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UKRAINE FAA119 BIODIVERSITY ANALYSIS: ACTIONS NEEDED FOR CONSERVATION

PROSPERITY, LIVELIHOODS AND CONSERVING
ECOSYSTEMS (PLACE) IQC
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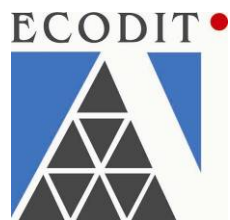
AUTHORITY

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Cover photo: *Nymphoides peltata*, Yellow Floating-heart, Dnipro Delta. This plant was common in rivers and floodplain lakes of the Dnipro River Basin when it had a natural hydrological regime. After the many Dnipro dams were constructed and completely altered the natural flow regime, this species became rare, and is now listed in the Red Data Book of Ukraine. Photo by G. Karpova (2009)

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ABBREVIATIONS AND ACRONYMS

We have tried to minimize the use of abbreviations and acronyms used in this report, but we use them to save space when they refer to frequently mentioned organizations and conventions, and when commonly used in this field. The full name to which the abbreviation or acronym refers is given the first time it is used in the text.

BEO	Bureau Environmental Officer
EE	Europe and Eurasia
CBD	Convention on Biological Diversity
CDCS	Country Development Cooperation Strategy
CITES	Convention on International Trade in Endangered Species
CMS	Convention on Migratory Species
CNPA	Carpathian Network of Protected Areas
ECNC	European Centre for Nature Conservation
EEZ	Exclusive Economic Zone
ENPI	European Neighborhood and Partnership Instrument
EU	European Union
EUNIS	European University Information Systems
FAA	Foreign Assistance Act
FLEG	Forest Law Enforcement and Governance
FSC	Forest Stewardship Council
GEF	Global Environmental Facility
GOU	Government of Ukraine
HCVF	High Conservation Value Forests
IBA	Important Bird Area
IPM	Integrated Pest Management
IUCN	International Union for the Conservation of Nature

MAB	Man and the Biosphere
MENR	Ministry of Ecology and Nature Resources
NECU	National Ecological Centre of Ukraine
NGO	Non-governmental Organization
NOBANIS	North European and Baltic Network on Invasive Alien Species
NTFP	Non-Timber Forest Product
PA	Protected Area
PDP	Parliamentary Development Project
PES	Payment for Ecosystem Services
SAFR	State Agency for Forest Resources
SFC	State Forestry Committee
SIDA	Swedish International Development Agency
SOW	Scope of Work
USAID	United States Agency for International Development
USFS	United States Forest Service
USGS	United States Geological Survey
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNITER	Ukraine National Initiatives to Enhance Reforms
USPB	Ukrainian Society for the Protection of Birds
WWF	World Wide Fund for Nature

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Many busy people from government, NGO, and donor programs willingly made time to talk to us and freely share their knowledge and opinions. The Biodiversity Analysis Team would like to express our deep appreciation to all of them, even though we cannot acknowledge each by name. Peter Luzik of USAID/Ukraine, COTR for this Analysis, gave us direction and supported our communication with the Mission, as did Tamara Palyvoda, Peter Duffy, and Margot Welk. USAID project managers and staff of the organizations implementing USAID projects helped us become familiar with USAID's work in Ukraine. Mr. Olexiy Vasiliuk of the National Ecological Center of Ukraine travelled with us to the steppe region of Donetsk and Lugansk Oblasts, and his knowledge of steppe biodiversity and contacts with local stakeholders were invaluable.

On our field site visits to the steppe region of eastern Ukraine, and the Polissya region, we were shown both successes and challenges first-hand, and we would especially like to thank local experts and stakeholders who assisted us. We wish to thank the director and staff of Donetskyi Kryazh Regional Landscape Park, Preval'skyi Steppe Nature Preserve, and Mizhrichenskyi Regional Landscape Park for their time and hospitality during these field visits. The Analysis Team received much information and heard many viewpoints from the people we met, and if in any way we have misunderstood them or misrepresented their views, the fault is ours. Despite the serious challenges we have identified to biodiversity conservation in Ukraine, the high level of knowledge, skills, and professional dedication we observed give us hope that these challenges will be met. We hope that in some small but significant way this report will lead to actions that will conserve the valuable and beautiful natural heritage and biological diversity in Ukraine, in support of its sustainable social, economic, and political development.

EXECUTIVE SUMMARY

USAID/Ukraine last conducted an FAA Section 119 Biodiversity Analyses in 2006 (report published in 2007). Since the last assessment, the political and economic situation in Ukraine has changed significantly. USAID/Ukraine is now developing a new Country Development Cooperation Strategy for its programs (2011-2016), and therefore requested ECODIT to undertake a new Biodiversity Analysis for Ukraine.

Information for this analysis came from review of relevant documents; interviews with representatives of key stakeholder groups, including national government agencies, international and national NGOs, international donors, USAID/Ukraine Mission and project staff; and site visits to the steppe biogeographic zone of eastern Ukraine, and the Polissya region of northern Ukraine.

This report includes an overview of the status of biodiversity in Ukraine and discusses the values and economics of biodiversity, relevant legal and institutional structures of the Government of Ukraine that affect biodiversity conservation, and NGO and donor programs. We used the “threats-based approach” that guides USAID’s biodiversity programming as the conceptual framework for our analysis. We first analyzed the principle direct threats to biodiversity in Ukraine, and their social, political and institutional, and economic causes. We then identified the actions needed to address, reduce, and/or remove the causes of biodiversity threats, thus meeting the first of the requirements of the FAA Section 119. The table below provides a summary of our analysis.

Report 2, to be completed following approval of Report 1 and a review of USAID/Ukraine’s current and planned portfolio of activities, will cover the second required component of an FAA 119 analysis by discussing the extent to which the actions proposed by USAID/Ukraine could contribute to meeting the actions needed identified in Report 1.

Ukraine faces serious challenges in conserving its diverse ecosystems and species. Some of our key findings and conclusions are:

- Biodiversity information is not adequate to easily assess trends in the status of ecosystem- or species-level biodiversity over the past decade.
- Land use maps are not publicly available in Ukraine at this time. Such maps are needed for assessing the status of biodiversity at the ecosystem level and effective biodiversity conservation planning, because they allow actual land use and cover to be compared with potential natural vegetation. Accurate maps showing the distributions and ranges of plant and animal species in the Red Data Books do not exist.
- Forest-steppe and steppe ecosystems are probably the least conserved and most threatened ecosystems in Ukraine at this time.
- Social causes of threats to biodiversity have not changed much over the past decade, in part because the management objectives of the PA system in Ukraine fail to build public interest and a committed constituency for biodiversity conservation, and in part, because of a lack of biodiversity information and education aimed at adults.

- Political and institutional causes of threats to biodiversity have not changed much over the past decade. Sectoral policies of the economy involving water management, farming, forestry, and fisheries barely take biodiversity conservation into account. Recent government restructuring has in some cases decreased the number and authority of staff to carry out mandated responsibilities relevant to biodiversity conservation. Mechanisms for public participation in national environmental decision making are still weak. One hopeful change is that the skills and experience of NGOs dealing with biodiversity conservation are improving.
- Economic causes of threats to biodiversity have generally become worse in the last five years. The economic crisis has led to further pressure for the unsustainable exploitation of forest resources. Global economic forces are leading to the expansion of large-scale commercial agriculture, adding to pressure for steppe conversion. The economic value of ecosystem services has not been widely recognized. The expansion of the protected area system in a period of economic stagnation has placed further demands on the already underfunded system.
- Regional Landscape Parks, managed at the oblast level with input from local councils, and Zakazniks, administered through regional offices of the MENR and managed by local councils and land users, play an important role in biodiversity conservation in Ukraine.
- Although Ukraine is party to the Ramsar Convention, in many cases the country's 33 registered Ramsar sites are not included in the national PA system, and some do not have any protected status. This is an obvious gap in compliance with an international treaty to which Ukraine is a party.
- NGOs focused on biodiversity conservation are very limited in number and operate with meager human and financial resources.
- Innovative actions to address some of the biodiversity conservation needs in Ukraine are taking place, providing potential models for replication, and scaling up.

In conducting this Biodiversity Analysis for USAID/Ukraine, the Analysis Team held discussions with many people representing a wide range of viewpoints and interests. The high level of knowledge, skills, and professional dedication we observed in this process gives us hope that these challenges will be met. We found that innovative and important steps are already being taken to meet many of these conservation challenges. We will discuss some of these innovative actions in Section 7.2, and in Report 2. We hope that in some small but significant way this report will lead to actions that will conserve the valuable and beautiful natural heritage and biological diversity in Ukraine, in support of its sustainable social, economic, and political development.

