradation of reproduction habitat.
- *Caucasus-Anatolian-Hyrcanian Temperate Forests* — coastal resort development; land-use conversion intrusions into Sochinsky National Park.
- *Chukote Coastal Tundra* — mining; poaching (stone sheep, brown bear, Kamchatkan marmot).
- *Daurian Steppe* — conversion to agriculture; cattle grazing; water erosion.
- *Eastern Siberian Taiga* — unmanaged logging; oil and gas pipelines to China and Pacific Coast.
- *European Mediterranean Montane Mixed Forests* — coastal and resort development; fragmentation.
- *Fenno-Scandia Alpine Tundra and Taiga* — fragmentation from unmanaged logging.
- *Kamchatka Taiga and Grasslands* — wildfires; uncontrolled forest harvesting.
- *Lake Baikal* — unplanned development; planned oil and gas pipelines; pollution.
- *Lena River Delta* — pollution; poaching.
- *Northeast Atlantic Shelf Marine* — overfishing.
- *Okhotsk Sea* — development of petroleum reserves; over-harvesting of marine invertebrates.
- *Russian Far East Rivers and Wetlands* — Bureya River hydropower stations; transboundary water pollution; overfishing especially of salmon and sturgeon; human-caused wildfires; poaching; introduction of exotic fish species.
- *Russian Far East Broadleaf and Mixed Forests* — uncontrolled harvesting of wood and non-timber forest products; sedimentation of waterways; pipeline construction; exotic species; forest type conversion to birch and aspen.
- *Taimyr and Siberian Coastal Tundra* — mining.
- *Ural Mountains Taiga* — large dam construction on Belaya river; forest fragmentation; wildfires; changes in forest composition with spread of birch-dominated forests.
- *Volga River Delta* — air and water pollution; poaching of sturgeon, saiga antelope, etc

⁵⁴ Eco-regions are listed in Olsen & Dinerstein (2002), and Chemonics (2005) provides the major threats to each eco-region.

ANNEX A: BIBLIOGRAPHY

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ANNEX B: BIOGRAPHICAL SKETCHES OF THE EVALUATION TEAM

TEAM LEADER/WATER AND ENVIRONMENT SPECIALIST – PETER WHITFORD

Dr. Whitford is an environmental and natural resources management specialist with excellent leadership skills and expertise in water resources management, environmental policy and management, and institutional development. His program evaluation experience includes numerous assignments for the World Bank and three for USAID, in Egypt and twice in Bangladesh – the latest of these had an emphasis on GCC and biodiversity. In 2006-7, he was senior international consultant for a study *Integration of Environment into Agriculture and Forestry: Progress and Prospects in Eastern Europe and Central Asia*, (2 vols.), which assessed 22 countries, including Russia. Earlier, he was Manager of the World Bank's Aral Sea Basin Unit and worked with the five countries of Central Asia on the water and salt management problems of the region. He also managed the Bank's part of the Black Sea Environmental Program, with an emphasis on municipal wastewater treatment. Dr. Whitford is a well organized Team Leader with superb analytical skills and a keen insight into the environmental issues in countries in transition. He successfully completed the four-month USAID-funded Bangladesh Environment Sector Assessment and Strategic Analysis as Team Leader of the ECODIT Team.

INTERNATIONAL BIODIVERSITY SPECIALIST – STEVE DENNISON

Dr. Steven Dennison is a natural resource specialist with excellent leadership and communication skills who has extensive experience leading teams in the design, management, and evaluation of natural resources and environmental activities. Dr. Dennison's professional career spans 30 years and includes long-term and short-term assignments in Central and Eastern Europe, Asia, Africa, the US, the Caribbean, and North America. He has served as a member or team leader on six Environmental Threats and Opportunities Analyses/FAA Sections 118 and 119 Assessments. Dr. Dennison has also successfully led teams in conducting large program/project evaluations and assessments for USAID. In addition, he has worked on a variety of USAID-funded biodiversity conservation, natural resource management, and economic growth activities. He is well-organized, possesses excellent oral and written communication skills, and is an effective team leader.

LOCAL GLOBAL CLIMATE CHANGE AND ENVIRONMENT SPECIALIST– ALEXANDER AVERCHENKOV

Dr. Averchenkov is one of Russia's leading environmental experts. For three years he was a Deputy Minister in the (then) Ministry of Environment, at a time when many major initiatives were launched. He moved to head the National Pollution Abatement Facility and then became involved with issues of GCC and Russia's input to the Kyoto process and Prototype Carbon Fund. He has developed or evaluated a number of donor projects in biodiversity, debt-for-environment, renewable energy, coal bed methane, geothermal energy, the arctic marine environment, and carbon finance. He is currently an advisor to UNDP on the establishment of the International Centre on Energy Efficiency. As one of the pioneers of environmental management in Russia, Dr. Averchenko brings a uniquely broad and insightful perspective to the assignment.

LOCAL ENERGY AND ENVIRONMENT SPECIALIST – ANDREY ZAYTSEV

Dr. Zaytsev has 15 years experience in GCC, energy efficiency, alternative energy, climate change, forest legislation, environmental impact assessment, biodiversity assessment and protected areas. He was project manager on several USAID energy efficiency projects. In

addition to his proven experience in many parts of Russia, he worked in Mongolia for the European Bank for Reconstruction and Development (EBRD). He created a network of partner organizations for project implementation in the Russian Far East. He is a member of the UN Millennium Ecosystem Assessment experts' board. He brings to the assignment the skills of a scientific researcher together with much practical experience in a broad range of environmental subjects.

LOCAL FORESTRY AND BIODIVERSITY SPECIALIST – KONSTANTIN GONGALSKY

Dr. Gongalsky won an award as Best Young PhD from the Russian Academy of Sciences in 2006. In addition to his scholarly work on forest soils he has had practical experience in environmental impact assessment, forest fire management, biodiversity assessment, industrial pollution, and gas pipelines. He has worked in Sweden and Norway, as well as in several regions of Russia. He will provide major input on forest management and carbon sequestration issues, and significant support to the International Biodiversity Specialist.

ANNEX C: INDIVIDUALS AND ORGANIZATIONS WHOM THE ASSESSMENT TEAM MET

MOSCOW

Monday, November 22		
Time	Name	Title
10:00	Entire ECODIT team	
14:00	USAID/Russia Randy Flay Valeria Matveeva Olga Fedotova	COTR and Deputy Director - Office of Program and Project Development; Project Management Specialist, Office of Regional Development; Program Assistant, Off of Program & Project Development
16:30	Elena Watson	Interpreter
17:30	Russian Union of Industrialists and Entrepreneurs Yuriy Maksimenko	Deputy Chairman of the Committee on environmental, industrial and technological safety; Head of Practice, Manufacturing Assets Dept, Environment & Industrial Risks Services -- Company: "Bazovy element"
Tuesday, November 23		
11:00	Fund for Sustainable Development Oleg Fokin Elena Milanova Ruslan Butovsky	Executive Director Projects Manager Program Director
14:00	WWF Russia Victoria Elias Alexey Kokorin Elena Kulikova Alexey Knizhnikov Center for Biodiversity Conservation Mikhail Karpachevsky	Program Director Coordinator of CC and Energy program Director of Forestry Program Policy Officer, Oil & Gas program Head of Forest Conservation

Wednesday, November 24		
10:00	US Dept. of Energy Irina Aksenova Tyler Tiller Yuriy Kazakov	Senior Energy Policy Specialist Energy Attaché USAID Environmental Policy Advisor
11:30	USDA Office of Agricultural Affairs Mary Ellen Smith Marina Muran	Senior Agricultural Attaché Senior Agricultural Assistant
17:00	USAID/Russia Charles North Kathryn Stevens Inna Loukovenko Anne Marie Friar Michael Hryshchshyn Randy Flay Valeria Matveeva	Office Chiefs (briefing) USAID/Russia Mission Director Deputy Mission Director Office of Democratic Initiatives Office of Health Office of Program & Project Development, Head Office of Program & Project Development/ETOA COTR Office of Regional Development

Thursday, November 25		
Time	Name	Title
09:15	ETOA Team	Consultants-in-a-line: RFE site visit planning continued
11:00	UNDP Russia Elena Armand	Program Coordinator, Assistant Resident Representative
12:00	Energy Agency Nelly Segisova Sergey Roginko	Head, International Strategic Cooperation Development Advisor to the Director General
13:00	Ministry of Economic Development Oleg Pluzhnikov	<Informal Lunch, out-of-office meeting> Deputy Director of Department
17:15	Severtsov Institute of Ecology and Evolution of the Russ Acad Sci (RAS) Smirnov, Yu.P. Yurii Dgebuadze	Secretary, Foreign Division Corresponding member of the RAS, prof. Dr., deputy head

Friday, November 26		
09:00	Transparent World Dimitry Aksmov Ekaterina Tsybikova Julia Zenkevich	General Director Coordinator, Environmental Programs Head, Monitoring and GIS Dept.

11:00	US Embassy, Environ. Science, Tech. and Health Division Mark Gould Cristina-Astrid Hansell Lynette Foulton Natalya Dobrovolskaya	Coordinator, Presidents' Bilateral Commission Environment Officer
13:00	Ministry of Natural Resources Andrey Peshkov Ruslan Butovsky	Deputy Director, Department of International Cooperation, Ministry of Natural Resources and Environment Fund for Sustainable Development
14:00	World Bank Marina Smetanina Vassili Rodianov	Consultant, Russia Country Department Lead Consultant, Environmentally and Socially Sustainable Development Department
17:00	Greenpeace Ivan Blokov Alekssei Yaraschenko Mikhail Kreindlin Vladimir Chuprov	Program Director Head, Forest Dept. Head, Protected Areas Dept. Head, Energy Dept.

IRKUTSK

Monday, November 29		
Time	Name	Title
11:00	Tahoe-Baikal Institute Natasha Luzhkova Svetlana Kuklina	Russian Programs Director Alum of the program
12:00	Great Baikal Trail Eleonora Eremschenko	Acting Director
13:00	Baikal Environmental Wave NGO Marina Rikhvanova Galina Kulebakina Jenni Satton Igor Ogorodnikov Maxim Vorontsov	Co-chairman Co chairman Climate and Energy specialist Media Creates interactive center
14:30	Irkutsk Oblast Center for Energy and Resources Saving Pavlov Piotr Petrovich & Irkutsk Branch of Russian Energy Agency Podkorytov Alexander Innokentievich	Director Director
16:00	Irkutsk Oblast Forestry Agency Mr. Vladimir Nicolaevich Shkoda Mr. Vitaly Viktoovich Akberdin	Head of the Agency Deputy Head of the Agency

Tuesday, November 30		
Time	Name	Title

11:00	Pribaikalsky National Park Oleg Alexandrovich Apanasik Vitaliy Vladimirovich Ryabtsev	Director Deputy-Director, Science
16:30	Baikal Limnological Institute, R.A.S. Mikhail Grachev	Director

Wednesday, December 1		
Time	Name	Title
11:00	Shelekhov Kindergarten #14 (EE project) Suvorova Alyona Viktorovna Filyushina Tatiana Anatolievna Kuznetsova Lyudmila Nikolaevna Zakharova Tatiana Vladimirovna Skorokhodova Olga Leonidovna Matveeva Yulia Sergeevna	Director Deputy Director Engineer, Dept Education, Youth Policy & Sports, Shelekov Municipal District Consultant, Dept Education, Youth Policy & Sports, Shelekov Municipal District Head, Dept Education, Youth Policy & Sports, Shelekov, Municipal District Head, Dept of Economy, Shelekov Municipality
17:00	Irkutsk Oblast Ministry of Natural Resources & Environment Nina Genadievna Abarinova	Deputy Minister

Thursday, December 2		
Time	Name	Title
13:00	Baikalsk Administration and EE project Hotilovich Viktor Gennadievich	Head of Intermunicipal Resource Center, Baikalsky raion
16:00	Buriat Regional Division on Baikal Sergey Shapkhaev Vladimir Belogolovov	Director Deputy Director

Friday, December 3		
Time	Name	Title
10:00 thru 16:00	Baikalsky State Biosphere Reserve Sutula Vasily Ivanovich Boichenko Viktor Stepanovich Krasnopevtseva Viktoria Mikhailovna Sedova Galina Vladimirovna Tkach Sergey Leonidovich Peshnova Irina Anatolievna	Director Deputy Director on Scientific research Deputy Director on Ecoeducation Deputy Director on Protection Chief of foresters Deputy Director on Ecotourism

KHABAROVSK AREA

Monday, December 6		
Time	Name	Title
10:00	Green House NGO Sergey Alexandrovich Pleshakov	Director

13:00	Bolshehehzhirsky Nature Reserve Sergey Vasilievich Borisov	Director
15:00	Ecological-esthetic center LAD Ludmila Vladimirovna Pokachalova	Director

Tuesday, December 7

Time	Name	Title
11:00	Ministry for Nature Resources, Sergey Nikolaevich Andrienko Viktor Vladimirovich Barduyk	Deputy-minister Head of the Department for Environmental Protection of Khabarovskiy Krai
14:00	Ministry of Economic Development and Foreign Affairs Elizaveta Nikolaevna Telushkina Vladimir Vasilievich Eshenko	Deputy Minister Head of the Department for Municipal Economy
15:00	Department of Forest Management, Ministry for Nature Resources Yuri Vitalievich Grischuk Vladimir Vasilievich Chernysh	1 st Deputy Head of Department Deputy Head of Department on Forest Fires Fighting
17:00	Vzlet NGO Elena Parfenovna Larionova Kirill Gennadievich Gorokhov All-Russian Society for Nature Conservation, Khabarovskiy Krai Branch Vladimir Pavlovich Sidorov	Director Deputy Director on Environmental Issues Head of the Branch

Wednesday, December 8

Time	Name	Title
9:00	Khabarovsk Fund for Nature Conservation Alexander Nikolaevich Kulikov	Director
11:00	Institute for Water and Environmental Problems, RAS Nikolay Andreevich Ryabinin Tatiana Nikolaevna Tolkacheva Amur Foundation NGO Nikolay Andreevich Ryabinin	Head of the Laboratory, Secretary of Scientific dissertation council Scientific Secretary on International Cooperation Chairman
11:00 *	Center for Forest Certification Andrey Sergeevich Zakharenkov	Director
15:00	Utes Fund, Tiger Rehab Center Eduard Kruglov	Chairman of the UTES Fund

Thursday, December 9		
Time	Name	Title
9:30	Khabarovskiy Krai Government Committee on Development of Fuel-Energy Complex Valeriy Alexeevich Glazachev Alexander Chilizubov	Deputy Minister, Head of the Commission Head of the Department on Fuel-Energy Complex monitoring and Energy Efficiency
14:00	Khabarovskiy Krai Center for Energy and Resources Saving Sergey Nikolaevich Kuchin	Director
16:00	Regional Center of Emergency Situations Markevich Alexandr Gennadievich	Former Director of the center (he was fired 2 days prior to the team's meeting with him)

Friday, December 10		
Time	Name	Title
10:00	Sikachi-Alan village administration Nina Ignatievna Druzhinina	Head of Administration
11:00	Fartop Ltd. Alexander Vyacheslavovich Shevchenko	Director

VLADIVOSTOK AREA

Friday, December 10		
Time	Name	Title
12:00	Institute of Biology and Soil Science, RAS Far Eastern Branch Zhuravlev, Yuri N. Vshivkova, Tatiana S. Dyukarev, Vladimir A. Kostyrya, Alexey V. Krestov, Pavel V.	Academician, PhD, prof., head Botanical Garden and Institute, Far Eastern Branch of the RAS, PhD, prof., head
15:00	Wildlife Conservation Society, Russia Program Miquelle, Dale Hoette, Micheil Phoenix Fund Bereznyuk, Sergey L.	Director MIST Enforcement System Specialist Director

Sunday, December 12		
Time	Name	Title
11:00	WCS Leopard Field Station Alena Salmanova Dina Matukina Viktor Storozhuk Samantha Earle Dale Miquelle	Leopard & Tiger Monitoring Field Team Member Leopard & Tiger Monitoring Field Team Member Leopard & Tiger Monitoring Field Team Member Leopard & Tiger Monitoring Field Team Member WCS, Russia Program Director
14:00	Nature Reserve “Kedrovaya Pad” Sergei Khokhlov Olga Khokhlova	Director Head of Ecological Education Dept.

Monday, December 13		
Time	Name	Title
12:00	WWF Russia Amur Branch Yury Darman Evgeny Lepeshkin Anatoly Kabanets	Director Multiple-Use Forestry Projects Coordinator Forest Projects Coordinator
1600	Administration of Primorsky Krai, Department of Conservation, Monitoring and Regulation of Wildlife Tatiana Aramileva Alexei Surovyi	Head Head of Monitoring and Usage of Wildlife Section
1730	Ministry of Natural Resources and Environment of RF, Special Inspection “Tiger” Viktor Gaponov	Director

Monday, December 13 LUCHEGORSK		
Time	Name	Title
9:30	Pervotsvet NGO Margarita Fyodorovna Tsvetkova	Deputy-Chairman
11:00	Luchegorsk town hospital Olga Alexandrovna Filatova	Chief Doctor
13:00	Luchegorsk Raion Administration (participating and hosting the working meeting with a series of organization) Vladimir Vitalievich Sinitsyn Tatiana Valentinovna Biryukova	Head of Raion Administration 1 st Deputy Head of Raion Administration Deputy Head of Raion Administration

	<p>Sergey Evgenievich Kostetsky Olga Borisovna Korotkova</p> <p>Luybov Valentinovna Golokha</p> <p>Luchegorsk town administration Yuri A. Morev Evgeniy Petrovich Starchenko</p> <p>Luchegorsk Raion Parliament Victor Stepanovich Kirpichev Tatiana Vladimirovna Kravchenko</p> <p>Primary Unit of All-Russian Society for Nature Conservation Yuri Anatolievich Trush</p> <p>Municipal Committee of Luchegorsk Town Natalia Petrovna Rovenskaya Deputee of Khabarovskiy Krai Parliament Office Nikolai Antonovich Borik</p> <p>Fund for Development of Tourism in Svetlogorie settlement Alexander Arkadieovich Tyyshev</p> <p>Pervotsvet NGO Margarita Fyodorovna Zvetkova Konstantin Nikolaevich Nabiullin</p> <p>Youth Environmental Group “Vesnyanka” Alla Mikhailovna Akatkina</p>	<p>Head of the Department of Analysis and monitoring of the Raion livelihood of Raion Administration Deputy Head of the Department of economic development of Raion Administration</p> <p>Head of town Administration Deputy-Head</p> <p>Chairman Head of the Secretary</p> <p>Chairman</p> <p>Chairman</p> <p>Assistant</p> <p>Chairman</p> <p>Deputy-Chairman Grant programs coordinator, Member of the Raion Public Chamber</p> <p>Head</p>
16:00	<p>Fund for Development of Tourism in Svetlogorie settlement Alexander Arkadieovich Tyyshev</p> <p>Svetlogorie town Administration Denis Olegovich Litvinenko</p>	<p>Chairman</p> <p>Head of the Administration</p>

Tuesday, December 14		
Time	Name	Title
9:00-12:00	Team Meeting at the US Consulate	
9:30	<p>U.S. Consulate General Sylvia Reed Curran USAID, Office of Regional Development Irina Lindberg</p>	<p>Consul General</p> <p>Program representative in the Russian Far East</p>

Tuesday, December 14 Moscow (visited by team member Alexander Averchenkov)		
Time	Name	Title
15:30	Center for Environmental Policy	
	Vladimir Zakharov	Director, Center for Environmental Policy Director, Institute of Sustainable Development of the Civic Chamber RF
17:00	Coal Institute of the Siberian Branch of the Russian Academy of Science	
	Oleg Tailakov (interview by phone)	Acting Director of the Coal Institute
	Oleg Tailakov (interview by phone)	Acting Director of the Coal Institute

Wednesday, December 15		
Time	Name	Title
10:00	Scientific-Public Coordinative Center “Living Water” Tatiana Vshivkova Elena Mikhajova	President Vice-President
12:00	Pacific Institute of Geography of the RAS Boris Preobrazhensky	Head of laboratory, PhD, Prof.

Thursday, December 16		
Time	Name	Title
09:30	Institute for Marine Biology of the RAS Vladimir E. Zhukov Sergei I. Maslennikov	Scientific Secretary, PhD, Prof. Center for Aquaculture and Littoral Resources, PhD, Head
14:00	Far Eastern National University, Institute of Mathematics and Computer Science Far Eastern Center for Economic Development Alexander L. Abramov Dmitry A. Lyutaev	Deputy Director, PhD, Prof. (FENU-IMCS) and General Director, FECED Clean Water Program Coordinator, FECED

Friday, December 17		
Time	Name	Title
10:00	BROC NGO; The World Conservation Union (IUCN); “Environment and Business” Magazine Anatoly V. Lebedev	Head Consultant for ENPI-FLEG Project at the RFE Editor Honorable Environmentalist of Russia

14:00	Team Meeting at the Business Center of Hyundai Hotel
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MOSCOW

Monday, December 20		
Time	Name	Title
15:00	Federal Service for and Hydrometeorology Environmental Monitoring Viktor G. Blinov,	Director of the Department of scientific programs, international cooperation and information resources

Tuesday, December 21		
Time	Name	Title
10:30	USAID Charles North Randolph Flay Plus numerous other staff	Mission Director COTR

Wednesday, December 22		
Time	Name	Title
15:00	USAID Randolph Flay	COTR

ST. PETERSBURG (VISITED BY TEAM MEMBER ALEXANDER AVERCHENKOV)

Tuesday, December 30		
Time	Name	Title
10:30	Arctic and Antarctic Research Institute of Roshydromet	
	Alexander Danilov	Deputy Director AARI
	Vladimir Radionov,	Head of the Department of Meteorology AARI
13:00	the Voeikova Main Geophysical Observatory of Roshydromet	
	Sergey Chicherin	Deputy Director VMGO

ANNEX D: STATEMENT OF WORK

ENVIRONMENTAL THREATS AND OPPORTUNITIES ASSESSMENT (ETOA)

A. Objectives of the Assessment

The objective of this task order is two-fold:

- To conduct a **country-wide assessment of environment issues in Russia**, with particular emphasis on those related to the Mission's potential work on Climate Change:
 1. Reducing Green House Gases (GHG) emissions through increasing energy efficiency and energy savings;
 2. Assessment of adaptation measures: improved management of fresh water resources;
 3. Role of forests in Global Climate Change (GCC);

Additionally, emphasis should be on GCC program opportunities which can be expected to enhance cooperation between U.S. and Russian organizations and government institutions; and

- To update the **country biodiversity analysis** that was completed in 2004 in response to the requirements of Section 119(d) of the Foreign Assistance Act (FAA) of 1961 (as amended) and ADS 201.3.9.2 (rev 2008).

B. Background

The USAID/Russia Mission has been providing assistance to Russia since 1992. The Mission is currently operating under the 2005 Strategic Plan for Russia, as updated and amended by the annual Operating Plan. Under this strategy the Mission has three major strategic objectives:

- SO 1: Strengthened Environment for Small and Medium Enterprises (SMEs) in Areas of Strategic Interest
- SO 2: More Open, Democratic Society
- SO 3: Use of Improved Health and Child Welfare Practices Increased.

The establishment of the Bilateral Presidential Commission in July 2009 is tangible evidence of the priority that President Obama has placed on partnership with Russia. The Commission also symbolizes a new opening in U.S. – Russia relations, providing opportunities for cooperation across a wider spectrum of issues than we have seen in some time. Under the Commission, a vision for collaboration on environmental issues is already taking shape. The Protocol of Intent signed in December 2009 by USAID, the U.S. Forest Service and the Russian Federal Forest Agency provides a framework for joint activities to protect the world's largest expanse of forest. The Energy working group has also identified possible areas of cooperation in energy efficiency and renewable energy. The U.S. must employ a new strategy to cooperate with Russia on areas where we have a common interest.

A new Mission strategy is currently being developed, one which will likely continue to emphasize assistance in the areas of democracy and governance, investing in people, peace and security, and potentially add an environmental component. This assessment is being undertaken to better inform that strategy and to identify possible new interventions and ensure that environmental issues and priorities are incorporated where needed and practical. The Biodiversity section of the report is intended to meet the requirements of FAA 119. Upon completion of the assessment, the Mission will submit the report to the

Bureau's Environmental Officer for final approval. The Contractor should build on work done to date, including but not limited to, USAID/Russia's 2004 Biodiversity Assessment and the European Commission's recently completed report, "Environment and Biodiversity: Local Action Plans for Russia's Municipalities", and USAID Policies Governing Environmental Procedures.

The U. S. Foreign Assistance Act of 1961 Section 119 requires USAID to assess national needs for biodiversity and potential USAID contributions to these needs in all country strategy documents. Specifically, FAA Section 119(d), Country Analysis Requirements requires that:

"Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of:

- (1) the actions necessary in that country to conserve biological diversity, and
- (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified. (FAA, Section 119(d)."

This requirement is also articulated in USAID's Automated Directives System (ADS), Section 201.3.8.2 on, mandatory environmental analysis for strategic plans. The ADS regulations also indicate that while not required, an Operating Unit "can save time and be more efficient by including all aspects of environment when undertaking the mandatory biodiversity and tropical forestry work." For example, these environmental aspects may include topics such as water resources, urban environmental issues and private sector concerns.

C. Tasks

I) TASK NUMBER I: ENVIRONMENTAL ASSESSMENT AND PROGRAM OPTIONS

The Contractor shall make use of the Report Outline delineated in this Statement of Work as a basis for the development of the report. In conducting the assessment the Contractor shall use the following three-pronged approach that emphasizes the description of underlying root cause issues and understanding the enabling conditions rather than extensive descriptions of specific environmental problems:

- a) Identify the underlying causes of environmental degradation and suggest strategic options to address them.
- b) Identify and describe approaches and interventions by all levels of institutions (e.g., Government of Russia, donors, NGOs, private sector) and results obtained.
- c) Analyze opportunities and constraints associated with all environmental elements.

The Contractor shall provide information on each of the environmental elements listed in the Report Outline using this approach as a means to focus their collection of data. As an attachment to the written report, the Contractor shall develop an information matrix for each primary environmental element identified (e.g., urban and rural environmental degradation, forests and biodiversity, watershed management, water resources management, energy sector issues including green and brown environmental issues). For example, under forest management the matrix will contain information on forestry sector constraints, underlying causes of constraints, the identification of field interventions, if any, by USAID and other institutions (past and present as appropriate), the enabling conditions necessary to achieve success, lessons learned from any successes or failures, and suggestions for accelerating success.

The Contractor shall identify opportunities to integrate and address environmental concerns within and related to the Mission's current and planned programs, especially as they relate to

the Mission's current work in energy efficiency (Community Support Development Program), water (Small Infrastructure for Water and Sanitation, Amur Initiative), and cooperation with the U.S. Forest Service. The Contractor shall also examine other current and planned activities under USAID/Russia programs. The Contractor shall identify opportunities for the Mission to address environmental issues in the course of developing new activities and strategies. Finally, the Contractor shall provide recommendations about how the Mission can best integrate special targets of opportunity into the Mission's new strategy in the areas described below.

The Contractor shall investigate the following areas of potential interest for U.S. - Russian environmental cooperation:

a) Reducing Green House Gases (GHG) emissions through increasing energy efficiency and energy savings:

- Potential to alternate utility and industrial facilities from the use of coal and black oil to natural gas and biofuels;
- Potential to implement pilot projects demonstrating use and sharing experience and knowledge on simple but technologically advanced approaches to energy conservation at the regional level and applying simple best practices for replication by householders in communities;
- Potential to develop economic and other incentives to encourage all sectors of the society to conserve energy;
- Identification of Russian partner capable to elaborate a set of indicators of energy efficiency understandable for prepared citizens and decision-makers;
- Potential to introduce measures aimed to prevent natural gas loss and leakage during production, transportation and distribution;
- Potential to implement pilot projects demonstrating utilization and coalmine and landfill methane;
- Potential for introduction and testing of financial and legal mechanisms of international cooperation in greenhouse gas emissions quota trading;
- Potential to establish civic forum on energy efficiency and energy saving issues which would unite representatives of parliaments, governmental agencies, businesses and NGOs from both countries.

b) Assessment of adaptation measures:

- Potential for the development of techniques to lower water consumption in industry;
- Potential to modernize public water treatment systems on water inlets and water outlets including possibility to establish new water supply wells and overhaul of abandoned or little used water wells;
- Potential to build the low-cost public monitoring system of water quality;
- Potential and barriers to develop the Amur River monitoring system;
- Potential and obstacles to utilize the US experience in projects aimed to clean or reduce pollution in Zolotoy Rog Bay near Vladivostok and mitigate negative impact of Baikalsk cellulose plant on Lake Baikal;

- Adaptation of indigenous populations in Russia permafrost regions;
- Identification of the most dangerous pollution sources in the sense of biodiversity conservation, fish resource protection and elaborate measures to mitigate negative impacts; and

c) Role of forests in Global Climate Change:

- Potential to complete pilot forest management projects that combine various methods of logging with principles of sustainable forest management to increase carbon sequestration;
- Potential to implement forest fire reduction projects that utilize both fire suppression and fuels reduction in order to produce measurable reductions in greenhouse gases from wildfire;
- Potential to implement projects aimed at reforestation following major disturbance events – including logging, insect infestations, and forests fire – with tree species and stand composition appropriately adapted for anticipated climate change and carbon storage;
- Potential to conduct long-term analysis of forest structure and dynamics, forest use, fire prevention, fire suppression, pest and disease management, and reproduction to determine the main factors negatively influencing forest condition;
- Potential to introduce legal enforcement mechanisms to prevent illegal logging and timber trafficking using advantages of the new U.S. legislation (Lacey Act)¹ and ensuring involvement of public into control of forest management

1 <http://www.fws.gov/le/pdffiles/lacey.pdf>

- Appropriateness and potential to participate in international REDD-plus carbon markets, and actions needed to enhance capacity to do so.

Regional aspect:

Special consideration should be given to the Russian Far East (RFE), Baikal region and Siberia where significant opportunities to cooperate, exchange knowledge, and improve forest and natural resource management practices exist.

2) Task Number 2: Biodiversity Report (FAA Section 119)

There are special legal requirements under the Foreign Assistance Act (Section 119) to obtain specific information on biodiversity as part of the development of a strategic plan. Task 2 is included for this reason. Specifically the following FAA Section 119 (d) country analysis requirements must be met: Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of the actions necessary in that country to conserve biological diversity, and the extent to which the actions proposed for support by the Agency meet the needs thus identified.

Information gathered for the development of Part I (State of the Environment) should be used to feed into the Part 2 Biodiversity Report.

This part of the assessment must include:

- A concise evaluation of the country-wide status of biodiversity (including ecosystem diversity, species diversity, threatened and endangered species, genetic diversity, forest biodiversity, agricultural biodiversity, ecological processes and ecosystem services, and

values and economic of biodiversity and forests), focusing on management issues, current and changing threats and required actions for conservation; and

- Identification of the extent to which these required actions for conservation can be satisfied by current or proposed Mission programs.

This section of the report should update the Mission's 2004 Biodiversity Report and include:

- Identification/Overview of Biodiversity Status and Threats, including:
 - An overview of changes to the status of biodiversity in Russia since 2004
 - An overview of changes in the social, economic, and political context for sustainable resources management and the conservation of biodiversity, including the institutions, policies, and laws affecting conservation and endangered species; the national protected area system including all IUCN2 categories of protected areas; and participation in international treaties
- Actions needed to conserve biodiversity, including:
 - The scope and effectiveness of conservation efforts, including relevant activities by donor organizations, NGOs, universities, and/or other local
 - Highlights of key institutional and policy constraints
 - Identification of priority actions to meet outstanding conservation needs
- USAID's program strategy as it relates to Biodiversity, particularly:
 - The extent to which it is contributing to conservation needs
 - Any potential opportunities for USAID to support biodiversity consistent with Mission program goals and objectives
 - If relevant, any perceived potential areas of concern related to biodiversity impact with current or planned program activities.

ANNEX E: CASE STUDIES

The ECODIT ETOA Team came across a number of areas that were important to an understanding of current issues of environmental management in Russia and which deserved more extended treatment than was possible within the space limitations of the main text. They were therefore developed as Case Studies, with the most salient points referred to in the main text.

Two of the cases – Coal bed Methane and Gas Pipeline Leakage – were mentioned in the ETOA Statement of Work but did not appear to be priority subjects for the USAID Mission Strategy. They were therefore written up as case studies without specific field work.

Two others – Black Carbon and Melting of the Permafrost – are intended to provide more context for two important topics related to GCC, one of which is already the subject of USG support. These were also desk reviews.

The remaining three – Threats from Invasive Species, Environmental Management in the Lake Baikal Region, and Conserving the Amur Tiger – provide additional background for Part 2 of the Report, on Biodiversity Conservation. These studies were the result of the Team's field visits.