Ukraine Biodiversity Analysis Summary Table

Ecosystem	Threats	Causes	Actions Needed
Forest	Loss and fragmentation of remaining mature, diverse natural forests from forestry management practices (legal logging) and illegal logging	<u>Social</u> <ul style="list-style-type: none"> • Lack of public awareness and knowledge about biodiversity and its value; • Lack of public interest in biodiversity conservation • Lack of motivated constituency to advocate for biodiversity conservation 	<u>Social</u> <ul style="list-style-type: none"> • NGOs, the media, and government agencies at all levels need to engage in increased media coverage and social marketing campaigns to increase awareness and knowledge of threats to biodiversity and the values and benefits of biodiversity among the general public and government officials. • NGOs, the media, and government agencies at all levels need to develop educational materials in a diverse range of media (popular books, textbooks, radio, TV, film, internet media, magazines, newspapers) to increase awareness and knowledge of the diversity of values and benefits of biodiversity (products, ecosystem services, and non-material benefits) and about threats to biodiversity and the need and methods for its conservation. • NGOs and government agencies at all levels need to develop a public constituency for protected areas and biodiversity conservation through greater opportunities for outdoor, nature-based education, sustainable tourism and recreation. <u>Political/institutional</u> <ul style="list-style-type: none"> • International and national NGOs and/or international donors should develop and implement training programs to strengthen capacity of NGOs that focus on biodiversity conservation in areas such as organizational development; fundraising and financial management; and outreach, communications, and advocacy. • GOU needs to provide adequate staff and resources to MENR agencies, and the Academy of Sciences, to effectively
Forest-Steppe	Loss and fragmentation through conversion to agriculture, tree planting (afforestation) for shelterbelts, and illegal logging	<u>Political/institutional</u> <ul style="list-style-type: none"> • Forestry policies and practices that do not adequately recognize biodiversity and its value • Agricultural policies that do not adequately recognize biodiversity and its value 	
Steppe	Loss and fragmentation of remaining natural steppe through conversion to agriculture or through tree planting (afforestation) for shelterbelts; degradation through overgrazing and illegal mining	<ul style="list-style-type: none"> • Water policies do not adequately recognize the value of wetlands and freshwater biodiversity • Inadequate capacity (staff, training, and resources) in relevant agencies to carry out mandated responsibilities for conservation administration, management, and enforcement 	

Ecosystem	Threats	Causes	Actions Needed
Carpathian Mountains	Loss and degradation of forests from forestry management practices	<ul style="list-style-type: none"> • Inadequate mechanisms for public participation in national environmental decisions • A relatively weak biodiversity conservation NGO sector 	<p>carry out the responsibilities for biodiversity monitoring, management, conservation, and enforcement with which they are charged by national law, and by Ukraine’s participation in international treaties (CBD, CITES, the Bonn Convention, etc.).</p>
Crimean Mountains	Loss and fragmentation of habitat from infrastructure development, human-caused fire, and overharvesting of selected species	<ul style="list-style-type: none"> • Scientific institutions are weak in the applied, multidisciplinary, “conservation biology” perspective; • Educational institutions are generally oriented toward preparing students for disciplinary careers in biological science or forestry; interdisciplinary training for conservation that blends biological and social sciences is lacking. 	<ul style="list-style-type: none"> • GOU and NGOs need to conduct a national assessment of the impact and threat of climate change to the biodiversity of Ukraine, which at present is completely lacking • GOU needs to develop and implement a comprehensive policy and legislation regarding non-native invasive species • GOU needs to reform forest policy, law, and forestry practices to recognize the value of forest biodiversity and conserve it • GOU needs to reform agricultural policy, law, and practices to recognize the value of biodiversity and conserve it; this is especially critical in steppe and forest-steppe zones • GOU needs to reform water and marine policy, law, and practices to recognize the value of biodiversity and conserve it

Ecosystem	Threats	Causes	Actions Needed
<p>Freshwater Ecosystems and Wetlands</p>	<p>Loss and fragmentation through drainage and conversion to agriculture and infrastructure (houses, roads, industries, recreational sites), mining of granite and sand, and extraction of peat from bogs; degradation from agricultural, urban, and industrial pollution; habitat and species loss from dams and altered flow regimes of rivers; non-native species</p>	<p><u>Economic</u></p> <ul style="list-style-type: none"> • Lack of economic opportunities for local people because of the proximity of protected areas (such as nature-based tourism/ecotourism, income generation from harvesting of NTFPs, local Payments for Ecosystem Services schemes) • Lack of economic incentives and disincentives in the forestry sector for ecologically-sustainable forest management (such as price-premiums for certified timber, enforcement and collection of fines for illegal logging) • Lack of economic incentives and disincentives for conservation of steppe vegetation (such as conservation bank programs, enforcement and collection of fines for illegal grazing or mining) 	<ul style="list-style-type: none"> • GOU needs to develop mechanisms for increased public participation in environmental planning and decision making; NGOs need to advocate for such mechanisms • GOU needs to make more environmental and biodiversity information that it holds available to NGOs and the public, especially now in electronic form and accessible online • GOU needs legislation to protect endangered species outside of protected areas • NGOs need to develop a national network or coalition/clearinghouse of NGOs focused on biodiversity conservation • GOU agencies and/or regional governments need to develop sustainable management plans for the harvesting/hunting/fishing of commercially and/or recreationally valuable species and enforce hunting and fishing laws • National or regional government energy policies or laws concerning or promoting unconventional (e.g. shale gas) or renewable (e.g., wind, hydro, solar, biomass) energy sources need biodiversity safeguards
<p>Coastal Wetlands</p>	<p>Loss and degradation from infrastructure (housing, roads); loss of species from over-hunting; degradation from agricultural and industrial pollution</p>	<ul style="list-style-type: none"> • Lack of economic incentives and disincentives for conservation of wetlands and fisheries and other freshwater and marine biodiversity 	<p><u>Economic</u></p> <ul style="list-style-type: none"> • National and local governments, NGOs, and the private sector need to develop and implement programs to promote sustainable nature-based tourism and recreation (“ecotourism”) in and around protected areas of diverse types • National and local governments, NGOs, and the private sector need to develop and implement programs to promote sustainable harvesting of medicinal plants, NTFPs, and fish; link with increased economic opportunities and competitiveness within European and global markets

Ecosystem	Threats	Causes	Actions Needed
<p>Marine Ecosystems</p>	<p>Degradation from introduced non-native invasive species; degradation from agricultural and industrial pollution; loss of species through overfishing and destructive fishing practices</p>	<ul style="list-style-type: none"> • Lack of knowledge of the economic value of ecosystem services • Lack of a strategy and mechanism for sustainable financing of the protected area system, and in particular for its dramatic proposed expansion into a National Ecological Network by 2020. 	<ul style="list-style-type: none"> • National and regional governments need to develop and implement programs of economic incentives and disincentives for conservation of steppe vegetation • SAFR and NGOs, supported by donors and public-private partnerships, need to continue to promote forest certification increased economic competitiveness in EU and global markets; strengthen public-private partnerships to promote sustainable forestry • National, regional, and local governments, and NGOs, need to conduct studies of the economic value and potential of ecosystem services (such as hydrological/watershed services, nutrient cycling, carbon sequestration, natural pest control, pollination) at the national and oblast/regional level for use in planning and decision-making. • Government of Ukraine and regional governments need to continue the development of strategies and plans for adequate and sustainable financing of biodiversity conservation

I.0 INTRODUCTION

I.1 PURPOSE

The Foreign Assistance Act (FAA), which authorizes US bilateral foreign aid programs, requires that a Biodiversity Analysis be conducted in conjunction with the development of new foreign assistance strategies and programs. The purposes of this legal requirement are: 1) to provide a summary for USAID of the “actions needed” for conserving the biodiversity of the host country; 2) to inform the development of USAID assistance strategies and programs by identifying ways in which the host country could be supported to conserve its biodiversity; and 3) to assure that US foreign aid does not support activities that harm the biodiversity of host countries. This requirement is predicated on the view that biological diversity provides the foundation for long-term, sustainable social and economic development in any country, and therefore must be conserved.

Specifically, FAA Section 119 states 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 the actions proposed for support by the Agency meet the needs thus identified.”

USAID/Ukraine conducted two previous Biodiversity Analyses, one in 2001 and another in 2006 (report published in 2007). Since the last assessment, the political and economic situation in Ukraine has changed significantly. USAID/Ukraine is now developing a new Country Development Cooperation Strategy for its programs (2011-1016), and therefore requested ECODIT to update the Biodiversity Analysis for Ukraine.

The major objectives of this analysis were to:

- describe the status of Ukraine’s biological diversity;
- assess the adequacy and availability of information on biological diversity;
- describe the direct biophysical threats to Ukraine’s biodiversity and the causes of those threats;
- identify actions needed to reduce and/or mitigate the causes of those threats in the current political, economic, and social context; and
- recommend opportunities for USAID to support such needed actions within the proposed CDCS and programs it is planning.

In order to meet these objectives, this report provides all of the information requested in the Scope of Work (SOW)(*Annex C*) to the extent possible.

I.2 METHODS

Information needed to meet the above objectives was collected by a team of consultants contracted by ECODIT (see *Annex B*, Biographical Sketches of Team Members). The information-gathering and analysis process followed USAID guidance on a threats-based approach to biodiversity conservation described in *Biodiversity Conservation: A Guide for*

USAID Staff and Partners (USAID, 2005; http://pdf.usaid.gov/pdf_docs/PNADE258.pdf), and the “best practice” guidance provided in *Tropical Forestry and Biodiversity (FAA 118-119) Analyses: Lessons Learned and Best Practices from Recent USAID Experience* (USAID, 2005b; http://pdf.usaid.gov/pdf_docs/Pnade195.pdf)

Information was gathered from several sources. No single source by itself was sufficient, and information from one source was validated by, and supplemented with, information from other sources. The sources of information include the following:

- Review of relevant documents, including the two previous Ukraine FAA 119 analyses conducted in 2001 and 2006 (report published 2007); GOU strategies, plans, atlases, and data books; donor project documents; reports in the scientific literature; web-based documents and reports, etc.;
- Interviews with a sample of representatives of key stakeholder groups (see *Annex D*, Persons Contacted), including national government agencies, international and national NGOs, private sector representatives, and international donors (bilateral and multilateral), and USAID/Ukraine Mission staff; and
- Site visits to: 1) the steppe eco-region of eastern Ukraine, Donetsk and Lugansk Oblasts, to visit protected areas and unprotected sites of high conservation value and talk with a range of local managers and other stakeholders, and 2) the Polissya ecoregion of northern Ukraine to visit Mizhrichensky Regional Landscape Park, make ecological observations, and speak with the Park Director.