LIST OF CASE STUDIES

1. Black Carbon
2. Melting of the Permafrost
3. Coal Mine Methane and Coal Bed Methane Utilization
4. Reduction of Gas Flaring and Leakage
5. Threats from Invasive Species
6. Environmental Management in the Lake Baikal Region
7. Conserving the Amur Tiger

CASE 1: BLACK CARBON IN RUSSIA

NATURE OF THE ISSUE

Black carbon is formed through the incomplete combustion of fossil fuels, biofuel, and biomass, and is emitted in both anthropogenic and naturally occurring soot. It consists of pure carbon in several linked forms. Black carbon warms the Earth by absorbing heat from the atmosphere and by reducing albedo, the ability to reflect sunlight, when deposited on snow and ice. It has a 2,000 to 4,000 times higher warming effect than the equivalent amount of CO₂. Black carbon stays in the atmosphere for only several days to weeks, whereas CO₂ has an atmospheric lifetime of more than 100 years. It has up to 55 percent of the global warming effect in comparison with CO₂ emissions of the same volume, by reducing the albedo of surfaces it covers and the atmosphere (1).

STATE OF KNOWLEDGE

This agent of global warming is especially significant in Asian countries which have a tradition of burning agricultural lands and, at the same time, produce most of their energy from fossil fuel using outdated technologies of combustion. This region is also subject to fires on both forest and agricultural lands (1). The most important black carbon source in the world is Russia, responsible for about 80 percent world black carbon emissions, and suffering from regular

forest, grassland and peat fires, producing over 70 percent of its energy by burning low-quality coal or diesel, and flaring of associated gas in the oil industry (2). Atmospheric circulation in Central and Eastern Russia result in a massive transfer of black carbon particles into the High Arctic. This may result in significant changes of temperature regime in this area, with consequent global impacts (3, 4). Most of the High Arctic heating and power stations located outside the national energy grid use diesel and coal and act as an important source of local black carbon emissions. Recent satellite surveys reveal a reduction of the ice cover in the region by 15-20 percent. The process of black carbon transfer is rather seasonal. Most of it gets to the High Arctic in the warmest period – late spring and summer - when the rate of ice melting is naturally the highest (5). Quantification of the contribution of black carbon emissions to ice melting is complicated by a lack of information.

Pam Pear of the *International Cryosphere Climate Initiative* and Elena Kobets from the *Bellona Foundation*, at a side event during the Cancun Climate conference in December 2010 noted that rapid reduction in CO₂ emissions is vital to slowing arctic warming, but that simply reducing CO₂ is not enough. It is prudent also to pay attention to the role of land use. In this case, black carbon plays a warming role as well since, when the black carbon lies over white snow, the carbon absorbs more heat and thereby exacerbates the melting (5). Other more long-term consequences of this include potential melting of permafrost, which will have dramatic impact on many Russian cities and towns in the North (see Case Study B in this report). In total, the contribution of Black Carbon to the warming in the Arctic is estimated at 30 percent of the total (6).

Severe forest fires in Russia in summer 2010 triggered a wave of interest in this problem resulting in several exploration and mitigation initiatives described in the next section.

EFFORTS TO DATE TO ADDRESS THE ISSUE

Russia, and other Arctic nations have recognized the importance of this problem. In 2009, the Tromsø Declaration of the Arctic Council, which has eight member nations including the United States and Russia, recognized that “*protecting the Arctic against potentially irreversible impacts of anthropogenic climate change depends mainly on substantially reducing global emissions of carbon dioxide and other greenhouse gases.*” The Council also highlighted the role of “short-lived climate forcers” such as black carbon on Arctic climate change. They stated that reducing emissions of these forcers has “*the potential to slow the rate of Arctic snow, sea ice and sheet ice melting in the near-term.*” The Arctic Council further decided “*to establish a task force on short-lived climate forcers to identify existing and new measures to reduce emissions of these forcers and recommend further immediate actions that can be taken.*” (7).

At the national policymaking level, the recent introduction of such framework documents as the Russian National Climatic Doctrine (12); the Russian Energy Strategy until 2030 (13); and, Federal Law No. 261 on Energy Efficiency are important steps towards the solution of this problem. However, lack of concrete mechanisms for practical implementation, the lack of appropriate technologies and low public awareness of the issue require further active legislative, technical and educational measures to address the problem (8). For example, after introduction of the Federal Law No 261, the Khabarovskiy Region Government had to cancel a series of regional legal acts which contained concrete measures to improve energy efficiency and, consequently, to reduce black carbon emissions (see Section 3.5 of this report). This happened due to conflicts with federal legislation. Introduction of the new Forest Code in 2007 significantly reduced forest fire prevention capacities at the national level. The catastrophic fires of 2010 have just confirmed the short-sightedness of that policy. The amendments to the Forest Code adopted so far to address this challenge are insufficient to significantly reduce risks of massive forest fires in 2011.

In the industrial sector, routine work on increasing energy efficiency of businesses (such as switching from coal to gas) automatically contributes to reducing incomplete combustion. However, the lack of economic incentives for such investments does not leave hope for significant reductions in black carbon from this source in the near future.

The least addressed part of the problem is related to traditional spring burning of agricultural lands which result in many grass fires (2). Besides the work of some NGOs (e.g. WWF, Greenpeace, etc.) and some rather formalistic measures of Russian municipal authorities, not much is done to increase awareness of rural citizens and, especially, farmers.

In December 2009, within the framework of the Copenhagen Summit, the Chair of the White House Council on Environmental Quality, Ms. Nancy Sutley, announced the Administration's intention to commit \$5 million towards international cooperation to quantify emissions and impacts of black carbon from fossil fuel and biomass burning and to reduce black carbon emissions and the associated warming effects in and around the Arctic.

To address the dominant source of black carbon deposition, the U.S. Department of Agriculture (USDA) has proposed a two-year multi-agency initiative to develop a better understanding of the relative black carbon impact of agricultural burning and forest fires, inform the design of black carbon mitigation programs, and implement pilot projects designed to demonstrate and evaluate agricultural burning and forest fire mitigation options. \$1.5 million was dedicated to this initiative. The proposal includes activities focused primarily on Russia but may also address black carbon sources in other Arctic and boreal countries.

Other departments (EPA, DOE, and, probably, NOAA) are working on their participation in implementation of the Black Carbon Initiative. A joint Russia – US Workshop on Methane and Black Carbon in the Arctic was held in Montenegro on October 13-14, 2010, chaired by representatives of Roshydromet and NOAA. Black Carbon has also been identified as a priority issue by the BPC's Working Group on Environment.

There is also an important international development in support of the US efforts initiated at COP 15: on December 17, 2010 the Swedish Environmental Protection Agency (Swedish EPA) and the Nordic Environment Finance Corporation (NEFCO) signed an agreement to set up a trust fund aimed at mitigating short-lived climate forcers (SLCF), including Black Carbon. The Swedish government has, through the Swedish EPA, committed SEK 1.6 million to the fund, which will finance Russian projects that reduce SLCF-emissions, including black carbon. The trust fund will be administered by NEFCO, and priority will be given to projects identified by the Arctic Council's Steering Group on SLCF. (9)

In GEF-5, the Russian Federation is proposing to develop a programmatic approach: *GEF-Russian Federation Partnership on sustainable environmental management in the Arctic* ("Arctic Agenda 2020"). The program aims to transform a system of environmental governance in the Arctic Zone of the Russian Federation by addressing key barriers of limited knowledge and capacity, inefficient institutional, legal and enforcement systems, and lack of investment in environmental technologies and innovation. One of the projects under this initiative is the *Arctic Black Carbon Pilot Project* that will include regulatory, capacity building and public awareness measures and targeted investments and demonstrations aimed at reduction of BC emissions in energy generation and land transport having measurable impacts. The emphasis at this stage will be on fuel alternatives substituting or increasing effectiveness of diesel and coal use in proposed sectors. The project should have global demonstration value and inform further interventions dealing with BC reduction in the Arctic and beyond (11).

ACTIONS NEEDED AND SCOPE FOR USAID INVOLVEMENT

At the moment, there is a need for wider information dissemination on BC among the Russian experts, policy makers and the general public.

USAID activities should be based on the currently approved USDA Black Carbon Initiative and implemented through FS, FAS, ARS and other agencies. For example, the project *Quantifying and mitigating the impact of forest fires and open burning* might contribute to solving this problem through the following mechanisms:

1. Ensuring information exchange between US and Russian monitoring agencies in the area of black carbon emission observations;
2. Organizing and supporting information exchange on Best Available Technologies that will ensure reduction of black carbon emissions from oil, energy, and transport enterprises;
3. Support of Russian and international NGOs and research institutions, as well as policymakers at the national, regional and local levels in increasing awareness among local citizens on the danger and harm of the burning of agricultural lands;
4. Facilitation of more effective cooperation between the US Black Carbon Initiative and the GEF-Russian Federation Partnership on the Arctic Agenda 2020.
5. Pilot projects to inform black carbon mitigation efforts aimed to improve local capacity and develop innovative mechanisms to reduce human-caused fires.
6. Capture of best practices, lessons-learned, and improving coordination on pilot activities. Additional support could be used to help share information, systematically capture best practices and strategies at these pilots, and hold workshops/meetings to provide a forum for coordination.
7. Building capacity on fire fighting/fire management efforts.
8. Practical alternatives to agricultural burning and outreach to farmers – through the development of courses and training modules for farmers on alternatives to burning alternatives. (10)

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CASE 2: PERMAFROST MELTING

NATURE OF THE ISSUE

The changes in the permafrost currently being observed in Russia are largely caused by the climate change which has taken place over the past century⁵⁵. Due to increased annual, summer and winter temperatures of up to 0.3-1.1 °C, the southern border of permafrost has shifted to the North. Many buildings erected on permafrost are being destroyed or damaged. The same is true for linear objects (roads, railroads, pipelines), which may cause consequent environmental damage. Coastal areas of the Arctic Sea are subjected to destruction from erosion, leading to release of great amounts of sediment, polluting the sea and causing some islands to disappear. Another environmental problem is enhanced greenhouse emissions of carbon dioxide and methane from frozen bogs and release of pollutants captured in frozen soil.

STATE OF KNOWLEDGE

Permafrost still covers an area of 22.8 million km² which is about 24 percent of the dry land in the Northern hemisphere. This area includes more than 60 percent of the territory of Russia⁵⁶. Permafrost is located not only in the Arctic, but also in alpine mountainous zones. Permafrost reaches its greatest vertical thickness (up to 1500 m), in the central areas of Siberia and in Yakutia (Fig. 1).

The most pronounced increases in average annual and winter temperatures have been found outside of the permafrost distribution area. In the summer period, the trends were above average in the Near-Ural Area, in Western Siberia, at Chukotka, and in the coastal areas, reaching 0.9-1.1 °C over 100 years. In 1970-2004, the All-Russian average trends for the average annual, winter, and summer air temperatures went up: 0.38 °C, 0.51 °C and 0.32 °C per decade respectivelyⁱⁱ.

The southern border of the permafrost distribution has shifted 30-40 km to the North in the Pechora depression, and significantly more - up to 80 km - on the Near-Ural plains. Moreover, there have developed numerous new *taliks* (patches of local permafrost melting), while the previously existing *taliks* have become deeper⁵⁷.

Destruction of the Arctic sea coast and islands has a special place among the numerous consequences of climate change affecting areas of permafrost. There are different types of

⁵⁵ Anisimov, O.A., V.A. Lobanov, S.A. Reneva, 2007. Analysis of air temperature changes in Russia and empirical predictions for the 1st quarter of the 21st century. *Meteorologiya i Gidrologiya*, 10: 20-30

⁵⁶ Gavrilova, M.K. 1981. *Modern Climate and Permafrost on the Continents*. Novosibirsk: Nauka Publ. (In Russian).

⁵⁷ Anisimov, O.A. (ed.), 2010. *The Main Natural and Socio-economic Consequences of Climate Change in Permafrost Areas: A Forecast Based upon a Synthesis of Observations and Modeling*. Greenpeace Russia, Moscow. 39 pp.

destructive processes, affecting most seriously those containing large amounts of ice (the so-called ice complexes). Frozen sea coasts make up more than one-third of the Eastern Siberia coast, and have been retreating with speeds ranging from 0.5 to 25 m per year. The destroyed coastlines of the Eastern Siberian sea produce a great amount of fragmentary coastal material (on average, 152 million tons per year) and organic carbon (4 million tons per year).

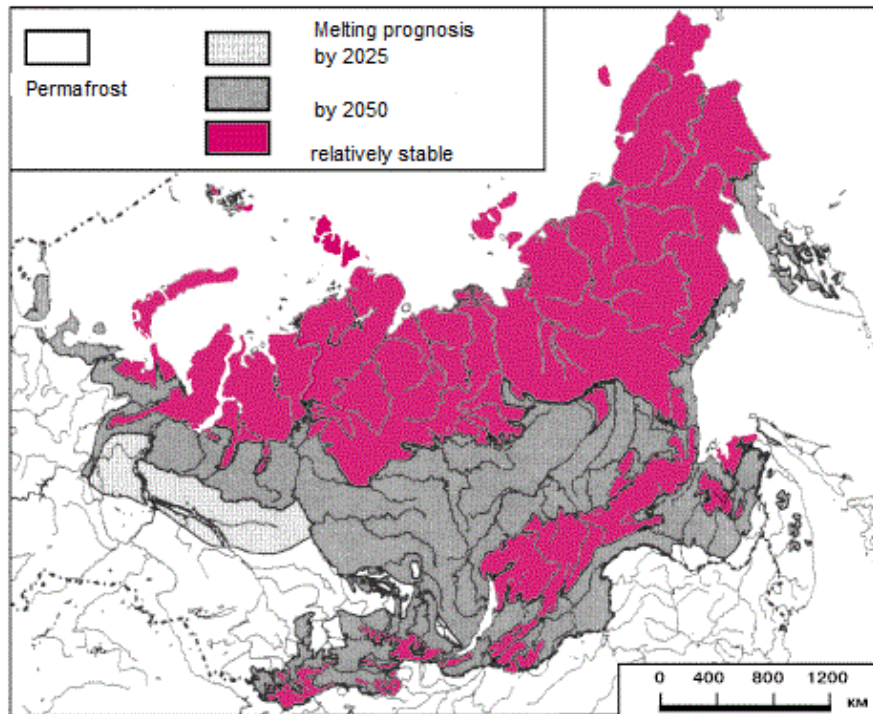


Figure 1. Map of permafrost distribution across Russia with prognosis of melting by 2025 and 2050⁵⁸.

An important aspect of the problem is environmental safety. Over the years, the environment of the Arctic regions has become increasingly polluted with long-lived hazardous substances from petroleum development, military sites, and other construction, accumulating in the frozen soils. As the temperature rises, these pollutants could move out of the ice and permafrost and penetrate the human environment.

There is likely reinforcement of the greenhouse effect due to growing emissions of greenhouse gases, especially methane, as permafrost thaws – a positive feedback loop. The results obtained with the aid of a diffusion-kinetic model of carbon gas exchange show that, by the middle of the 21st century, methane emissions may grow more than 50 percent near the Arctic coast and by 30-50 percent across most of the discontinuous permafrost zone.

This change may intensify geo-cryological processes, which adversely impact the stability of constructions built upon permafrost. Over the past two decades, the number of accidents and damage to facilities located in the permafrost zone has increased significantly. Among the oil and gas pipelines of Western Siberia, there are around 35,000 accidents annually. About 20 percent of these are caused by mechanical impacts and deformations. The number of buildings

⁵⁸ <http://prognosis.fromru.com/>

damaged in 1990-99 increased (in comparison to the previous decade) by 42 percent in Norilsk, and 61 percent in Yakutsk⁵⁹.

EFFORTS TO DATE TO ADDRESS THE ISSUE

In the 1950s, several geo-cryological stations were established by the Yakutsk Institute for Permafrost Studies. In the mid-1990s, an international network for monitoring the depths of seasonal permafrost thawing had been created (CALM). Currently, it includes 168 sites located in the Northern hemisphere. Among them, more than 20 sites are located within the territory of Russiaⁱⁱⁱ.

While data was being gathered from observations in the field, mathematical models for permafrost were developing and improving. In 1990, the First Assessment Report of the Intergovernmental Panel on Climate Change (*IPCC*) was published. Further IPCC reports were published in 1995, 2001, and 2007⁶⁰. In 2005, the Arctic Climate Impact Assessment (ACIA) was published.