2.0 STATUS OF BIODIVERSITY

The modern concept of biological diversity, or “biodiversity” for short, encompasses the variety and variability of life at three levels of organization: ecosystems, species, and genes. This chapter will review the adequacy and availability of biodiversity information in Ukraine, review the status of Ukraine’s biodiversity at the ecosystem and species levels, and provide a brief discussion of genetic diversity.

2.1 BIODIVERSITY INFORMATION

Our SOW requests a general overview of information available on the status of biological diversity in Ukraine, sources of information and links to the most relevant web pages, and a discussion of possible information gaps.

At the ecosystem scale, the National Atlas of Ukraine (2008) <http://wdc.org.ua/atlas/en/4110200.html> provides information on large-scale ecoregions (Fig. 2.1). The diversity of vegetation types has been mapped at a finer scale of resolution in the Green Data Book (2009) <http://pryroda.in.ua/blog/chervona-ta-zelena-knyga-2009> that includes information about 800 biotic communities or associations, of which 347 are rare, 354 are endangered and 99 are common. This information is important for national conservation planning, such as the development of an “Ecological Network,” at the landscape scale.

Land use maps are not publicly available in Ukraine at this time. Such maps are needed for assessing the status of biodiversity at the ecosystem level, and for effective biodiversity conservation planning, because they allow actual land use and cover to be compared with potential natural vegetation. The lack of such publically available maps is thought by some of our informants to reflect the fact that they are being suppressed in order to facilitate corrupt and illegal land uses, and changes in land use.

At the species level of biodiversity, the National Atlas and the Red Data Books provide information. The Institute of Zoology of the National Academy of Sciences of Ukraine is the focal point for research on animal species and diversity, and coordinates production of the Red Data Book for animals. The Institute of Botany is the key institution for revisions of the Red Data Book for plants, and the Green Data Book of Ukraine. The Institute of Hydrobiology of the National Academy of Sciences is responsible for studies of freshwater biodiversity including Dnipro River reservoirs, estuaries, and the Danube River, with focus on fishes, especially endangered species. The A.O. Kovalevsky Institute of Biology of Southern Seas of the National Academy of Sciences, in Odessa, is the main institution for studies of biodiversity of the Black and Azov Seas. According to Ukrainian law, regional authorities (Oblasna Rada), and well as the Supreme Council of the Autonomous Region of Crimea, are responsible for approving the Red List of species that should be protected at the regional (oblast) level. As of 2009, regional Red Lists for animals have been approved in only seven (of 24) oblasts (Dnipropetrovska, Zakarpatska, Luganska, Mykolayivska, Poltavaska, Sumska, Kharkivska), and for Kyiv (a “city with special status”).

Habitat maps, showing the distributions and ranges of species in the Red Data Books, do not exist at this time. The Red Data Books are compiled by experts on particular species, and they

rely on their own maps. In the Red Data Books there are some maps showing points where certain species were collected, but as a rule scientists in Ukraine have not used GPS technology to precisely locate points where a particular species was observed or collected, so these maps typically do not provide adequate location information. A database of animal species is being developed by the Institute of Zoology, but access to the data is limited and procedures for accessing it have not been developed yet. Maps of the ranges of some animal species that are hunted or fished, plant species that are exploited for timber or medicinal purposes, and some pests and weeds can be found in the National Atlas of Ukraine (2008). Classification of habitat types according to the European Environment Agency EUNIS classification system (<http://eunis.eea.europa.eu/about.jsp>) is under development by the Institute of Botany of the National Academy of Sciences of Ukraine.

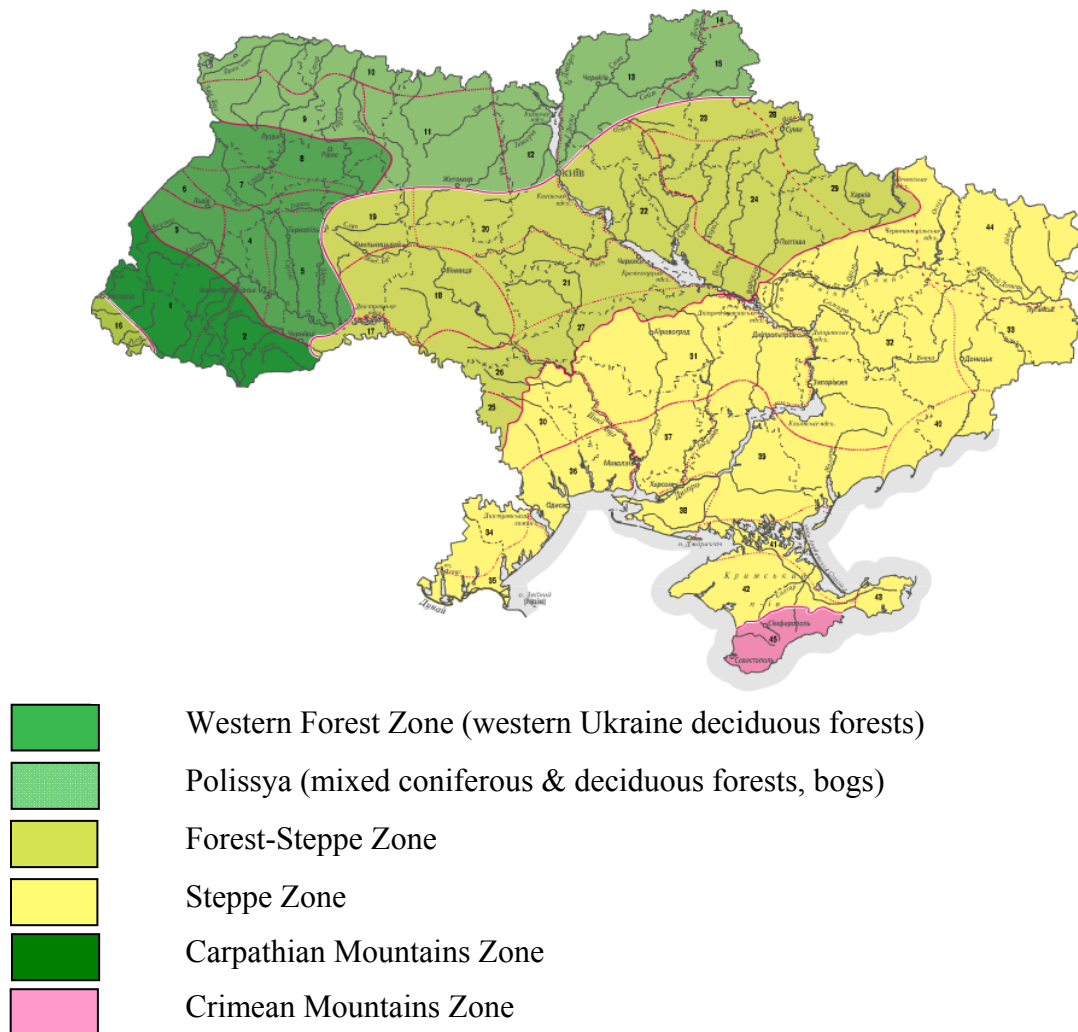
There is no national system of biodiversity monitoring in Ukraine (Gasso, no date). A new public initiative has been recently started on biodiversity monitoring <http://www.biomon.org/en/>. Ukrainian laws (Law on Plants, Law on Animals) state that species should be monitored, but there is no statement that data should be provided to a data base of species. The Red Data Books published ten years ago have fewer species listed, it is not clear how much of this change is due to increasing threat and endangerment of certain species, how much to increasing knowledge of certain species, and how much to changes in criteria for including species in the Red Data Books. An electronic database of animal species is being developed by the Institute of Zoology; an electronic database of plant species has not been started. (See also: <http://www.biostrat.org/>)

Genetic diversity within species is the subject of the scientific field called population genetics. The biodiversity analysis team was unable to find information on this topic in the time available, suggesting that it has not been a common field of biodiversity research in Ukraine.

2.2 ECOSYSTEMS

The terrestrial ecosystems of Ukraine can be generally classified into six “biogeographic provinces,” (closest Ukrainian translation is “geobotanic zones”) as shown in the map on the next page (Fig. 2.1) from the 2008 National Atlas of Ukraine.

These biogeographic provinces are a reflection of the complex interactions between biological species, soils, topography, climate, and human factors that have developed over long periods of evolutionary time in Ukraine. In addition to these terrestrial biogeographic provinces, Ukraine has abundant freshwater, coastal, and marine ecosystems. Ukraine’s biodiversity includes many unique (endemic) species, and unique assemblages or communities of plants and animals, which will be discussed in the appropriate sections below.

Figure 2.1 Biogeographic Provinces of Ukraine (National Atlas of Ukraine, 2008)

Millennia of human occupation and use – hunting, grazing, farming, and use of fire, for example – have had great effect of the ecosystems of Ukraine. Hunting caused the extinction of many large mammals in prehistoric and historic times, many extinct only within the past few hundred years. Some of these were undoubtedly keystone species, essential for maintaining the structure and function of certain ecosystems. It is agriculture that has most dramatically altered ecosystems. About 70% of the natural vegetation of Ukraine has been converted to agricultural systems.