In Russia, the following documents were prepared by the Russian Ministry for Hydrometeorology and Environmental Monitoring Agency (Roshydromet):

2005 - Strategic Forecasting of Climate Change in the Russian Federation for the Period until 2010-2015 and its Impact on Russian Industries;

2008 - Assessment Report on Climate Change and its Consequences on the Territory of the Russian Federation;

2009 - Climate Doctrine of the Russian Federation (which, for the first time, formulated the country's position about climate change, and set national priorities and adaptation objectives)⁶¹.

ACTIONS NEEDED AND SCOPE FOR USAID INVOLVEMENT

While there exists a general understanding of this problem, a detailed assessment of potential economic losses is still lacking.

- 1) The lack of a plan of action in Russia is a serious problem. A long-term strategy for adapting infrastructure to climate change has to be adopted. It is necessary to work out response strategies (particularly, adaptation measures) for several regions, which must become a state priority.
- 2) Almost all Russian permafrost construction specialists do not yet consider climate change as a factor able to cause large-scale permafrost changes, significantly beyond the limits of natural variability.
- 3) Existing regulations for the construction and operation of buildings and facilities in permafrost areas do not consider any changes in climate. As a result, Russia currently has no legal framework which could serve as a basis for the development of an assessment of economic losses associated with the necessity of account for forecast permafrost changes.

⁵⁹ Anisimov, O.A., M.A. Belolutskaya, 2002. Estimated impact of climate change and permafrost degradation on the infrastructure of the Northern regions of Russia. *Meteorologiya i Gidrologiya* 6: 15-22.

⁶⁰ <http://www.ipcc.ch/>

⁶¹ Climate Doctrine of the Russian Federation, signed by the President of the Russian Federation on December 17, 2009.

4) Methods of assessing economic losses and profits caused by climate change for industries have to be developed. This could be adopted from the US approaches via technology sharing with Russia.

USAID could get involved into permafrost melting issue in Russia

- Supporting exchange of scientific information
- Translating existing information in Russian for international audience
- Holding conferences
- Supporting energy efficiency programs and the Black Carbon Initiative, which could potentially slow down permafrost melting.

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ⁱ Anisimov, O.A., V.A. Lobanov, S.A. Reneva, 2007. Analysis of air temperature changes in Russia and empirical predictions for the 1st quarter of the 21st century. *Meteorologiya i Gidrologiya*, 10: 20-30

ⁱⁱ Gavrilova, M.K. 1981. *Modern Climate and Permafrost on the Continents*. Novosibirsk: Nauka Publ. (In Russian).

ⁱⁱⁱ <http://prognosis.fromru.com/>

^{iv} Anisimov, O.A. (ed.), 2010. *The Main Natural and Socio-economic Consequences of Climate Change in Permafrost Areas: A Forecast Based upon a Synthesis of Observations and Modeling*. Greenpeace Russia, Moscow. 39 pp.

^v Anisimov, O.A., M.A. Belolutsкая, 2002. Estimated impact of climate change and permafrost degradation on the infrastructure of the Northern regions of Russia. *Meteorologiya i Gidrologiya* 6: 15-22.

^{vi} <http://www.ipcc.ch/>

^{vii} Climate Doctrine of the Russian Federation, signed by the President of the Russian Federation on December 17, 2009.

CASE 3: COAL MINE METHANE AND COAL BED METHANE UTILIZATION

NATURE OF THE ISSUE

Methane (CH₄) is one of the six major greenhouse gases, representing approximately 10 percent of global GHG emissions. Unlike CO₂, it can be used as a clean energy source; thus its capture and use, in lieu of emissions, can provide positive environmental benefits. Methane is the main greenhouse gas related to coal production. It is produced from underground and surface mines and as a result of post-mining activities, including coal processing, storage, and transportation.

Coal mine methane emissions need to be distinguished from coal bed methane and abandoned mine methane. Coal bed methane (CBM) – gas contained in coal seams, often referred to as virgin coal bed methane, may be exploited as a natural gas resource. Coal mine methane (CMM) is the gas that is released immediately prior to, during, or subsequent to coal mining activities, and, being vented to the atmosphere, has climate change impacts. Abandoned mine methane (AMM) is methane that continues to be released from the coal bearing strata once a mine is closed and sealed. RosTechNadzor, Russia's state safety regulator, has pointed to excessive levels of CMM resulting from violations of ventilation requirements as the key cause of explosions.

STATE OF KNOWLEDGE

Coal bed methane

Russia is estimated to have significant CBM resources – 75-80 trillion m³ in coal seams. Methane resources in Kuzbass are 2.49 trillion m³ above 600 meters below ground and 7.45 trillion m³ between 600 and 1,200 meters. There are no production boreholes in Kuzbass, but there are approximately five experimental ones. CBM projects are still at an early stage, but they could be economically feasible in the future, when gas prices may go up.

CBM, like any other mineral resource in Russia, is owned by the state. A license is required for methane extraction. There are three types of licenses: exploration license, production license, and combined license. The license is applied for at the Territorial Authority representing the Federal Ministry of Natural Resources and Environment, which publishes a tender announcement. The tender is held with a minimum starting price determined by the Federal Agency and it typically takes about a year to obtain a license.

Coal mine methane

Globally, coal mine methane (CMM) accounts for 6 percent of total methane emissions caused by human activities. The Russian Federation is the world's third largest emitter of CMM (accounts for an estimated 6 percent of global CMM emissions, releasing almost 2 billion cubic meters (Bm³) into the atmosphere each year) and possesses a vast potential for its productive utilization. In Russia, CMM is a serious safety hazard in coal mining operations. At this time, CMM use licensing lacks clarity. Currently, according to some officials, extracted methane can be used to meet the mine's own needs, but a license is required to sell methane utilization products.

CMM emissions are expected to grow. Current official projections suggest that Russian coal production will grow from 323 Mt in 2008 up to 325-400 Mt in 2020 (although the current global economic crisis increases the uncertainty in this projection). Moreover, the outlook in Russia is for an increasing share of that coal production to come from deeper underground mines with higher CMM release. Hence, the increase in CMM emissions could be even greater than the proportional increase in underground coal production. Russian experts project CMM emissions to grow as much as 4 percent per year, if no action is taken to enhance CMM recovery and use in Russia. This raises a range of issues related to mine safety and to global climate change.

CMM in Russia is primarily located in three coal basins (Fig.1): Kuznetsk, Pechora, and Donetsk ("Donbass", the majority of which is situated in Ukraine).



Fig. 1 Russia's three main coal basins

The Kuzbass accounts for 78 percent of CMM reserves located in the former USSR, and the Pechora Basin accounts for 12 percent (Ugilemetan, 2004). The CMM resources of the Kuznetsk coal basin in Russia amount to over 13 trillion cubic meters. Presently, 47 coal mines operate in the region and emit 216 Mm³ of methane per year but, unfortunately, none of them attempts to utilize drained methane. Development of CMM recovery and utilization is of great technological, economical and ecological importance for Kuzbass. The Kuzbass also has many gassy mines that do not drain methane. If methane drainage systems were installed at those mines, significant amounts of methane could be recovered.

Currently in Russia only limited amounts of CMM are recovered and used: only about 317 Mm³ was recovered by degasification or methane drainage systems in 2008. The volume of methane that is actually used at the mine site or for local electricity and heat generation is much smaller, totaling only 40 Mm³ per year. Despite the fact that degasification allows an increase in the output from coal faces and thus enhances the economics of coal production, only 25 percent of active mines in Russia have installed degasification systems. This is especially a concern given the relatively high methane content of Russian coal compared to coal mined elsewhere around the world.

Currently, leading edge technologies for CMM recovery and use are installed in only a few mines by coal companies in Russia. A major project at the Kirova mine in the Kuznetskiy basin is, however, being developed to increase the rate of methane drained and utilized.

In Russia, the key driver for methane recovery is the safety of underground mining. Improved safety would in turn lead to improved labor and mine productivity. Methane-related accidents at coal mines in Russia are principally due to non-compliance with safety regulations. The high level of methane release at Russian mines increases the risk of accidents. Mine productivity is affected by this – accidents clearly reduce productivity and, indeed, mine operations must be shut down when the methane content in ventilation air is above a certain prescribed level. Major

mine explosions have heightened the focus on mining safety in Russia and led to new coal mine methane limits and safety regulations being established. The key to ensuring mine safety in Russia is the effective adherence to these mine safety regulations.

Explosions and fires due to hazardous concentrations of methane in Kuzbass mines have caused many fatalities throughout the history of mining in the Kuzbass. Because ventilation alone is not always sufficient to remove methane from gassy coal mines, more than half of active Kuzbass mines employ methane drainage systems in addition to ventilation. These mines drain more than 120 Mm³ of methane annually that could potentially be used as fuel, but instead is vented to the atmosphere. Fifteen mines are responsible for more than 90 percent of the methane drained in the Kuzbass. These mines may represent the best targets for methane utilization projects, since they already have drainage systems in place. At most of these mines, significantly more methane could be drained with improvements in drainage technology and monitoring practices, as indicated by the large quantities of methane drained at each mine.

Secondary drivers for CMM recovery are the interest in reducing greenhouse gas emissions and bringing additional clean fuel into the local fuel mix.

The high methane content of coal in Russian mines should make them attractive hosts for projects focused on methane recovery and use. If all of the 1.9 Bm³ of CMM emissions released annually in Russia could be recovered and used, there would be a potential value of about US\$ 130 million at 2008 regulated wholesale natural gas prices in Russia. That said, the improvement of mine productivity from safe methane recovery would remain an even stronger economic driver.

The utilization of CMM energy e.g.in heating and power stations or co-firing in industrial boilers, could contribute to the conservation of fossil fuels, to the diversification of energy resources, and to the reduction of climate-relevant emissions. However, today CMM is used only to a very small extent. The main barriers are:

- insufficient knowledge about the different possibilities and concepts for use of CMM,
- varying gas compositions,
- fluctuating and unpredictable gas quality and amount,
- lack of economical options for CMM gases with low methane content (< 15 percent) and
- differing country and site specific infrastructure and administrative conditions, as well as different economic conditions, impeding an easy transfer of already applied technologies and concepts.

Therefore, the elimination of barriers, as well as the stimulation of enhanced use of CMM as fuel, is an important issue related to the reduction of GHG emissions.

A quite comprehensive overview of problems related to CMM capture in Russia has been provided in the Information Paper: *Coal Mine Methane in Russia*, published by the International Energy Agency in 2009 (1).

EFFORTS TO DATE TO ADDRESS THE ISSUE

In recent years, there has been considerable international interest in the recovery and use of methane, which has been the major focus of the multilateral **Methane to Markets Partnership (M2M)**, that is a public-private partnership of 29 national governments and over 900 private organizations working to advance methane capture and use projects in the coal, agriculture, landfill, and oil and gas sectors in partner countries (<http://www.methanetomarkets.org>).

Russian mines are subject to safety regulations. A “Guide for Safe Operation of CMM Energy Units” has been prepared by the local mine safety institute in Kuzbass to provide guidelines to coal mines for the safe installation of CMM recovery and utilization systems. According to the regulations, drained gas must have a minimum methane concentration of 30 percent to ensure that it is not within the explosive range. In addition, the regulations cover various aspects of flame safety (using flame arresters, etc.), but Kuzbass mines do not flare gas emissions at this time (Tailakov, 2005c).

There have recently been some positive regulatory and energy market developments that could prove stimulating for CMM utilization on a larger scale. These developments include government decisions on gradual price increases for natural gas for industrial and residential users, liberalization of the electricity market, and inclusion of CMM in the list of renewable energy sources in the 2007 Amendment to the Law on United Energy Systems.

The UNDP/GEF Project: “*Russia – Removing Barriers to Coal Mine Methane Recovery and Utilization*” has been underway since 2003 and will conclude on 31 December 2010. Specific outcomes from the Project are as follows:

- Establishment and Capitalisation of the “Coal Mine Methane Recovery and Utilisation Company (CMMRUC)”;
- Raised public awareness and training of coal mining companies and Russian mine regulators;
- Successful implementation of the Modular Boiler System demonstration at SDS-Ugol’s Krasnogorskaya Mine and implementation of secondary CMMRUC projects by coal mines;
- Making necessary recommendations for the changes needed in the existing legal and regulatory framework and implementing those changes;
- Monitoring, evaluating and disseminating the project results and lessons learned.

CMMRUC cooperates with all key stakeholders and also strives to be a committed advisor in eliminating political, institutional, technical and technological barriers in major aspects of coal mine methane recovery and utilization. The sustainability of CMMRUC will be dependent on its marketing efforts and development of CMM projects in Russia. Fortunately, SUEK, the largest coal mining company in Kuzbass, has a consistent approach to CMMRU projects. Hopefully the Russian JI Program will be continued so that it provides SUEK, and other coal mining companies, the incentive to implement more such projects.

Basic efforts are directed to provide CBM/CMM projects related essential information and analytical services to interested parties. The customers and stakeholders include public organizations, government agencies, coal mining companies and potential investors.

A project for the *Development of Coal Mine Methane Projects in Central and Eastern Europe and the Commonwealth of Independent States*, was implemented in 2004-2008 by the United Nations Economic Commission for Europe (UNECE) and received funding from the US Environmental Protection Agency (USEPA), to provide technical assistance to coal mines in Russia and other countries to develop early stage bankable documentation for CMM projects and to introduce such projects and their sponsors to potential investors (7). Through this project, the UNECE sought to catalyze project development, through support of the early activities that are necessary, but often overlooked, in conceptualizing, planning and implementing a CMM project.

The EU project *CoMeth (Coal Mine Methane – New Solutions for Use of CMM – Reduction of GHG Emissions)* was launched in November 2008. The overall objective of the project is to contribute to reducing greenhouse gas emissions caused by the uncontrolled release of coal mine methane to the atmosphere and to the identification of suitable, economically promising schemes for utilization of CMM. The CoMeth consortium brings together researchers from six countries (Germany, Poland, Russia, Ukraine, Kazakhstan and the United Kingdom) collaborating for a period of three years.

The USEPA Coalbed Methane Outreach Program (CMOP) recently approved the *Ventilation Air Methane (VAM) at Russian Coal Mines* for financing in 2011-2012. CMOP is a voluntary climate change program begun in 1994. It promotes the profitable recovery and use of CMM and supports CMM project development in different countries. The VAM project aims at improving the measurement of ventilation air methane emissions in the Kuznetsk Coal Basin. This would lead to the use of VAM as a potential clean fuel for energy production. There will be relevant pre-feasibility studies developed to set up favorable conditions for VAM technology deployment at coal mines in Kuzbass. The project will start in February 2011.

As stated in the strategic documents on energy policy, CMM utilization is becoming an important issue for the Russian Government. However, to engage the companies more actively in practical activities the government should make targeted efforts to develop capacity and provide economic incentives.

ACTIONS NEEDED AND SCOPE FOR USAID INVOLVEMENT

The US Government, through USEPA) has already provided substantial support to the solution of CMM problems through the UNECE project and currently through the VAM Project. USAID could consider providing support to the new *Coal Bed Methane Project* (included in the plan of the BPC's Energy Working Group) through the following possible activities:

- business – to business technological cooperation for recapture and utilization of coal mine methane; support to access financing for project implementation;
- participation in organizing a workshop on CMM prospects in Russia scheduled in June 2011 (in Kemerovo);
- support for the preparation of new technological norms and standards relevant to CMM capture and utilization.

USAID could focus its involvement on engaging non-governmental organizations and other stakeholders in dissemination of information about best practices for CMM and CBM projects in the USA, aiming to develop technical capacity in Russia on the issue.

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CASE 4: POTENTIAL TO INTRODUCE MEASURES TO PREVENT NATURAL GAS LOSS AND LEAKAGE DURING PRODUCTION AND DISTRIBUTION

NATURE OF THE ISSUE

This brief addresses two issues: **leakage of natural gas (methane) from pipelines** and **flaring (burning) of the natural gas produced along with oil (associated gas)**.

The gas distribution network of low and medium pressure in Russia is about 500,000 kilometers, with installed transportation capacity of 350 Bm³/yr. of natural gas. In most of the regions, the gas networks are outdated and require urgent improvements, both in terms of modernization of the pipeline systems and compressor equipment and the management standards and technical requirements and norms.

The current practice of gas distribution leads to substantial leakage of natural gas. While data on such losses cannot be considered reliable, in 2008, **fugitive emissions** from leakage and evaporation of fuels in Russia were reported at 401.4 million tons, that is about 18.5 percent of total emissions of GHGs in the country. Methane emissions accounted for 92.5 percent of the total fugitive emissions (National Inventory, 2010).

Addressing the Russian parliament in November 2009, President Dmitry Medvedev highlighted the **flaring of gas** extracted alongside oil as one of the most glaring examples of ineffective use of energy resources. According to the Russian press, at present, only 25 percent of the country's associated gas is used, with the remainder being flared.