2.2.1 FORESTS: WESTERN UKRAINE AND POLISSYA

Forests were the natural vegetation of the western and northern parts of Ukraine. Forests of western Ukraine are of Central European forest types; in these deciduous forests, hornbeam, oak, and beech are the dominant tree species. The Polissya zone lies in the north and northwest. Nearly one-quarter of this area is covered with mixed forests of pine, birch, oak, and alder. Pine stands account for about 57% of the forest land, and birch about 20% (World Bank, 2006). Bogs cover six percent of Polissya, but this is only about half of their original area. The backbone of

the hydrological system of the region is formed by the Pripyat and Desna Rivers, tributaries of the Dnipro. Natural vegetation is most conserved along the Prypyat River, where it forms an almost continuous belt. This area has one of the largest wetlands in Europe, an important link in one of the main routes of bird migration of the continent. About 400 species of vertebrate animals are found in the region, roughly 80% of which are dependent on wetland and aquatic habitats.

Forests are the potential natural vegetation of about one-third of Ukraine, and now cover approximately 15% -- about one-half of their historically natural area. However, current forests are mostly very different from the natural forests that once existed. Now around 50% of forests are plantations, usually even-aged monocultures, and not natural or naturally regenerating forests. These plantations are generally of native species such as *Pinus sylvestris*, although sometimes planted outside of the historical range of the species. Almost no old, mature, mixed-age forest remains. According to the National Atlas of Ukraine (2008), “As a result of the continuous tree felling the overwhelming majority of forests changed their structure, composition and reduced productivity.” According to the National Atlas of Ukraine, “The age structure of forests is as follows: saplings – 31%, middle age stand – 45%, ripening stand – 13%, adult and declining trees – 11%.” <http://wdc.org.ua/atlas/en/4110100.html> The National Atlas states that the optimum stand structure would allocate 48%, or twice as much area as now, to the two oldest age classes. The unnaturally young age structure of Ukraine’s forests partly reflects reforestation after the Second World War, but it is also the result of management for wood production, rather than for naturalness and biodiversity value.



Polissya forest and bog, Mizhrichenskiy Regional Landscape Park. Photo: B. Byers, March 2011



Monoculture of pine (*Pinus sylvestris*), Mizhrichenskiy Regional Landscape Park. Photo: B. Byers, March 2011.

Biodiversity in forests is highly correlated with age structure and species diversity. Twenty-three percent of plants and thirty four percent of the animals in the Ukraine Red Data Book need “old growth” forest habitats with a significant component of dead and decaying trees and dead wood on the ground. Old dead trees are particularly important for woodpeckers and other cavity-nesting birds, and for bark and wood-dependent insects.

Chernobyl and Wildlife: The Exclusion Zone established soon after the Chernobyl disaster in 1986 encompasses more than 1,600 square miles of northern Ukraine and southern Belarus, an area of forest, bogs, lakes, and rivers typical of Polissya. Populations of typical animals like wolves, wild boar, roe deer, red deer, moose, and beaver apparently have multiplied enormously and begun expanding outside the zone. The area has herds of European wisent (*Bison bonasus*). By early 2005, a herd of 21 rare Przewalski's horses that had escaped from captivity in the quarantined area six years earlier had bred successfully and expanded to 64. Even extremely rare lynx have appeared, and there are reports of tracks of brown bears, an animal not seen in the area for several centuries. The most recent count by the authorities showed that the zone is home to 66 species of mammals and 280 species of birds, many of them rare and endangered. A 2006 report by the Chernobyl Forum—an international panel of 100 experts assembled by the UN, the World Health Organization, and the International Atomic Energy Agency—lent scientific weight to the view that by stopping hunting, agriculture, and other human activities in the zone the Chernobyl disaster allowed wildlife to flourish. “The Exclusion Zone,” the authors concluded, “has paradoxically become a unique sanctuary for biodiversity.” A 2005 book, *The Wormwood Forest: A Natural History of Chernobyl*, made this same case. This claim is not without controversy, however, as a few researchers suggest that some species may be suffering from exposure to radiation (Higgenbotham, 2011).

2.2.2 FOREST-STEPPE

The forest-steppe biogeographic zone covers about one-third of Ukraine, from the Carpathian foothills eastward to the Russian border, and between Polissya in the north and the steppe region to the south (Fig. 2.1). This is the ecological transition zone between forest and grassland ecosystems. Forests, meadow-steppe, wet-meadow and wetland landscapes in river valleys exist together in this area, with forests occupying about 13% of the area (National Atlas of Ukraine, 2008). Oak stands occupy 52% of the forest area, along with mixed forests of oak, hornbeam, beech, alder, and ash (World Bank, 2006). Norway, common, and Tartar maple, ash, and alder are found along streams and rivers, and black poplar and willow forests occur on sandy bottomland in this zone.

In the forest-steppe zone, soils are mostly fertile, humus-rich chernozem (“black earth”) soils, and therefore, as in the steppe zone, large areas of forest were cleared, and the majority of steppe grasslands in this zone were plowed for annual crops (National Atlas of Ukraine, 2008). Plantation forests now make up more than half of the forests of this zone; natural forests are mostly gone. Because few natural landscapes remain in this zone, protected areas are also few in number and small in area. As a result, the biodiversity of this ecoregion, like in the steppe zone, has declined and is highly threatened. A 2004 analysis by the Biodiversity Indicators for National Use (BINU) project listed both forest-steppe and steppe ecosystems as the most threatened in Ukraine; the downward trend in numbers of species of various taxa is greatest in those two biogeographic provinces (Prydatko, Apetova, and Aschmann, 2004).

2.2.3 STEPPE

The steppe biogeographic zone, situated in southern and eastern Ukraine, originally covered approximately 243,000 km², or 40%, of the country. Steppe is a dry temperate grassland ecosystem, generally on chernozem or chestnut soils with a high humus content, and annual precipitation ranging from 300-450 mm per year. Steppe vegetation is dominated by drought-tolerant grasses such as fescue (*Festuca* spp.) and feather grasses (*Stipa* spp.), and forbs. The present fauna of the steppe is dominated by ground-dwelling rodents and ground-nesting birds and their predators. Among the rodents are rabbits, marmots, hamsters, mice, and European mole rats; birds include lark, quail, yellow bunting, partridge, and, less commonly, little and great

bustard. Predators include polecats, foxes, wolves, and birds of prey. The large grazing mammals that were once found on the Ukrainian steppe, such as Przewalski's horse and saiga antelope, were hunted until locally extinct, and are no longer present.

Conversion of native vegetation to agricultural fields was most extreme in the steppe region, mainly because of its highly fertile chernozem soils. As can be seen in Fig. 2.1, steppe is the



Unprotected steppe at Naholnyy Krazh, Lugansk Oblast; 16 Red Data Book plants are found at this site. Photo: B. Bvers. March 2011.

potential natural vegetation of about 40% of Ukraine (National Atlas of Ukraine, 2008). Native steppe vegetation now covers only about 4% of Ukraine, approximately one-tenth of its original area (Parnikoza and Vasiluk, 2010). Steppe habitats continue to be fragmented, degraded, and converted to agriculture or industrial uses. Steppe is the least-conserved ecosystem in Ukraine, and it should not come as a surprise that roughly one-third of the plant and animal species found in the Ukraine Red Data Book (2009) are steppe species (Parnikoza and Vasiliuk, 2010).

2.2.4 CARPATHIAN MOUNTAINS

The Ukrainian Carpathians occupy approximately 56,600 km², almost one-tenth of Ukraine. This zone is characterized by altitudinal zones of vegetation: foothill forests, lower and upper elevation montane forests, and subalpine and alpine zones. Foothill forests are mainly oak (*Quercus robur*), hornbeam, and beech. Montane forests are mainly beech and silver fir.

Above treeline, the vegetation consists of low growing shrubs and grasslands, and the highest elevations support montane grasslands. Lower forest zones are subject to logging pressures as in other forest zones.

2.2.5 CRIMEAN MOUNTAINS

The Crimean Mountains biogeographic zone covers approximately 7,500 km² in the south of the Crimean Peninsula. This area has complex altitudinal zones of vegetation, ranging from forest-steppe at lower elevations, through oak forests; mixed forests of oak, beech, hornbeam, ash, maple, pine, and juniper; to mountain meadows at the highest elevations.

2.2.6 FRESHWATER ECOSYSTEMS AND WETLANDS

Ukraine has seven major river basins, all discharging into the Black Sea except the Northern Bug, which flows towards the Baltic Sea. The Dnipro River basin drains about 65% of the country, the Dnister basin 12%, and the Danube basin 7%. The ecosystems of most rivers, both small and large, have been dramatically altered by human activities. The Dnipro is the longest river in Ukraine, a typical lowland river with a well-developed flood plain, but since the 1960s the Dnipro has been changed into a cascade of reservoirs behind six hydropower dams.

Floodplains are under intensive use (agriculture, urbanization, transportation and industrial infrastructure). Rivers receive pollution from sewage, nutrient runoff from livestock farms and agricultural fields, industrial wastes, and sedimentation from plowed fields and overgrazed areas. Flow in small rivers frequently decreases and becomes less stable, in part due to the drainage of riverine floodplain swamps.