STATE OF KNOWLEDGE

Prevention of **fugitive methane emissions** through reduction of natural gas leakage in the gas distribution sector would prevent a range of negative impacts, including:

- *economic impacts* – direct losses of economic benefits from leakage of natural gas; improper pricing of natural gas in the domestic market; inefficient use of the basic natural resource;
- *energy sector impacts* – inefficient natural gas consumption; limitation of gas supply, especially in the long-run;
- *social impacts* – the natural gas leakage is paid for by the population, that especially affects the well-being of poorer groups;

- *environmental impacts* – leakage of gas has negative impacts on the global climate; increases the risk of natural gas explosions; limitation of gas supply leads to a shift to coal and fuel oil consumption, resulting in increased environmental pollution.

According to official statistics, Russian oil producers flare a total of 15 Bm³/year of **associated gas**. Vladimir Putin's 2007 State of the Union address quoted a figure of over 20 Bm³/year. A 2006 study by the International Energy Agency (IEA) used satellite data and data from the US National Atmospheric and Oceanic Administration (NOAA) to estimate that approximately 60 Bm³/year of associated gas and gas from condensate stripping are flared annually in Western Siberia, where most of Russia's oil is produced (Chart 1).

ESTIMATED FLARED VOLUMES FROM SATELLITE DATA, 2005-2009

Volumes in bcm	Estimated flared volume from satellite data					Change from 2008 to 2009
	2005	2006	2007	2008	2009	
1 Russia	58.3	50.0	52.3	42.0	46.6	4.6
2 Nigeria	21.3	18.6	16.3	15.5	14.9	(0.6)
3 Iran	11.7	12.2	10.7	10.9	10.9	0.1
4 Iraq	7.0	7.2	6.7	7.1	8.1	1.0
5 Kazakhstan	6.2	6.2	5.5	5.4	5.0	(0.4)
6 Algeria	5.7	6.4	5.6	6.2	4.9	(1.2)
7 USA	2.8	2.8	2.8	4.0	4.0	0.0
8 Saudi Arabia	3.4	3.7	3.8	3.8	3.5	(0.3)
9 Libya	4.6	4.4	3.8	4.0	3.5	(0.5)
10 Angola	4.7	4.0	3.5	3.5	3.4	(0.1)
11 Mexico	1.9	2.1	2.7	3.6	3.0	(0.6)
12 Venezuela	2.2	2.1	2.2	2.7	2.8	0.1
13 Indonesia	3.0	3.2	2.6	2.5	2.5	0.0
14 China	3.0	2.9	2.6	2.5	2.4	(0.1)
15 Qatar	2.3	2.3	2.4	2.3	2.2	(0.1)
16 Oman	2.6	2.3	2.0	2.0	1.9	(0.1)
17 Canada	1.3	1.7	2.0	1.9	1.8	(0.1)
18 Egypt	1.7	1.7	1.5	1.6	1.8	0.2
19 Kuwait	2.5	2.5	2.2	2.0	1.8	(0.2)
20 Uzbekistan	2.7	2.9	2.1	2.7	1.7	(0.9)
Total top 20	149	139	133	126	127	0.7
Rest of the world	23	22	21	20	20	(0.2)
Global flaring level	172	162	154	146	147	0.5

Source: NOAA Satellite data

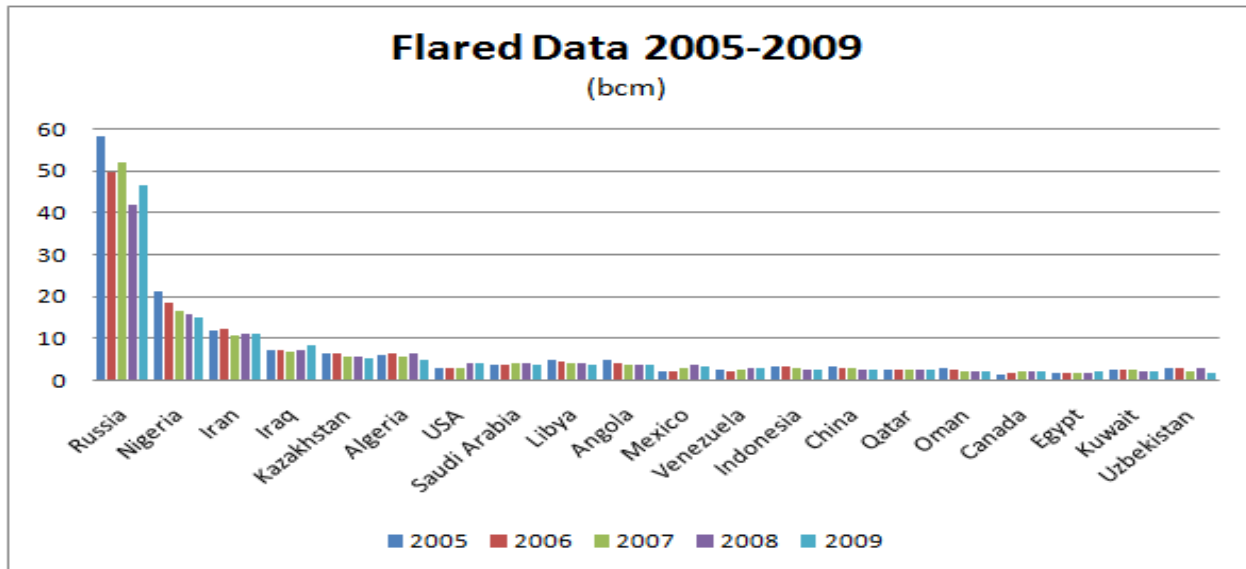
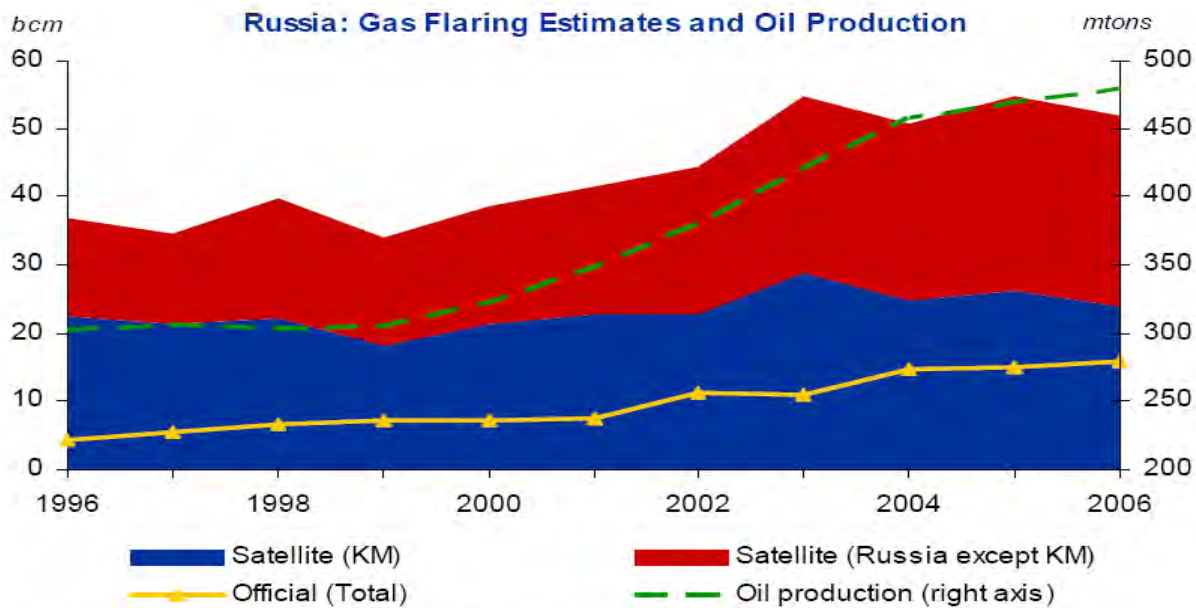


Chart 1 below shows the various estimates of Russian APG flaring. Russian oil production is shown on the right hand scale. According to all estimates, Russia is the largest emitter of the associated gas in the world



Source: IEA, NOAA, World Bank, Ministry of Energy of the RF, RIA TEC

Chart 1. (KM - Khanty-Mansiysk Autonomous Okrug/Region)

There are a number of economic, structural, political and other reasons why Russia flares so much gas, including:

Geographic: associated gas is produced at multiple small fields spread over a vast and thinly populated region, Western Siberia, with few local uses for the gas.

Regulatory: Russian federal law has not historically required companies to minimize gas flaring, although this is slated to change. There is essentially no official monitoring of flaring levels. Fines are small and gas utilization requirements, where these exist, are rarely enforced.

Structural: Gazprom has a monopoly on gas transportation and other gas producers do not have open and transparent access to its pipeline network.

In 2007, PFC Energy conducted a study “Using Russia’s Associated Gas” on behalf of the Global Gas Flaring Reduction Partnership (GGFR) and the World Bank. PFC Energy estimates that it could be economically viable to utilize 30-80 percent of the flared gas in Russia, generating several billion US dollars in annual value and eliminating 30 - 80 million tons per year of carbon dioxide emissions. The Study’s main conclusions/recommendations were:

- Unlocking the value of Russia’s associated gas will require significant changes in Russia’s legislation and regulatory system, including more effective monitoring and enforcement;
- Legislation alone will not achieve the goal of reducing gas flaring, as long as economic distortions and structural barriers inhibit the commercialization of associated gas;
- The economic incentive to use associated gas will increase as domestic gas prices continue to rise toward international levels, net of transportation costs;
- It is crucial for Russia to create a system under which all producers have open and transparent access to the major gas transportation system, and to enforce that access with independent regulatory measures.

EFFORTS TO DATE TO ADDRESS THE ISSUE

A project aimed at improving estimation of **fugitive methane emissions**, creation of an information and institutional base for methane emission control was implemented in 2003-2004 by the Regional Environmental Center, Russia with financial support from the Global Opportunities Fund (GoF). The project titled “Support for Russian Gas Industry to Participate in Kyoto Mechanisms” aimed to identify the gaps in the preparation of the Russian gas distribution sector to participation in the flexibility mechanisms of the Kyoto Protocol, as well as priority areas and possible ways to fill these gaps. It became clear due to this project that the practical steps for fugitive methane emission control in Russia should be undertaken on a rather large scale, as there is a long list of low-cost measures and possibilities for that.

In order to coordinate the preparation to restructuring of the gas distribution sector, in 2004 Rosgazification established a special daughter company “Centergazservice-opt” the main tasks of which were defined as development and implementation of investment projects in modernization of the gas systems, and development and realization of the unified accounting system for natural gas consumption. In 2006 -2008 Rosgazification and “Centergazservice-opt” have developed and implemented about 30 projects in different regions on improving the integrity of regional gas distribution networks via reducing leakage of methane from the system. This was accomplished by activities that detect, measure and repair leakages at gas regulator stations in flanges, tube fittings, pipe thread connectors, block valves, regulators, plug valves and pressure relief valves. The projects were determined and preliminary registered in accordance to international procedures established by the Kyoto Protocol with total emission reductions about 80 million ton CO₂ for the period 2008 – 2012. However, the projects have not been approved as JI projects by the Russian Government.

In early 2009, the government passed a resolution entitled “On the Measures Stimulating Reduction of Atmospheric Pollution by Products of Associated Gas Flaring.” The document set a target for 2012 and beyond of limiting flaring levels to only 5 percent of the entire associated

gas output. Starting Jan. 1, 2012, producers will have to pay increased fees for excessive flaring. The fees will be increased by 4.5 times.

Despite the obstacles placed before them, some Russian oil companies have made significant strides in utilizing Associated Gas among them: Surgutneftegaz, Sibur, TNK-BP, and TatNeft. In 2007, Surgutneftegaz achieved the highest level of associated gas utilization in Russia equal to 95 percent. TNK-BP and Sibur set up a joint venture Yugragazpererabotka JV in order to ensure maximum efficient receiving and processing of all available associated gas (Russian Gas Flaring, 2009).

On July 23, 2010, the World Bank's first Joint Implementation (JI) Gas Recovery Project in the Komsomolskoye Oil Field was approved by the Ministry of Economic Development of the Russian Federation. It was one among 15 JI projects under the Kyoto Protocol in Russia. The Associated Gas Recovery Project in the Komsomolskoye Oil Field is located in the region of Yamal-Nenez, and is jointly developed by OJSC NK Rosneft and the World Bank.

"We greatly appreciate efforts of the Russian Government aimed at increasing revenues from efficient consumption of associated gas recovery. The JI project at the Komsomolskoye oil field is a unique demonstration of the synergy of interests, including the ones of the government, business community and the general public. The implementation of Kyoto Protocol mechanisms will help reduce economic barriers to the modernization of the Russian oil and gas industry as well as foster implementation of new important projects in this area.", commented OJSC "NK Rosneft.

In addition to the reduction in greenhouse gas emissions, the above projects have demonstrated important ancillary benefits, such as gas conservation, to the benefit of end users of gas, health effects, due to the elimination of asbestos as a repair material, lower risks of accidents related to gas leaks and dissemination of modern technology related to leak detection and repair as well as improved measurement practices, all of which have great replication potential throughout Russia.

ACTIONS NEEDED AND SCOPE FOR USAID INVOLVEMENT

While the issues of reducing fugitive emissions from gas pipeline leakage and minimizing the flaring of associated gas remain of great priority for Russia, and much work remains to be done, there does not appear to be an obvious role for USAID to play at this time.

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CASE 5: INVASIVE SPECIES

NATURE OF THE ISSUE

Invasions of alien species of various groups of living organisms beyond their natural ranges have a global scope. Invasive species constitute a biological disturbance for ecosystems and may threaten the environmental safety of a country. Their introduction and further spreading can often lead to negative environmental, economic and social consequences.

There are a number of examples showing the severity of the problem in Russia. The area covered by Colorado potato beetle has increased 12,000 times over the last 30 years, reaching 3 m ha. According to the Russian Academy of Agricultural Sciences, some regions lost up to 40 percent of their potato harvest in 1999. Highly allergenic common ragweed (*Ambrosia artemisiifolia*) is distributed by now over 6 m ha, and causes widespread suffering among the population. In marine environment, overfishing and destruction of sea grass beds led an invasion of singular ctenophore (comb jelly) *Mnemiopsis leydii* which enhanced this process in Black, Azov, and Caspian Seas. Only in the first two seas, it had caused lacks for fisheries ca. 250-300 mln USD a year. The mollusk *Dreissena polymorpha* (Zebra mussel) has distributed along man-made channels connecting rivers from Caspian Sea to Baltic Sea, and later got to North America. The presence of this mollusk severely changes the structure of aquatic ecosystems, as well as hindering then operation of water intakes⁶². In the Sea of Japan, invasive crabs fill in the nets preventing fishing.

There are a number of species requiring special attention due to their expanding areas approaching Russia. Among of them, Western corn rootworm (*Diabrotica virgifera virgifera*) has invaded 13 European countries, including Ukraine, during the last 10 years. A number of thrip species, small insects sucking plant tissues, are especially dangerous, due to their connection to greenhouses, where they spoil vegetables and flowers. Some of them are likely to get to Russia⁶³. There is a list of pests dangerous to forests (*Agrius planipennis*, *Corythucha ciliate*, *Liriomyza huidobrensis*). Among mammals, there are 62 species that have changed their distribution in, or invaded Russia^{iv}.

New waves of invasion by alien species appear constantly. These agents enter the country with soil, flowers, seeds, bushes and trees in pots, sawn timber, crates, and with ballast waters in vessels.

STATE OF KNOWLEDGE

Biological invasions are all cases of introduction of species beyond their native range. They can be distributed for reasons reasons. They could be natural changes of the area connected to abundance fluctuations and GCC. However, the majority of changes are caused by human activity, such as the introduction or re-introduction of economically important species. Besides, occasional introduction with ballast water, with imported agricultural products, luggage etc. may take place too.

Across the globe, studies on alien species are improving⁶⁴. Since Russia is among the countries which signed Convention on Biodiversity in Rio de Janeiro in 1992, it has developed measures

⁶² Dgebuadze, Yu.Yu. 2002. Problems of alien species invasions // Environmental safety and invasions of alien species. Proceedings of the Round table of All-Russian Conference on Environmental Safety (June 4-5, 2002). Severtsov Institute of Ecology and Evolution, Moscow; IUCN, 2002. P. 11-14.

⁶³ Izhevsky, S.S., Maslyakov, V.Yu., 2008. New invasions of alien insects into European Part of Russia. Russian Journal of Biological Invasions. V. 2. P. 45-54.