Approximately five percent (4.5 million hectares) of Ukraine is covered by wetlands. There are about 20,000 lakes in the country, and about 12,000 km² of bogs in the Polissya region. Wetlands have undergone significant modification in recent decades, particularly through drainage, irrigation schemes and water diversion. However, Ukraine still has a remarkable number of very important wetlands. Aquatic ecosystems and wetlands support many species included in the Red Data Book of Ukraine (2009), including 45 species of invertebrates, about 40 fish species, and 7 amphibians.



Dniro Delta wetlands. Photo: G. Karpova

Intensive drainage began in 1966 in the Polissya Region to create agricultural land, resulting in the drying of 1.6 million hectares, about 40% of Polissya's wetlands. By 1992, however, almost none of this drained land was agriculturally productive; about half was unproductive because of soil acidification, one quarter from wind erosion, and one fifth from water erosion. Flow

regimes in about 50% of the small rivers of the region have been changed irreversibly, and the water table has dropped by 1-2 meters on average. About 80% of the wetland plant species listed in the Red Data Book of Ukraine are from the Polissya Region (79 species), including ten species protected by the Bern Convention, such as Waterwheel Plant (*Aldrovanda vesiculosa*), Water Butterfly Wings (*Salvinia natans*), Fen Orchid (*Liparis loeselii*), Water Chestnut (*Trapa natans*). Seven species of birds and 17 species of mammals dependent on wetlands are listed in the IUCN Red List, including the globally endangered Aquatic Warbler (*Acrocephalus paludicola*), the Greater Spotted Eagle (*Aquila clanga*), and the Great Snipe (*Gallinago media*).

Deltas and estuarine zones of the rivers entering the Black Sea are important for conserving biodiversity. One of the largest and most important wetlands is the Danube Delta. The majority of the world's population of Red-breasted Goose (*Branta ruticollis*) and Pygmy Cormorant (*Phalacrocorax pygmeus*), 50% of the Palearctic breeding population of White Pelican (*Pelecanus onocrotalus*), 25% of the Western Palearctic population of Spoonbill (*Platalea leucorodia*), and 5% of the world population of Dalmatian Pelican (*Pelecanus crispus*) depend on the Danube Delta wetlands (from 50,000-100,000 water birds winter on the Delta annually). This delta is an important refuge for European Mink (*Mustela lutreola*), Wild Cat (*Felis sylvestris*), and European Otter (*Lutra lutra*). The deltas of the Dniester and Dniro Rivers are also extensive and important wetlands, whose numerous channels, lakes, flooded forests, floodplains, swamps, and swamp-meadows provide habitats for more than 700 wetland plant species. The fish fauna of these deltas is diverse, with about 90 species, including populations of sturgeon.

2.2.7 MARINE ECOSYSTEMS

The Black Sea is a unique marine ecosystem, characterized by a relatively thin surface layer of oxygen-containing water and a deeper anoxic layer below about 150 meters that supports only bacterial life. The Sea of Azov actually is a large bay of the Black Sea. Twenty European countries discharge wastes, including pesticides and heavy metals, into the Black Sea, mainly through the Danube and Dnipro Rivers. Sewage and agricultural runoff carry nutrients, mainly nitrogen and phosphorus, into estuaries and seas, where nutrient loading can deplete oxygen, killing fish and shellfish. Large-scale oxygen depletion is most common in the shallow north-western part of the Black sea, but in 2007 a serious incident occurred in the Sea of Azov. Shipping transportation accidents have resulted in periodic spills of oil and chemicals and coastal contamination. Coastal tourism and recreation can have strong localized negative effects on coastal zones in the summer season, with increases in sewage and solid wastes, and overfishing and overexploitation of marine species such as mussels and crabs for food. Another major threat to biodiversity in the Black and Azov Seas comes from introduced non-native species, as described in Section 4.1.

There are four species of marine mammals in the Black Sea: the Monk Seal *Monachus monachus*, Bottlenose Dolphin *Tursiops truncatus*, Harbour Porpoise *Phocoena phocoena*, and Common Dolphin *Delphinus delphis*. All are included in the Red Data Book of Ukraine. Threats to marine mammals include collisions with vessels and entanglement in fishing nets. Dolphins are threatened by illegal capture for display in aquaria and dolphin shows that are now popular in many cities of Ukraine.

2.3 SPECIES

2.3.1 DESCRIPTION

The known species of plants and fungi (mushrooms and lichens) of Ukraine number around 18,000 species (5,227 mushrooms, 1,322 lichens, 4,908 algae, 763 bryophytes (mosses and clubmosses), and 6,086 vascular plants (National Atlas of Ukraine, 2008). <http://wdc.org.ua/atlas/en/4110100.html> and <http://www.biomon.org/en/>.

The ecosystems of Ukraine provide habitats that support about 45,000 known species of invertebrate and vertebrate animals <http://www.biomon.org/en/>. About 35,000 of these are insect species. The vertebrates in Ukraine include 117 species of mammals, almost 400 species of birds, 21 species of reptiles, 17 species of amphibians, and 182 species and subspecies of fish.

Ukraine has approximately 440 endemics and sub-endemic species. Twelve species of vertebrates are endemic to Ukraine. The fauna of the Black and Azov Seas includes 32 endemic species of invertebrates (National Atlas of Ukraine, 2008). Nine percent of Ukraine's vascular plant species are endemic. Mountains have especially high endemism: in the Crimean Mountains, there are 240 endemics out of a total of 2,400 species, and in the Ukrainian Carpathians there are 133 endemic species of a total of 2050 species. http://www.plantaeuropa.org/eip/country_profiles/assets/pt%20web%20site%20%20dreamweaver/pt%20website%20country%20pages/country/ukraine.html

2.3.2 STATUS

Status of species of conservation concern in Ukraine is reported in the Red Data Book of Ukraine (2009). This book lists species according to three categories. The first category, “threatened,” includes species that are under risk of extinction if threats to their survival are not controlled. The second category lists “vulnerable” species that could move into the threatened category. The third category of “rare” species is those with low population sizes, which are not necessarily threatened or vulnerable as long as their habitats are protected.

The Third Edition (2009) of the Red Data Book of Ukraine: Plants <http://pryroda.in.ua/blog/chervona-ta-zelena-knyga-2009> lists 826 species of conservation concern. The Second Edition (1994) listed only 541 species, a 35% increase in Red Book flora in 15 years. To some extent these increases may be attributed to better scientific knowledge of Ukrainian flora, but the trend also undoubtedly reflects increasing pressure on natural habitats and the species they support. The 2009 Red Book includes 611 species of higher (vascular) plants of conservation concern, 46 species of bryophytes, 60 species of algae, 52 lichen species, and 57 fungi.

The Third Edition (2009) of the Red Data Book of Ukraine: Animals lists 542 rare, threatened, and endangered animal species <http://pryroda.in.ua/blog/chervona-ta-zelena-knyga-2009/> including 226 insects, 20 mollusks, 69 fish, 8 amphibians, 11 worms, 87 birds, and 68 mammals. The previous edition (1996) listed only 382 species. As with plants, it appears that the number of rare, threatened, and endangered animals in Ukraine is increasing.



Wild crocus (*Crocus reticulatus*), Red Data Book of Ukraine-listed plant, Provalskiy Steppe in Lugansk National Nature Preserve, Lugansk Oblast. Photo: B. Byers, March 2011.

A comparative list of the conservation status of all species of Ukrainian fauna, including national, European, and international Red Lists, as well as those covered by conventions and agreements ratified by Ukraine, can be found in Fauna of Ukraine: Conservation Categories Reference Book (2010) (in Ukrainian). <http://www.lucanus.org.ua/articles/redlist-ukr-animals-2010.pdf>

Some species formerly found in Ukraine that were at one point locally extinct are being reintroduced successfully in some places, including European red deer (*Cervus elaphus*), beaver (*Castor fiber*), bobak marmot (*Marmota bobak*), and Przewalski’s horse (*Equus ferus przewalskii*).

2.4 GENETIC DIVERSITY

The diversity of genes within a single species is the subject of the scientific field called population genetics. The biodiversity analysis team was unable to find information about population genetic studies of Ukrainian species in the time available, suggesting that it has not been a common field of biodiversity research in Ukraine. Understanding the population genetic diversity within individual species, and its geographic distribution, is often essential for species

and ecosystem conservation. For example, in the fragmented steppe ecosystem, it is likely that isolated subpopulations of plants and animals carry somewhat different and unique samples of the total genetic variation of the species. Conserving the full range of genetic variation within a species requires conserving these isolated subpopulations. Such within-species genetic variation will be necessary to enable the species to adapt to changing conditions, such as those that may be caused by climate change.

3.0 VALUES AND ECONOMICS OF BIODIVERSITY

Biological diversity provides social and economic benefits of three distinct kinds: ecosystem products, ecosystem services, and non-material benefits (USAID, 2005a; Byers, 2008). Values of each of these types of benefits of Ukraine's biodiversity are summarized below.

3.1 PRODUCTS

Ecosystem products are direct material benefits for such things as food, fiber, building materials, medicines, fuel, and ornamental plants and pets.

Wood and Wood Products

The Analysis Team was able to obtain some data on the quantities and value of wood and wood products produced in Ukraine. Total production of commercial timber in Ukraine has remained relatively steady at around 15 million m³ annually for the past decade. Much of Ukraine's timber supplies the domestic market for wood and wood products. Less than 20% of wood produced is typically exported (State Forestry Committee of Ukraine, 2007). In 2007, the value of exported roundwood and sawn lumber was around \$680 million USD, about 1.7% of total Ukrainian exports; in 2009, the value was \$665 million, or about 1.3% of exports. [http://www.unece.org/timber/mis/market/market-65/ukraine%20\(English\).pdf](http://www.unece.org/timber/mis/market/market-65/ukraine%20(English).pdf). Of the wood produced, pine contributes 38%, oak 14%, spruce 11%, beech 7%, birch 7%, hornbeam 6%, and alder 5%. Sawlogs account for about 32% of the production, fuelwood and industrial raw materials around one-fourth each, with the remainder being construction timber, pulpwood, plywood, and particle board (State Forestry Committee of Ukraine, 2007).

Wild Products

Ukraine is rich in wild products, sometimes called "non-timber forest products" (NTFPs) although they do not always come from forest ecosystems. Many of these are harvested locally and seasonally, and do not enter into trade; others are traded and even exported. Forestry experts told us that information about NTFPs is not available, although the State Agency for Forest Resources (SAFR; formerly called the State Forestry Committee) has recently published some information. The Analysis Team believes that the actual amounts of wild products harvested are likely to be significantly larger than those reported officially. The fact that the SAFR is collecting these statistics is a positive step, and this may signal recognition that the value of forests is not just for wood production. Official data suggest that increasing quantities of some NTFPs are being harvested (State Forestry Committee, 2007). Management plans and harvesting quotas need to be developed for some NTFPs, as some are currently threatened by overharvesting. More than 15 species of wild mushrooms are commonly collected, and nine species of wild berries are commonly harvested, including Lingonberry (*Vaccinium vitis-idaea*), Bilberry (*Vaccinium myrtillus*), Dewberry (*Rubus caesius*), Cornelian cherry (*Cornus mas*), Common cranberry (*Oxycoccus palustris*), Hindberry (*Rubus idaeus*), and Blackcurrant (*Ribes nigrum*).

Table 3.1

Product	Year →	2006	2009
Birch sap (tons)		1,803	3,000
Christmas trees (number)		not available	643,000
Wild berries (tons)		219	3,000
Wild hazelnuts (tons)		not available	11
Mushrooms (tons)		81	558
Tree bark (tons)		not available	58
Wild hay (tons)		not available	2,800
Medical plants (tons)		65	205
Turpentine		1,150	not available

(State Forestry Committee, 2007, 2009)

Natural populations of wild thyme, common buckthorn, marjoram, caraway, cranberry, marsh tea, and sweet flag have declined because of harvesting, and their collection must be limited to protect wild populations (National Atlas of Ukraine, 2008).

Medicinal Plants

Two hundred fifty species of Ukrainian plants are recognized as medicinal plants, including 150 recognized in scientific medicine, and the remainder only in folk medicine. About 100 species are being collected for use, 40-50 of them in significant quantities. The main regions where medical plants are being collected are in the Forest, Polissya, Forest-Steppe zones, and the Carpathians. Some medicinal plants, such as *Adonis vernalis*, *Astragalus dasyanthus*, *Galanthus nivalis*, *Pulsatilla* spp., are used in producing pharmaceuticals. For example, snowdrop, *Galanthus nivalis*, contains an active substance called galanthamine, used in the treatment of Alzheimer's disease. Because of their value, the idea of reserves to conserve populations of these wild species for sustainable production is being discussed.



Birch sap collection for making birch beer, Mizhrichensky Regional Landscape Park. Photo by B. Byers, March 2011.

Fish and Shellfish

Until the early 1990s, Ukraine's catch in the Azov and Black Seas was around 200,000 metric tons, and in some years reaching more than 250,000 tons. Anchovy was the main species caught, forming approximately 80 percent of the catch. Between 1989 and 1991, however, this fishery crashed, due to the intense impact on the food chain of a comb jelly, *Mnemiopsis leidyi*, introduced from the North Atlantic, probably in ship ballast water.

<http://www.fao.org/fishery/countrysector/FI-CP-UA/en>

As can be seen in the table below, fish catches in the

Black and Azov Seas have never recovered from this human-induced ecological collapse, with combined catches reaching only between 50,000-70,000 tons, one-quarter to one-third of their levels in the 1980s. The value of this fishery is now roughly \$20-30 million USD per year. The freshwater fishery in the Dnipro River system has a value of around \$5 million USD per year.

Table 3.2

Area	Year →	2006	2007	2008	2009	2010
Black Sea		28,800	24,600	27,200	27,200	40,500
Azov Sea		28,500	28,300	30,700	30,200	28,900
Dnipro River (reservoirs, estuary)		11,500	12,800	11,500	13,800	12,200
Total		68,800	65,700	69,400	79,200	81,600

The principal species in the Azov and Black Seas catch now are European sprat (*Sprattus sprattus*), European anchovy (*Engraulis encrasicolus*), and Black sea sprat (*Clupeonella cultriventris*, synonym *Clupeonella delicatula*, “tyulka”). Shellfish harvest from the Black Sea is about 1,000 tons annually, mainly mussels (*Mytilus galloprovincialis*). The main fish species caught in rivers and lakes are common carp (*Cyprinus carpio*), goldfish (*Carassius* spp.), silver carp (*Hypophthalmichthys molitrix*), and roach (*Rutilus rutilus*).

Wild Game

Hunting in Ukraine is generally organized by commercial enterprises, which generally rent forest land with populations of game animals from the State Agency for Forest Resources. Hunted wildlife is sometimes fed, and hunting trips are managed by the enterprise. In 2009, there were 988 such commercial hunting enterprises. The most common game animal is wild boar (*Sus scrofa*); in 2009, 232,000 animals were reportedly taken. Other common game species are roe deer (*Capreolus capreolus*), and red deer (*Cervus elaphus*). Bird hunting is also common, both for waterbirds and terrestrial birds. Mallard (*Anas platyrhynchos*), or wild duck, and Greylag Goose (*Anser anser*) are the most common waterfowl taken; for terrestrial species Common Quail (*Coturnix coturnix*), Gray Partridge (*Perdix perdix*), and Pheasant (*Phasianus colchicus*) are most common. More than 10 million birds were reportedly shot in 2009.

3.2 ECOSYSTEM SERVICES

Ecosystem services are best defined as the benefits to humans that result from ecosystem functions and processes, such as:

- Major biogeochemical and nutrient cycles (e.g., of water, carbon, nitrogen, phosphorus);
- Natural pest control by predators in food webs;
- Pollination by insects, bats, and birds;
- Decomposition of biomass, wastes, and pollution;
- Soil formation, retention, erosion prevention, and maintenance of soil fertility; and
- Climate regulation.

This concept has been gaining attention in recent years, but is still not widely understood, in part due to confusing definitions (Byers, 2008). In Ukraine, we found very little use of this term or understanding of the concept, although some of our most knowledgeable informants, including

from the Ministry of Ecology and Nature Resources (MENR), were familiar with the idea and felt strongly that the concept was needed in Ukraine.

Pioneering Work on Ecological Economics and Ecosystem Services in Ukraine: For more than ten years, beginning in the early 1980s, scientists at the Institute of Hydrobiology in Ukraine, led by O.M. Taran and his colleagues, were attempting to estimate the value of ecosystem services provided by Ukraine's rivers and wetland ecosystems. They tried to estimate the monetary value of services provided by aquatic ecosystems, or their replacement cost if the natural services were destroyed by human activities such as the construction of dams. It is now widely recognized that natural aquatic ecosystems provide a number of valuable and sometimes irreplaceable benefits to humans as long as they are functioning properly. Among the ecosystem services of aquatic ecosystems are nutrient cycling, water retention, flood protection, riverbank stabilization, and erosion control. For example, biological nutrients such as nitrogen and phosphorus that are discharged into water from treated or untreated sewage and from agricultural runoff from livestock farms and fertilized fields will pollute aquatic ecosystems, causing algal blooms that can deplete oxygen in the water and kill fish and other animals. Healthy, functioning wetlands and riverbank ecosystems can remove and retain these nutrients, thus reducing the negative effects of this type of pollution. When river floodplain vegetation and marshes are destroyed, this valuable ecosystem service is destroyed. This fascinating and very early attempt at applied ecological economics has been largely forgotten, and likely was never widely known at the time. In other countries now this subject is coming to be widely discussed, and Ukraine can be proud of this pioneering effort by some of its scientists to value the human benefits of functioning ecosystems beginning 30 years ago.

The WWF Danube-Carpathian Program has been a pioneer in introducing the concept of ecosystem services in countries neighboring Ukraine. According to WWF, recent European policy changes such as the Water Framework Directive, Common Agricultural Policy, Rural and Regional Development Policy, combined with the eastward expansion of the EU and the European Neighborhood Programme, have opened a window of opportunity to develop payments for ecosystem services as a major conservation tool.

http://wwf.panda.org/what_we_do/where_we_work/black_sea_basin/danube_carpathian/our_solutions/green_economy/pes/

Research in North American grasslands has shown that greater species-level biodiversity provides greater resilience to drought (Tilman and Downing, 1994

<http://www.nature.com/nature/journal/v367/n6461/abs/367363a0.html>), an example of how biodiversity is important for maintaining certain ecosystem services, such as controlling soil erosion and maintaining nutrient cycling.

3.3 NON – MATERIAL BENEFITS

Besides providing direct material benefits to humans in the form of ecosystem products, and indirect material benefits in terms of ecosystem services, natural ecosystems and species also provide a range of non-material benefits that are important to human well-being and development. These include historical, cultural, spiritual, recreational, educational, and scientific benefits (Byers, 2008; USAID, 2005a).