⁶⁴ Global Invasive Species Programme (GISP) (www.gisp.org)

to prevent, monitor and mitigate alien species invasions. There is a wide range of studies reporting the spread of alien species. The main negative impact of invasive species on native ones can be summarized as follows.

1. Invasive species may substantially change the environment for native species, especially when the invasive species are key or engineer species.
2. They could become competitors for native species and lead to their extinction.
3. They could also be predators to the native species and bring them to extinction.
4. Invasive species may carry diseases for native species or be causative agents themselves.

EFFORTS TO DATE TO ADDRESS THE ISSUE

At the moment, there are a number of legislative acts in Russia that regulate alien species. Some questions are highlighted in federal laws:

Federal Law of RF on April 1, 1993, #473 «About the state boundary of RF»;

Federal Law of RF on March 22, 1995. «About animal world». Article 25. Relocation and hybridization of objects of animal world.

Federal Law of RF on December 20, 2001 «About environmental protection». Article 50. Protection of the environment from negative biological influence.

The majority of legislative acts have a departmental influence. There is no National Strategy on alien species in Russia. The majority of legislation concerns invasive species harmful for crop production. The most important are the following.

Decree of government of RF on April 22, 1992 #268 “Statute of the state service on plant quarantine in RF”.

Decree of government of RF on February 25, 1998 “Rules on the protection of RF territory from quarantine pests, plant diseases and weeds”.

Federal Law of RF on July 15, 2000 “About quarantine of plants”.

“A list of quarantine pests, plant diseases and weeds in RF” is accepted by the Ministry of Agriculture in 2003.

Some regulations are following due to RF signed some international agreements.

International plant protection convention (1951, 1979, 1997). It contains 23 articles, and 8 of them regulate delivery of phytosanitary and quarantine security when international trading and conveyance.

Agreement of World Trade Organization about application of sanitary and phytosanitary measures (1994).

International agreements on quarantine and plant protection between the Government of RF and Governments of some other countries.

The protection on the territory of RF from the quarantine species is in the responsibility of the State Service on Plant Quarantine, which was recently transformed into the Federal Service on Veterinary and Phytosanitary Watch, Rosvetkontrol) according to the Decree of Government of RF on June 30, 2004, #327.

Scientific research has been summarized in a web-portal on invasive species⁶⁵. Moreover, the Russian Academy of Sciences publishes a new peer-reviewed *Russian Journal of Biological Invasions*.

ACTIONS NEEDED AND SCOPE FOR USAID INVOLVEMENT

The main directions to prevent further biological invasions may include the following:

- 1) Research on the invasive peculiarities of various organisms (fungi, plants, mollusks, insects, fish, and mammals);
- 2) Finding main invasive corridors, or pathways and directions of distribution of alien species;
- 3) Forecasting invasions of alien species, e.g. by monitoring nearby territories;
- 4) Damage assessment of alien species on ecosystems, economy and social issues;
- 5) Development of information databases on alien species;
- 6) Development of legislation and improved enforcement of existing rules.

There is a need for broader information for population, legislature, and scientific communities about the problem of alien species. There is sometimes a problem of found alien species being hidden, especially in private greenhouse farms. A good start could be initiating an information center on biological invasions towards terrestrial and aquatic ecosystems of Russia. One of possible activities is coordination of various specialists and organizations on the issue of biological invasions.

The Federal Service on Veterinary and Phytosanitary Watch is not able to prevent alien species invasions on its own without broad interaction with the public, NGOs and research institutions. Further reforms in the Service are needed, especially in legislation (Law on Phytosanitary Quarantine) and its synchronization with other Federal Laws (Law on Environment Protection) and international acts signed by Russia.

While the subject is of considerable importance to Russia, it does not appear to be a good candidate for USAID support at this time, except possibly as an element of the USFS program to support Russian forestry, in the area of forest pests.

CASE 6: ENVIRONMENTAL MANAGEMENT OF LAKE BAIKAL

NATURE OF THE ISSUE

Lake Baikal is a truly extraordinary place. It holds 20 percent of our planet's fresh unfrozen water (in volume slightly more than all the North American Great Lakes combined) and contains a truly unique ecosystem whose extremely high levels of biodiversity and endemism helped Baikal obtain UNESCO World Heritage Site status in 1996.

Baikal's history of environmental activism and legislation is also unique in Russia. Baikal has been a focus of environmental campaigns in Russian since the late 1950s. It is also the subject of unique federal environmental protection legislation (i.e. Law about Baikal, passed in 1999, which disregards administrative boundaries, providing protection based on ecological zonation) and has seen a number of unique environmental government institutions over the years (for

⁶⁵ <http://www.sevin.ru/invasive>

example, the coordination agencies—Baikal Commission, followed by Baikalpriroda, followed by the current inter-agency commission in Moscow).

Baikal represents a singular conservation opportunity since, unlike most large freshwater bodies; it has kept its ecosystem, largely intact. Most of the shore is yet undeveloped, and more than a third of the “central ecologic zone” around the lake is in protected status. There is currently only one industrial plant discharging emissions directly into the lake, as well as several small municipalities and associated light industries. The main water column remains unpolluted, though it is important to note that localized areas of pollution are observed in a number of areas close to shore (i.e. tourism areas, near Baikalsk Pulp and Paper Mill, Selenga Delta, etc.) and it is the littoral zone that contains the bulk of Baikal’s biodiversity.

The Baikal ecosystems face potential and current threats from a number of different sources including: air pollution from large industrial complexes in Baikal’s “zone of atmospheric influence”, especially from heavy industries in the Angara Valley west of the lake, mining (both in Mongolian and Russian parts of the watershed), unsustainable tourism, illegal and semi-legal land development on the shores, deforestation in the watershed, pollution from the Baikalsk Pulp and Paper Plant (BPPP), pollution carried by the Selenga river (including non-point sources, municipal waste from population centers including Ulan Ude, industry such as Selenginsk Pulp and Paper Mill), fishing, water level control related to electricity production, and potential large infrastructure projects.

A comprehensive look at these issues is beyond the scope of this work. Here we will focus on topics that we encountered during the ETOA that seem most urgent and that mirror issues that seem widespread nationwide.

STATE OF KNOWLEDGE

Information Access and Science

AVAILABILITY OF INFORMATION TO THE PUBLIC

There are some good internet resources for environmental information in the region. The federal Ministry of Natural Resources and Environment contracts and information portal and the production of yearly comprehensive reports on the state of Lake Baikal⁶⁶ and the Irkutsk Region’ does yearly reports on the environmental state of the region⁶⁷. Additionally, an independent news website (www.babr.ru) provides good coverage of news items on regional environmental issues. Environmental NGOs like the Baikal Environmental Wave have information on environmental campaigns and issues on their websites. While none of these information sources may provide the unbiased clearinghouse of information one might hope for, they are more than exist in many other locations.

LACK OF TRUSTWORTHY DATA

Lake Baikal is one of the most well studied ecosystems. Respected scientific institutes, such as the Limnology Institute and Institute of Geography located in Irkutsk and the Baikal Institute of Natural Resources in Ulan Ude, are doing vigorous research. There are also a large number of

⁶⁶ See <http://www.geol.irk.ru/baikal/baikal.htm> for yearly reports on the state of Lake Baikal, Baikal environmental legislation, environmental news, and more.

For example:

Government report “About the state of Lake Baikal and actions taken for its protection in 2008.”

(Государственный доклад «О состоянии озера Байкал и мерах по его охране в 2008 Году»). Irkutsk: Siberian branch of federal science organization “Rosgeofond”, 2008.

⁶⁷ See <http://ecology.irkobl.ru/sites/ecology/working/ohrana/>

other Academy of Science institutes in the area; however, many of them have seen funding levels drop significantly over the years. Despite the existence of strong research institutions, it is difficult to get trustworthy information on controversial topics⁶⁸. Even the best known scientific institutes are subject to political and economic pressures on particular issues. This creates dubious data in some cases, and lack of data, in others, as funding for certain topics is not maintained. Moreover, the government occasionally uses methods that decrease trust even further (such as replacing the members of an expert commission that come back with an unfavorable verdict as was the case with the environmental impact assessment of the proposed oil pipeline about four years ago). This results in a dearth of trustworthy information.

MONITORING

After extensive reorganizations of the institution responsible for environmental monitoring of Lake Baikal, much of the equipment (including ships) and expertise has been lost. Similar lack of trustworthy data is found in the cases of fish population dynamics, forest inventory, and other spheres. As for the monitoring of emissions, which relies heavily on self-reporting by companies, paper audits, and occasional inspections that are announced to the company in advance – the resulting data is trusted by no one. This seems to be the case in all parts of Russia.

Protected areas

More than a third of the area (about 19,500 sq km) of Baikal's central ecological zone is protected. This includes three federal level zapovedniks (strict nature reserves- IUCN category Ia), 2 National Parks (IUCN category II), and six zakazniks (reserves- IUCN category IV). The funding for protected areas around Baikal, as in all of Russia, plummeted after the fall of the USSR, leading to a decrease in staff numbers and staff salaries and limiting capacity in both protection and scientific work of the protected areas. The survival of Russia's unique zapovednik system, however, was in itself an achievement. No other country in the world has such a vast system of strict reserves where entrance to even hikers is prohibited unless they are part of an educational or scientific group and accompanied by a guide. Traditionally, tourism (other than environmental education) played almost no role in the zapovednik system.

There is significant funding budgeted for tourism development of Russian Protected areas beginning in 2011. Some 800 million rubles per year, for the next three years have been budgeted for development of "educational ecological tourism" in zapovedniks. This budget included significant funds for seven model zapovedniks, two of which are around Baikal. Baikal'skiy Zapovednik is set to receive an additional 60 million rubles to be used for tourism and Baikalo-Lenskiy Zapovednik's funding is to be quintupled in relation to 2010 to 115 million rubles. Meanwhile, Pribaikalsky National Park (though not part of the scheme for tourism development of zapovedniks) is set to have its budget quadrupled to 125 million rubles.⁶⁹

This decision represents both an opportunity and a threat. On the positive side, there is hope that these developments will address the woeful underfunding of protected areas, which has affected function and the ability to hire and retain qualified staff. Additionally, the role of protected areas in interpretation and ecotourism, traditionally of low priority, given the historic

⁶⁸ Some examples of these kinds of topics where reliable information is difficult to obtain that we encountered during our one week in the region: various issues associated with BPPP, the death of stands of fir trees with symptoms resembling those of acid rain, disappearance of crustacean *gamarus* in the Selenga Delta.

⁶⁹ "Two zakazniks in Irkutsk Oblast' will be transferred to the management of a zapovednik and a National Park." RIA-News. Available at: <http://news.babr.ru/?IDE=90074>

role of zapovedniks as primarily conservation and research institutions, and the fairly recent creation of national parks, will receive a welcome boost.

There is also considerable danger, especially if we consider a couple of parallel developments: 1) The requirement of reporting on profitability of tourism and tying of director salaries to profits; and 2) A bill in the Duma (reviewed by the ETOA Team) to fundamentally amend the legislation on protected areas, which would considerably weaken the current regime (allowing the building of infrastructure, such as hotels and children's camps, in zapovedniks, transfer of zapovedniks to national parks, removal of land from national parks for other uses, etc.). The threat is that pressure for protected areas to pay for themselves through profits would lead in some cases to tourism development of a sort fundamentally opposed to their primary missions.

The issues with Pribaikalsky National Park (PNP) are, if anything, even more complicated. Unlike most of the other protected areas around Baikal, PNP is quite accessible by road along most of its area. PNP is also especially attractive to tourists due to the warm water beaches created by the shelter of Olhon Island. Additionally, PNP contains land that is under dual jurisdiction with the local government and land that has not been removed from private agricultural use, and land claimed by indigenous groups. This has resulted in a situation of unsustainable tourism that violates current zoning laws of the national park, as well as, various attempts at land grabs driven by large economic interests. Planned, sustainable tourism development is a priority for PNP.

Baikalsk Pulp and Paper Plant

The Baikalsk Pulp and Paper Plant (BPPP) is the only large industrial enterprise discharging emissions directly into Lake Baikal⁷⁰. It has spawned environmental protests and unfulfilled promises since plans for its building became public in 1958. In 2008 the BPPP, unable to meet economic and technical demands associated with the switch to a closed cycle of water circulation, was shut down creating a desperate socio-economic situation in the town of Baikalsk. An amendment of the Law of Baikal to allow activities previously forbidden in the Central Ecologic Zone (such as pulp production and disposal of waste through burning or burying) was required for BPPP to reopen. As one might expect, this amendment of the Baikal Law might have repercussions that extend beyond those pertaining to BPPP. Currently the plant is operating at diminished capacity. This is due both to technical issues related to the difficulty of re-starting a plant of this sort after a shut-down, as well as, economic demand for cellulose. BPPP currently has only about half the employees it employed before the shut-down, and the employees receive salaries that are about half the previous level.

Current information is that the plant will close in 2015. Given the historic record of unfulfilled promises of this sort, it is hard to say how realistic this date is. Some factors that might support this are that the plant is working at a loss and that its outdated infrastructure might simply not be capable of holding out very much longer. Additionally, there seem to be investments from both the government⁷¹ and private sectors being made for alternative economic enterprises.

Two new promising developments the Team heard were:

1) Baikalsk will be part of the special economic zone of the tourism type that has been awarded to Irkutsk Oblast'. These zones imply a lot of federal and regional investment into tourism infrastructure. Originally the Irkutsk Oblast' special economic zone was slated for a very

⁷⁰ Small enterprises, rail yards and urban developments around the southern part of the lake must also be making a contribution to its pollution.

⁷¹ Much money is promised to Baikalsk under the 'monocity' (company town) support program.

different area and populated areas were not eligible under the special tourism zone framework. It appears an exception has been made in this case.

2) The federal government has promised to provide funding for remediation of accumulated industrial waste, to be implemented by the BPPP. Though this represents the provision of government money to pay for a liability the company should in fairness meet, this is the only alternative available for remediation to actually occur. If it does indeed occur, it would be a positive development. Of course it would be better if the same people who were repeatedly responsible for environmental violations over many years were not in charge of the remediation process.

3) The municipality of Baikalsk seems to be energetically planning for a post-industrial future, with promotional literature, a summer festival and support to a ski resort.

Even if the BPPP is indeed shut down by 2015 a number of points of concern remain:

- *Risk of accident prior to shutdown*
- *Ensuring a safe shutdown and disposal of reagents*
- *Remediation of accumulated industrial waste*
- *Alternative employment for the town*
- *Infrastructure for the town—especially a new Heat and Power Plant*

Forestry

Irkutsk Oblast', with 69.4 million hectares of forest fund land, is one of Russia's large forested regions.⁷² In this, as in other regions, it was apparent that forest management capabilities have suffered considerably under the new Forest Code. However, Irkutsk seems to have kept some functions intact more than other areas. For example, the Irkutsk Oblast' is one of the few places where a functioning aerial fire control system still exists. Also, the Team heard about some innovative approaches, such as a law passed about a month ago attempting to decrease forest theft through the creation of central points of collection, loading/transport, and processing of timber. The Irkutsk Oblast' Forest Agency was open to possible cooperation with US Forest Service in the future.

EFFORTS TO ADDRESS THE ISSUE

Management of Lake Baikal Basin

Special legislation has been passed for Lake Baikal, of which the Baikal Law is only one major example. However, that legislation often bore a declarative or framework character. Moreover, once enforcement mechanisms were put into place, they were often weakened when they came in conflict with economic interests. One recent example of this is the List of Prohibited Activities in the Central Ecological Zone. This list, put into effect in 2002, remained toothless until the boundaries for the ecological zones were finally set in 2006. However, in the time since 2006, amendments and exceptions have already been added that allow construction of large infrastructure projects in the central ecologic zone (for the Buryat Special Economic Zone of the Tourism Type) and do away with the prohibition for cellulose production with emissions into

⁷² A very small part of this land falls within the Lake Baikal watershed; Buryatia Region contains a much larger portion. However, we present the case of Irkutsk here, as an example of a heavily forested region with well developed timber industry, which has retained more of its forest management capacity than many others.

Baikal, as well as, altering the prohibitions regarding solid waste disposal (in order to allow the legal functioning of BPPP).

Various land-use planning efforts, starting with the USAID funded Davis plan in 1991-1996 have been developed, without being implemented.