Ukraine spans a region of ecological transition from forest to steppe. Forest and steppe species have mixed and mingled in Ukrainian ecosystems throughout evolutionary time. Ukraine's human history is also the millennia-long story of the interaction of cultures adapted to steppe and forest ecosystems; this history has created the unique culture and nation of Ukraine. Thus, conserving Ukraine's biodiversity has a clear historical and cultural value, apart from its many direct material benefits.



“Wild Bird with Her Young.” 1961. Maria Primachenko. National Museum of Ukrainian Folk Art, Kijiv. <http://www.artukraine.com/paintings/prymachenko.htm> <http://storinka-m.kiev.ua/article.php?id=826>

tourism and “ecotourism” (see for example <http://www.greentour.com.ua/english/> or http://www.zeleniyturizm.com.ua/en/green_tour/), in general the Analysis Team found a relatively low level of development of this kind. As discussed in Section 5, recreation and tourism is one of the management objectives of several categories of protected areas in Ukraine, notably National Nature Parks and Regional Landscape Parks. Many of these types of PAs have at least some staff dedicated to recreation and tourism. Legislation also provides a financial mechanism for PAs to collect concession fees from tourism operators, although these are underutilized as a means of financing conservation in Ukraine ((GEF-UNDP, 2008).

Science and education are clearly recognized values of natural areas, and these two non-material uses are permitted in virtually all protected areas in Ukraine, including strict nature preserves, as will be discussed in Section 5.

Tourism is one of Ukraine’s fastest-growing industries, with more than 20 million foreign visitors a year and a growth rate of around 5% per year. Ukraine has been a member of the World Tourism Organization since 1997. Historical, cultural, and natural features all attract tourists, but nature-based tourism has been least developed. The protected area system does attract tourists – for example to the “Seven Natural Wonders of Ukraine” http://en.wikipedia.org/wiki/Seven_natural_wonders_of_Ukraine.

Although there is some development of organizations promoting nature-based

4.0 THREATS TO BIODIVERSITY

In this Biodiversity Analysis we have used the “threats-based approach” to biodiversity conservation that guides USAID’s biodiversity programming as the conceptual framework for our analysis (USAID, 2005a, http://pdf.usaid.gov/pdf_docs/PNADE258.pdf). Using this logical framework we first identify the direct, biophysical threats to biodiversity in each of the major ecosystems of Ukraine. Conservation biologists recognize five main types of direct threats to biodiversity:

- Conversion, loss, degradation, and fragmentation of natural habitats;
- Overharvesting or overexploitation of particular species;
- Introduced non-native species that harm native habitats or species;
- Pollution or contamination that harms natural habitats or species; and
- Macro-environmental change, such as climate change, desertification, or disruption of natural disturbance regimes (such as floods or fires).

We then describe the main causes of those direct threats. Causes can generally be described as one of three types:

- Social causes;
- Political, institutional or governance causes; and
- Economic causes

Lack of enabling conditions of these three types – the absence, weakness, or inadequacy of conditions that would result in conservation – is what threatens biodiversity. Once these causes have been identified, the actions needed to address, reduce, and/or remove them can be determined (USAID, 2005b http://pdf.usaid.gov/pdf_docs/Pnade195.pdf).

4.1 DIRECT THREATS

Ukrainian ecosystems and species are experiencing all of the types of direct biophysical threats listed above. A summary of the main threats in each of Ukraine’s main ecosystems is given below:

Ecosystem	Threats
Forest	Loss and fragmentation of remaining mature, diverse natural forests from forestry management practices (legal logging) and illegal logging
Forest-Steppe	Loss and fragmentation through conversion to agriculture, tree planting (afforestation) for shelterbelts, and illegal logging
Steppe	Loss and fragmentation of remaining natural steppe through conversion to agriculture, tree planting (afforestation) for shelterbelts; degradation through overgrazing and illegal mining
Carpathian Mountains	Loss and degradation of forests from forestry management practices and illegal logging
Crimean Mountains	Loss and fragmentation of habitat from infrastructure development, human-caused fire, and overharvesting of selected species

Ecosystem	Threats
Freshwater Ecosystems and Wetlands	Loss and fragmentation through drainage and conversion to agriculture and infrastructure (houses, roads, industries, recreational sites), mining of granite and sand, and extraction of peat from bogs; degradation from agricultural, urban, and industrial pollution; habitat and species loss from dams and altered flow regimes of rivers; degradation from introduced non-native species
Coastal Wetlands	Loss and degradation from infrastructure (housing, roads); loss of species from over-hunting; degradation from agricultural and industrial pollution
Marine Ecosystems	Degradation from introduced non-native invasive species; degradation from agricultural and industrial pollution; loss of species through overfishing and destructive fishing practices

Introduced Non-Native Species pose a serious threat to Ukraine's biodiversity. Perhaps most threatened are the marine ecosystems of the Black and Azov Seas. In only the last 50 years about forty new species of animals and plants were introduced inadvertently, such as through discharge of ballast water from ships. A predatory snail, *Rapana thomassiana*, introduced from Asia in the late 1940s almost completely destroyed populations of native oysters and inflicts serious damage to ecologically and economically important mussel populations. A much more catastrophic threat was the introduction of the comb jelly *Mnemiopsis leidyi*, introduced in the Black Sea from the North Atlantic. After its appearance at the end of the 1980s, the amount of zooplankton declined dramatically, causing populations of plankton-eating fish such as the Black Sea anchovy, tyulka, and sprat to crash to less than one-tenth of their former levels. The situation actually improved in the late 1990s when another large non-native comb jelly, *Beroe ovata*, appeared. *Beroe* is a predator of *Mnemiopsis*, and so controlled its numbers, allowing plankton to recover somewhat.

The flora of Ukraine includes 830 non-native plants, or 16% of all species. Twenty-nine species intruded during last 150 years; 24 of them are still continuing their rapid expansion (National Atlas of Ukraine 2008 <http://wdc.org.ua/atlas/en/4110100.html> viewed 14 April 2011). A list of invasive species has been developed by the State Plant Quarantine Service of Ukraine State Customs Service of Ukraine, and Ministry of Health of Ukraine. Eradication programs are conducted on common ragweed, *Ambrosia artemisiifolia*, an introduced invasive plant from North America. The European Network of Invasive Alien Species (NOBANIS) maintains a database of invasive species, but Ukraine is not yet a member of the network. <http://www.nobanis.org/About> Ukraine's neighbor, Poland, has 119 invasive and 73 potentially invasive species according to NOBANIS. The introduced American mink (*Neovison vison*, synonym *Mustela vison*) is gradually supplanting European mink, which has become rare and is already registered in the Red Data Book of Ukraine. http://www.nobanis.org/files/factsheets/mustela_vison.pdf The raccoon dog (*Nyctereutes procyonoides*), introduced from East Asia, is a predator on ground-nesting birds, including waterfowl.

Climate change poses a threat to many of Ukraine's ecosystems. Forecasts of the effect of climate change on surface water resources and the hydrological regime have been made by the National Climate Program for each of Ukraine's biogeographic regions (Manukalo, 2009). In

the Polissya/Forest zone an increase in precipitation is forecast, leading to a 15-25% increase in mean annual runoff in northern rivers. Precipitation is expected to decrease in the Forest-Steppe and Steppe ecoregions, resulting in a decrease in mean annual runoff of up to 30-50%. An increased risk of drought is forecast in the southern Forest-Steppe and Steppe zones. Increased precipitation is predicted to lead to an increase in the frequency of flooding in rivers of the Ukrainian Carpathians. Ecosystems and species will have to adapt to these climate changes, as will human societies. The research in North American grasslands mentioned earlier that showed that greater species-level biodiversity provides greater resilience to drought (Tilman and Downing, 1994) provides another argument for the need to conserve biodiversity in Steppe and Forest-Steppe zones, given that drought in those areas is a predicted effect of climate change.

4.2 CAUSES

4.2.1 SOCIAL

The analysis team found the following to be the most significant social causes of the threats to biodiversity in Ukraine:

- Lack of public awareness and knowledge about biodiversity and its value;
- Lack of public interest in biodiversity conservation; and
- Lack of motivated constituency to advocate for biodiversity conservation

Public Awareness and Biodiversity Conservation: According to a pilot survey made in March 2011 near Mizhrichensky Regional Landscape Park in Chernihivsky oblast north of Kyiv, and around Tovtry National Nature Park on the Dniester River in Khmelnytsky oblast by members of the NGO EcoClub “Green Wave,” local people who live around the park very often do not even know that the park exists. When told by the survey team that they are living near a protected area, they did not understand its purpose. The survey showed that most people do not understand the word “biodiversity.” The word “nature” to most of those surveyed signified a place to harvest wild foods such as berries or mushrooms. Mizhrichensky Regional Landscape Park is proposed to become a National Nature Park. The process was initiated by scientists and the administration of the regional park, but local communities have not been consulted and did not participate in the decision to upgrade the park from regional to national status.

The Analysis Team found that these social causes of threats to biodiversity have not changed much over the past decade, for reasons that have to do with the history and management objectives of the PA system in Ukraine that fail to build public interest in, and a committed constituency for, biodiversity conservation, as will be discussed in Section 5.3. These causes also remain largely unchanged because although many of Ukrainian NGOs conduct environmental education activities, those mostly aim at children, not adults, and often focus more on issues such as pollution, and not biodiversity conservation.

4.2.2 POLITICAL/INSTITUTIONAL

The largest number of specific causes for the biodiversity threats listed above are due to political, institutional, and governance issues.