Likewise various coordinating agencies have been developed over the years. From 1993 to 2000 the Baikal Commission was charged with bringing together stakeholders from various federal and regional agencies to coordinate environmental protection of Baikal. It ceased to exist with the incorporation of the State Committee of Ecology into the Ministry of Natural Resources. It was followed by Baikalpriroda, charged with a similar function, and likewise being lost in another bout of restructuring. Currently the Inter-agency commission in Moscow, chaired by the Minister of Natural Resources is supposed to have the coordinating and policy forming function. The commission meets only about once or twice a year, and does not seem to have permanent staff. None of the above mentioned agencies had enough authority for creation and implementation of basin-wide policy. However, the previous agencies were at least able to have a coordinating function and produce such legislation as the Baikal Law. The current Inter-agency commission does not serve this role.

Past Large International Efforts

- GEF Project – 1996-2003. \$7 million was allocated for the Baikal component of the \$20.1 million GEF/World Bank Biodiversity Conservation Project in Russia. The small grants part of the component was seen as most successful.⁷³ On its completion, the World Bank rated the project as Successful and its sustainability as Likely. While the inconsistency of government support since then does raise some questions on sustainability, several lasting impacts of the project can be seen, not least the energy level of a number of NGOs working on Lake Baikal issues.
- GTZ's land use planning program and EU/TACIS studies on watershed management, pulp industry, and forests completed around the same time.⁷⁴

Civil Society

There was an expansion of NGO groups in the 1990's and early 2000s due partly to an inflow of foreign funding. In recent years, however, that funding has dried up leaving many NGOs in dire straits, further exacerbated by the global economic crisis. It is interesting to note, that the region in Russia possibly best known for environmental campaigns has only two well-known regional advocacy NGOs, with about 2-3 full time program staff each. Moreover, most of that staff is at or near retirement age.

Previous USAID support

Through its partnership with the US Forest Service, USAID has been supporting regional NGOs (Great Baikal Trail and Tahoe Baikal Institute) that deal with environmental education, leadership building, and ecotourism, rather than advocacy. These NGOs have good relationships and even partnerships with city and regional government organs, and with

⁷³ Brunello, Anthony J. et al. "Lake Baikal Watershed : Lake Basin Management Experience Brief." Prepared for the GEF Lake Basin Management Initiative. 2004. Available at: <http://www.ilec.or.jp/eg/lbmi/reports/02_Lake_Baikal_27February2006.pdf>

⁷⁴ Brunello, Anthony J. et al. "Lake Baikal Watershed : Lake Basin Management Experience Brief." Prepared for the GEF Lake Basin Management Initiative. 2004. Available at: <http://www.ilec.or.jp/eg/lbmi/reports/02_Lake_Baikal_27February2006.pdf>

protected areas. Their years of work with youth have resulted in alumni of the organizations in many environmentally related positions in academia, regional government, and NGOs.

These NGOs provide services (such as trail building and interpretive materials for protected areas, environmental education in village schools and during public events, training educators in environmental education methods, etc.) that complement the needs of government agencies and, with very little resources, can serve as catalysts to increase activity and capacity in particular thematic areas.

On the Horizon

A multi-part GEF/UNDP project on *“Integrated Natural Resources Management in the Baikal Basin Transboundary Ecosystem”* has been planned but is not yet being implemented.

The Russian federal government has announced a new program titled *“Protection of Lake Baikal and socio-economic development of Baikal natural territory in 2011-2020.”* One billion rubles has already been budgeted for 2011 under this program. More than 70 billion rubles are planned to be spent on the program before 2020.⁷⁵

ACTIONS NEEDED AND SCOPE FOR USAID INVOLVEMENT

Necessary Actions

- Mechanisms for independent scientific research and analysis in controversial environmental topics;
- Creating mechanisms to promote sustainable tourism in protected areas and around Baikal as a whole;
- Increase in environmental awareness, ethic, and active participation;
- Continued capacity building for regional environmental NGO's including strategic development and sustainable funding opportunities;
- BPPP: alternative economic development, responsible plant closure, remediation of industrial solid waste sites, new power and heating plant for Baikalsk;
- Technical cooperation on forestry issues;
- Coordination of environmental protection institutions.

Continuation of currently funded USAID efforts

- Build on work to promote ecotourism through building trails, interpretive displays, and providing access to information that makes ecotourism routes more accessible. Use this to support educational and ecotourism components of impending tourism development program for protected areas.
- Build on environmental education workshops by providing trained educators with adapted and translated materials and continued support. Facilitate creation of permanent environmental education program in protected areas and regional schools.
- Continue to support volunteerism and environmental involvement among local youth.

⁷⁵ “The government will budget 1 billion rubles in 2011 for the environment of Baikal.” RIA-News. Available at: <http://eco.rian.ru/business/20101223/312483712.html>

Expanding current USAID efforts

- Build on previous ecotourism work with GBT to establish relationships with protected areas through which methodology on sustainable tourism development can be shared.
- Connect existing environmental educators through permanent information networks like a web forum. Expand environmental education outreach to Buryatia. Connect environmental educators in the Baikal region to those in other regions.
- Establish a technical cooperation partnership with Irkutsk Forestry Agency. Topics can include fire, illegal logging, silvicultural methods, etc.

Other opportunities for USAID funding in the region:

- Complementing UNDP program components once more information on them becomes available.
- Sharing mechanisms for developing alternative economic opportunities and tourism development in Baikalsk
- Scientific partnerships and provision of independent scientific expert opinion on selected subjects

Map (see below)



CASE 7 AMUR TIGER CONSERVATION

NATURE OF THE ISSUE

The Amur tiger (*Panthera tigris altaica*) is the world's northernmost subspecies of tiger out of nine. Approximately 95 percent of the entire Amur tiger population lives within the RFE. Its abundance estimate varied from 3,000 individuals in late 19th Century to 40-50 in the 1950s, and then up again to 400-500 in the early 2000s.⁷⁶ Thanks to measures taken during the second half of the 20th Century, particularly from 1993 to 2003, the population is now relatively stable.⁷⁷ Serious threats to survival of this subspecies continue due to habitat degradation, poaching and the illegal trade in tiger parts and derivatives. As a top predator, the tiger is a key element of forests of the southern part of the RFE, and can serve as an indicator, or umbrella species, for biodiversity conservation in the region. Conserving viable populations of the Amur tiger can occur only by preserving its natural habitats. This is directly linked to the conservation of natural forest ecosystems, which host up to 80 percent of Russia's biodiversity among some taxa.⁷⁸

STATE OF KNOWLEDGE

The range of the Amur tiger in Russia extended up to the 50-51°N. Intensive and unregulated hunting resulted in a decline in the total population from the early-19th Century to the late-1930s. This was accompanied by fragmentation of its range. In the 1940s, the distribution of the tiger within the Sikhote-Alin, its main habitat, became fragmented. In 1947, a blanket ban on the hunting of the Amur tiger was introduced. It succeeded in halting the long decline in numbers of tigers and stabilizing the population. Isolated population groups have gradually started re-colonizing suitable available habitats, but the distribution of the tiger remains scattered. From the mid-1960s until the mid-1980s, population numbers increased steadily in all areas south of the Amur River. From the mid-1980s until the early-1990s in the northern Sikhote-Alin, tigers settled within habitats in which they either didn't exist before, or were rarely seen. The re-colonization by tigers over the larger part of their range has remained relatively stable. The results of the censuses conducted in 1996 and 2005 showed that tigers occurred within all of the forested area within its range (Figure 1). The largest part of the tiger's range in Sikhote-Alin recovered its contiguity and it is no longer fragmented.

⁷⁶ Miquelle, D.J., Pikunov, D.G., Dunishenko, Y.M., etc. 2007. Amur tiger census // Cat News. #46. P. 14-16.

⁷⁷ Zhuravlev, Yu.N., 2010. History of Amur tiger research, 1996-2009 // Zhuravlev, Yu.N. (ed), The Amur Tiger in Northwest Asia: Planning for the 21st Century. Proceedings of the Int'l Conference, March 15-18, 2010, Vladivostok, Russia. Vladivostok, Dalnauka Publ. P.7-20.

⁷⁸ Lelej, A.S.(ed), 1995-2006. Identification Keys for Insects of the Russian Far East. In 6 volumes. St. Petersburg: Nauka Publ. (In Russian).



Figure 1. Distribution of the Amur tiger in Russia according to the 2005 Census.⁷⁹

EFFORTS TO DATE TO ADDRESS THE ISSUE

The need to protect the Amur tiger in the Russian Far East is recognized in current legislation. In 1947, a blanket ban on the hunting of the Amur tiger was introduced, and since 1955 no capture of tiger cubs has been allowed.

The Amur tiger is listed in the Red Data Book of the Russian Federation and IUCN, and protected due to Russia's participation in international conventions: Convention on Biological Diversity, CBD, and Convention on International Trade in Endangered Species, CITES.

Its protection is enshrined within a number of laws:

- Federal Law on Environmental Protection
- Federal Law on Wildlife
- Federal Law on Specially Protected Natural Areas
- Decree of the Government of the Russian Federation "On the Conservation of the Amur Tiger and Other Rare and Endangered Wildlife Species within Primorsky and Khabarovsk Krai", # 795 of August 7, 1995
- Conservation Strategy for Rare and Endangered Species of Animals, Plants and Fungi, accepted by the Ministry of Natural Resources # 323 of April 6, 2004

⁷⁹ Rozhnov, V.V. (ed.), 2010. Strategy for Conservation of the Amur Tiger in the Russian Federation. Moscow, Ministry of Natural Resources and Environment of the Russian Federation. 88 pp.

- Conservation Strategy of Amur Tiger for Russia, approved by the Ministry of Environmental Protection and Natural Resources on June 24, 1996.

These measures have led to a more stable number of animals, and a gradual expansion of the range, as compared to the situation in the 1990s. Offsetting this, relatively flat areas with scarce forest cover were developed for agriculture and have been lost from the tiger's range. The loss of cover between Sikhote-Alin and the Eastern Manchurian mountains have resulted in habitats becoming separated from one another. Extensive logging practices have created abundant access into the tiger's range due to the forest road building and perhaps represent the most serious threat to tigers. This – coupled with the deteriorating socioeconomic situation within Russia and the loss of employment opportunities, especially in more remote villages – has meant a greater reliance on game species, resulting in more competition for tiger prey species of wild boar and sika deer in areas that were previously inaccessible and once the sole domain of the tigers.

Recent measures are intended to begin addressing these important threats. Some include:

- Strategy for Conservation of the Amur Tiger in the Russian Federation, approved by the Ministry of Natural Resources and Environment of the Russian Federation #25 of July 2, 2010.
- New edition of Decree of Ministry of Agriculture of the Russian Federation “List of species (sorts) of trees and bushes prohibited for timber logging”, of August 2, 2010, which included Korean Pine, the umbrella species for tiger habitats.
- International “Tiger Summit” took place in St. Petersburg, November 21-24, 2010.
- Attention paid to the Amur Tiger appears beneficial to the Amur leopard (*Panthera pardus orientalis*), an even more endangered species (and also on the CITES list). There are plans^{80 81} being implemented for creating a National Park at Southern Primorye with an area of 384,000 ha. The National Park “Land of Leopard” will protect the Amur Tiger too.
- Rehabilitation Centre for Wildlife under Special Inspection “Tiger” of the Ministry of Natural Resources and Environment opens in Razdolnaya, Primorsky Krai. Together with an operating (private) rehabilitation center “Utes” in Khabarovsk Krai, they cover the needs for tiger rehabilitation.
- USAID recently provided a \$400,000 grant⁸² (mainly for monitoring) for the Amur tiger in the RFE.

ACTIONS NEEDED AND SCOPE FOR POSSIBLE USAID INVOLVEMENT

In the updated version of the tiger conservation strategy^{iv}, special attention is paid to the following issues which help to highlight where specific actions are needed:

- Reducing the degradation of Amur tiger habitat by introducing best practices and improving forest and wildlife management;
- Strengthening civil and criminal penalties for poaching and the illegal possession of and trade in Amur tiger parts;
- Providing incentives to encourage small businesses within local communities that support tiger conservation;
- Improving international population monitoring for the Amur tiger;

⁸⁰ Khokhlov, S. 2010. Personal communication. Director, Kedrovaya Pad Zapovednik.

⁸¹ Anonymous. 2010. Leopard Reserve Proposed. *Moscow Times*. 13 December 2010.

⁸² http://russia.usaid.gov/publications/news/20101123/Tigers_Grant/

- Obtaining trans-boundary agreements with China (National Parks and other adjacent protected areas).

Possible areas for USAID involvement:

- Some local people still recognize tigers as threatening, or harmful, animals. For this target group, more environmental education is needed. This could also be linked to a rural development program because most of local poachers hunt for tigers out of a livelihood need due to lack of jobs in their villages;
- Continued and augmented support for NGOs monitoring the tiger population;
- Improving research on tigers, especially in health, due to known outbreaks of various diseases (i.e., distemper, mycosis) in the region.

ANNEX F: MAPS

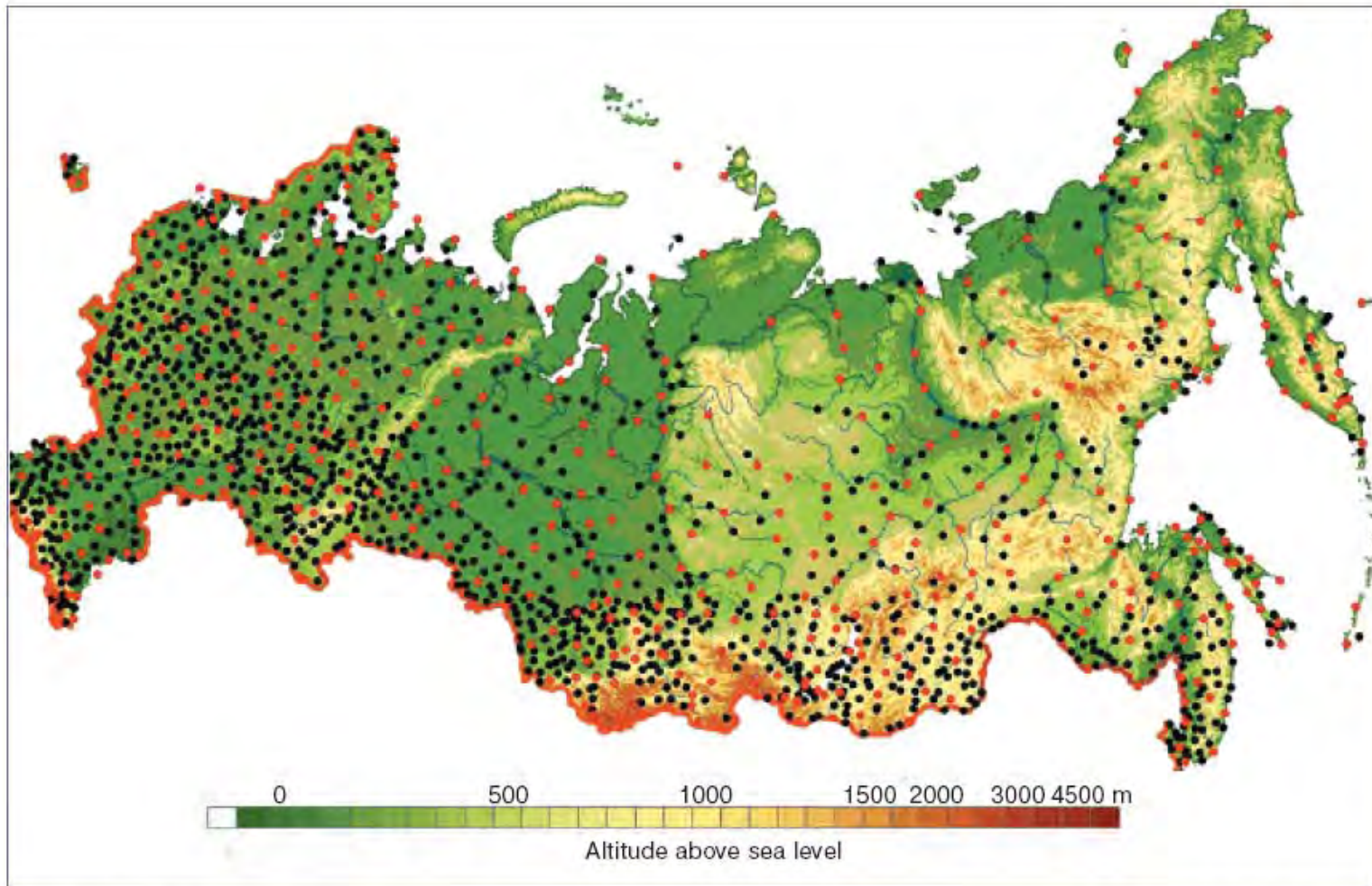


Fig. GS1. Basic surface meteorological network of the Russian Hydrometeorological Service that consists of 1627 stations including 458 reference stations (red circles).

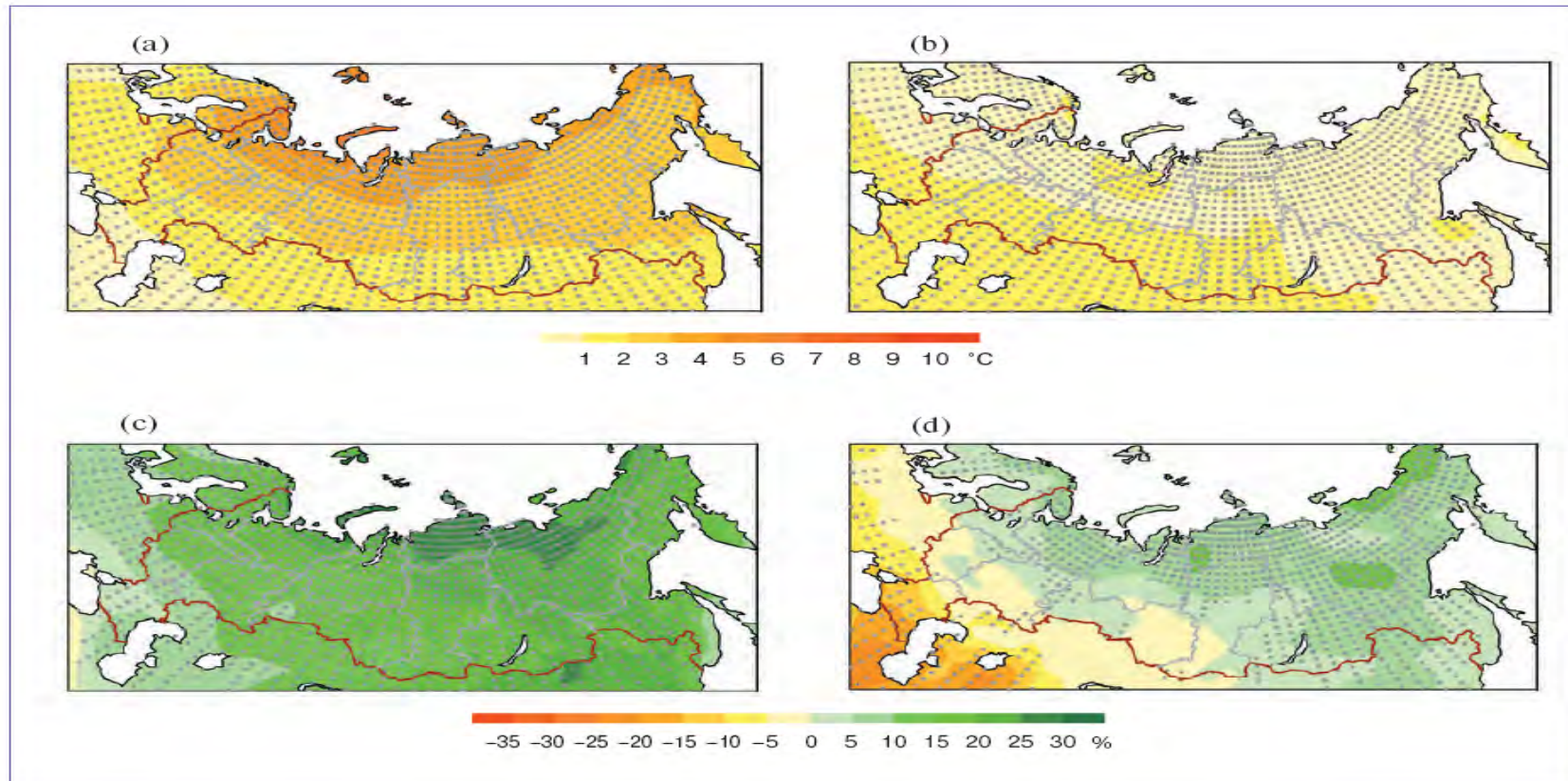


Fig. GS7. Changes in surface air temperature (a, b) and total (solid and liquid) precipitation (c, d) in Russia and adjoining regions for winter (a, c) and for summer (b, d) during the period 2041–2060, as compared to the period 1980–1999. Assessment was obtained from the ensemble of 16 CMIP3 AOGCMs using scenario A2. Temperature is given in degrees Celsius and precipitation in percent relative to its value in the corresponding season for the period 1980–1999. In the upper panels (a, b) dots imply that mean temperature changes exceed the standard deviation of the inter-model scatter (signal is larger than noise), and in the low panels (c, d) they denote the areas where two thirds of the models show changes of the same sign (AR, vol. 1, Figs. 7.7, 7.14).

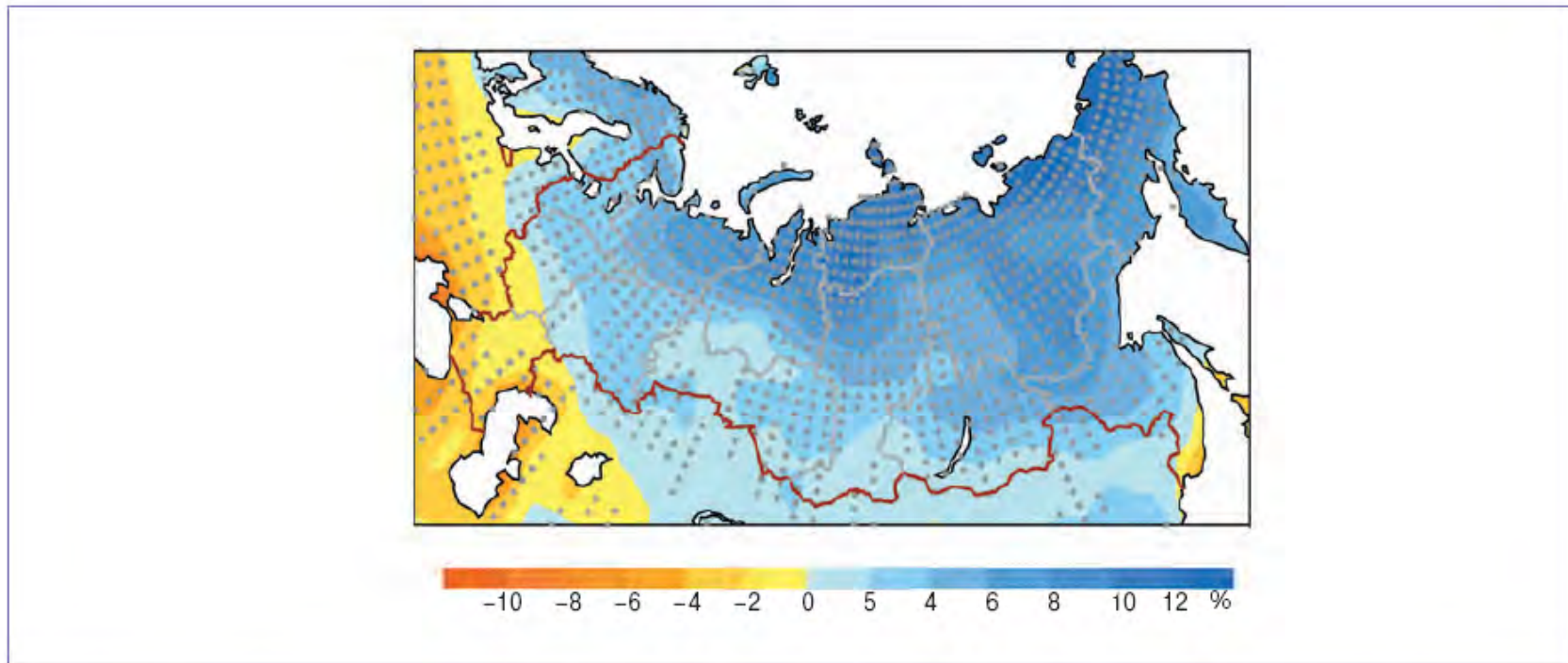


Fig. GS8. Changes in annual runoff for the middle of the 21st century (2041–2060) derived from the ensemble of 16 CMIP3 AOGCMs for the SRES A2 scenario. Values are given in percent relative to the reference period. Dots denote areas in which two thirds of the models show changes of the same sign.

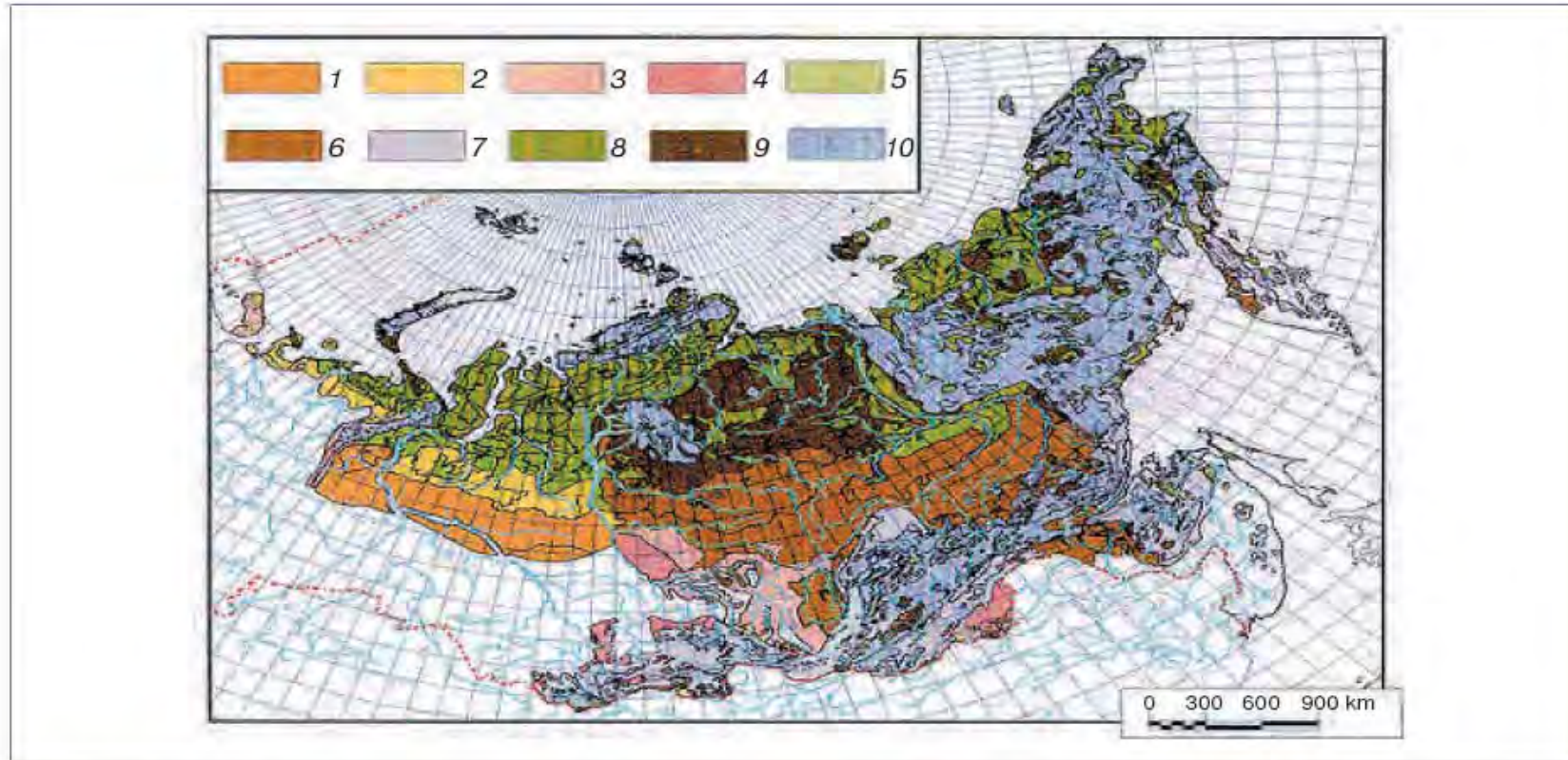
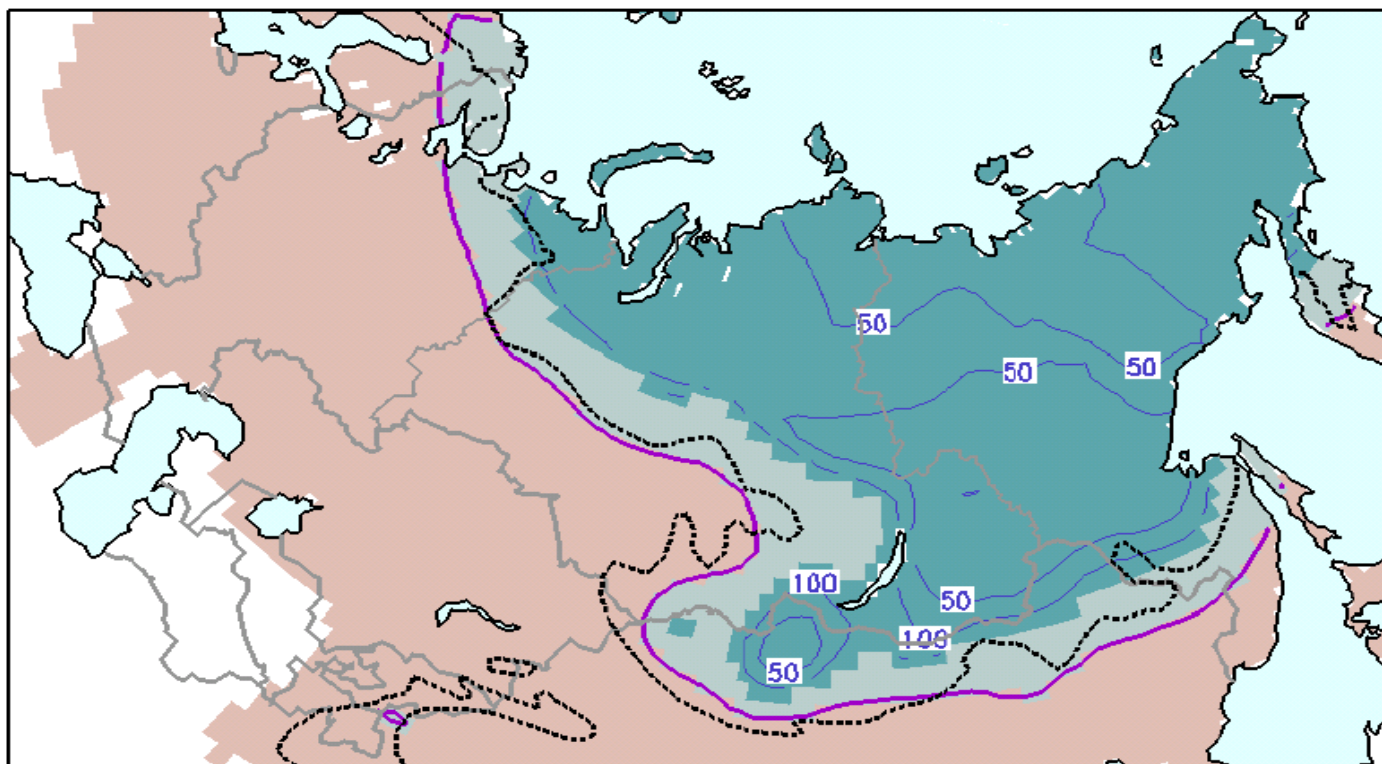


Fig. GS10. Possible changes in permafrost over the territory of Russia by 2020 and 2050 due to climate change. (1) Thawing everywhere in plains by 2020; (2, 3, 4) thawing everywhere by 2050 in plains, plateaus, and mountains, respectively; (5, 6, 7) partial thawing by 2050 in plains, plateaus, and mountains, respectively; (8, 9, 10) relatively stable state in plains, plateaus, and mountains, respectively. Black lines within color domains indicate areas with a different character of permafrost changes under climate warming (AR, vol. II, Fig. 3.7.1).

MAP 4.2 SHIFTING BOUNDARIES AND DEGRADATION OF PERMAFROST BY MID-CENTURY

■ 1 ■ 2 ■ 3 — 4 - - - - 5

Source: Kattsov 2008. *Notes:* (1) seasonal thawing, (2) seasonal freezing, and (3) transition from the regime of seasonal thawing to that of seasonal freezing in the upper 3-meter layer. Contours show an increase of thawing depths (cm) relative to 1980-1999; (4) the simulated current boundary of permafrost defined as the position of zero-degree isotherm at the 3-meter depth; (5) an approximate observed current position of the permafrost boundary.