- Forestry policies and practices that do not adequately recognize biodiversity and its value;
- Agricultural policies that do not adequately recognize biodiversity and its value;
- Water policies do not adequately recognize the value of wetlands and freshwater biodiversity;
- Inadequate capacity (staff, training, and resources) in relevant agencies to carry out

mandated responsibilities for conservation administration, management, and enforcement (such as enforcement of fishing, hunting, and forestry laws);

- Inadequate mechanisms for public participation in national environmental decisions;
- A relatively weak biodiversity conservation NGO sector;
- Scientific institutions are weak in an applied, multidisciplinary, “conservation biology” perspective; and
- Educational institutions are generally oriented toward preparing students for disciplinary careers in biological science or forestry; interdisciplinary training for conservation that blends biological and social sciences is lacking.

According to one of our key informants, a well-respected senior Ukrainian biologist working in the NGO sector, “Sectoral policies of the economy involving water management, farming, forestry and fishery very poorly take into account biota preservation priorities. The policy of the agricultural sector which is responsible for 70% of the area of the country totally ignores these components. The picture is even worse if one considers the implementation of declared priorities.” In terms of the threat to forests caused by forest management policies and practices, a US forest scientist who recently worked in the Ukraine on identifying “High Conservation Value Forests” with the National University of Life and Environmental Sciences of Ukraine, WWF, and the Forest Stewardship Council said: “Everywhere that I worked in Ukraine I got the following impression: a major barrier to protecting forest biodiversity is the disconnect between ecologists and foresters on what constitutes a ‘healthy, productive forest.’ Biodiversity is understood by academic forest scientists, but really hasn't entered into the mentality of professional foresters. A major part of their job is to convert ‘decadent, declining’ natural forests to high-productivity plantations. The fact that many forests in Ukraine are zoned for ‘protective’ purposes slows them down, but by no means gives these forests real protection from conversion.”

Biodiversity and Forestry Policies and Practices in Ukraine: “A comparatively large amount of natural, biologically diverse forests remain (large for Europe, that is), but that practically all of them that are not located in federal-level protected areas are in danger of being lost in the near future. Forest management in Ukraine is well-organized and effective at producing high-volume timber stands, but is basically unprepared to address biodiversity. The management paradigm is always clearcut-plant-thin-clearcut, even in regions where natural regeneration and uneven-age silviculture are possible. The same indicators ecologists might use to identify late-successional forests with high biodiversity value (gap dynamics, presence of large snags, cavity trees and downed logs), Ukrainian foresters regard as signs of forest decline. This is not unique to Ukrainian foresters of course, but I would say they are rather obsessed with the idea of “forest health” (that is, fully-stocked forests producing maximum volume), and they often cut old-growth forests even when there is limited commercial value there. In Boyarka, the foresters at the Forest Research Station are cutting in Dzvinovsky Zakaznik, one of the largest remaining blocks of old-growth, high-productivity pine forest in Ukraine (600 ha). The canopy is beginning to thin out and the foresters have decided that such decline is an unacceptable condition. In the past five years, they severely fragmented the zakaznik, and as part of FSC certification, we were only able to convince them to conserve 200 ha as an old-growth reserve. The rest is being rapidly cut, although they are leaving some reserve trees. I am very glad that at least 200 ha will be protected (theoretically), but in general I am pretty frustrated that even an important protected area is being converted to even-aged plantations.

In southern Vinnitska Oblast/northern Odessa Oblast, a major ice storm severely damaged thousands of hectares of *Quercus petraea* forests. This region includes the largest massifs of this species in Ukraine, on the northern edge of its range. There is no doubt that major salvage logging is necessary, but I also would argue for protection of the *Quercus petraea* genetic resource through reservation of individual healthy canopy trees or stands with potential for recovery. Natural regeneration of this species is possible, I saw good advance regeneration in some stands. But the strategy is salvage clearcutting and the establishment of *Quercus robur* plantations.” (Source: email from Brian Milakovsky, US expert on biodiversity and forestry in Ukraine, 10 April 2011)

The problem of inadequate capacity in relevant agencies was widely recognized by our informants from within the government, NGOs, and the donor community. One donor-funded project, the GEF-UNDP “Strengthening Governance and Financial Sustainability of the National Protected Area System in Ukraine” project, addresses this issue in the Department of Protected Areas (formerly called the State Service for Protected Areas). The Project Document for that project stated that “The State Service, which is the main institution vested with the responsibility of managing the PA system, has 25 staff. These staff must fulfill a level and scope of responsibility comparable to that of a fully staffed ministry with a central unit and local branches. The State Service relies on regional branches of the Ministry of Environment to implement its mandate. Further, the reporting line between the central-level State Service and oblast level departments of the Ministry of Environment (MoE) is blurred. As a result, even though the MoE has delegated PA management at the central level to State Service, it has no real authority to supervise oblast departments, greatly inhibiting its ability to enforce protected area policies at the oblast level. Effective management of the PA system is also being compromised by deficiencies in the skills set of staff responsible for PA management.” (GEF-UNDP, 2008)

Lack of capacity (staff, training, resources) among biodiversity-conservation NGOs clearly limits the effectiveness of their advocacy for conservation. As discussed in Section 6, this lack of NGO capacity has not always been recognized by those who do not distinguish “environmental” NGOs from NGOs whose focus is on biodiversity and its conservation. The difficulty faced by civil society organizations in influencing government is heightened by the lack of adequate mechanisms for public participation on the part of the government. And, of course, NGOs efforts may remain weak in the absence of anything more than the tiny public constituency for nature conservation that currently exists in Ukraine among the general public. NGOs will most likely not be able to organize an effective voice for biodiversity conservation without major changes in public awareness and knowledge about biodiversity and its value.

The Analysis Team found that the political and institutional causes of threats to biodiversity have not changed much over the past decade. Forestry, agricultural, and water policies have not been reformed. Recent government restructuring has in some cases decreased the number and authority of staff needed to carry out mandated responsibilities relevant to biodiversity conservation. Mechanisms for public participation in national environmental decision making are still weak. One hopeful change is that skills and experience of NGOs dealing with biodiversity conservation is improving.

4.2.3 ECONOMIC

Economic factors underlie many of the direct threats to Ukraine’s biodiversity. The Biodiversity Analysis Team found that some of the most significant economic causes involved:

- Lack of economic opportunities for local people living near protected areas (such as nature-based tourism/ecotourism, income generation from harvesting of NTFPs, local Payments for Ecosystem Services schemes) that might motivate them to support conservation;
- Lack of economic incentives and disincentives in the forestry sector for ecologically-sustainable forest management (such as price-premiums for certified timber, enforcement and collection of fines for illegal logging);
- Lack of economic incentives, and disincentives, for conservation of steppe vegetation (such as conservation bank programs, enforcement and collection of fines for illegal grazing or mining);

- Lack of economic incentives and disincentives for conservation of wetlands and fisheries and other freshwater and marine biodiversity;
- Lack of knowledge of the economic value of ecosystem services; and
- Lack of a strategy and mechanism for sustainable financing of the protected area system, and in particular for its dramatic proposed expansion into a National Ecological Network by 2020.

In Section 3, we briefly discussed the values of biodiversity in terms of the products, ecosystem services, and non-material benefits it provides. In our search for information and statistics about the value of biodiversity we encountered a revealing lack of information. Adequate data even on the value of timber and wood products was difficult to find, and we could not find values for the many non-timber forest products that are harvested. Values for ecosystem services have apparently not been estimated except in a few cases, and the current or potential value of nature-based ecotourism requires adequate analysis.

The issue of the lack of sustainable conservation financing is one theme of the current GEF-UNDP project with the Department of Protected Areas, discussed above. The problem is clearly stated in the Project Document: “The approximate revenue profile for the PAs of national/ regional/ international importance (Biosphere Reserves, Nature Reserves, NNPs and RLPs) taken together is as follows: (i) US\$4 million for recurrent costs - annual allocation from the state budget; (ii) US \$4.4 million annually for capital improvements; and (iii) \$400,000 annually from self revenue generation, most of which is from sanitary felling. Thus, PAs depend on the state budget for 95% of their income. ... under a business as usual scenario... an expansion of the PA system that is unaccompanied by a strategy for revenue generation, the Ukrainian PA system will be driven further away from sustainably meeting its conservation objectives. The PA system is severely underfinanced.

Current financing flows to PAs cover only up to 60% of what has been projected as needed to properly implement PA management plans. There is a chronic shortage of resources for active habitat management, scientific research, awareness-raising, capital items needed to support enforcement, and rewarding salary scales for PA teams. The Ukrainian Protected Areas Act allows PAs to establish entry fees and impose user charges on resource-users, and retain 100% of the revenues raised from charges on these activities. Legal provisions are not put to good use because PA management planning has not been underpinned by business planning. There is a lack of capacity and experience within the Ukrainian institutions responsible for PA management to systematically tap alternatives to government funding.” (GEF-UNDP, 2008).

The Analysis Team found that the economic causes of threats to biodiversity have generally become worse in the last five years. Tax reforms begun in 2010 make the situation more difficult for small businesses that may have provided economic incentives for local people living near protected areas to support conservation. The economic crisis has led to further pressure for the unsustainable exploitation of forest resources. Global economic forces are leading to the expansion of large-scale commercial agriculture, adding to pressure for steppe conversion. The economic value of ecosystem services has not been widely recognized. Finally, the expansion of the protected area system in a period of economic stagnation has placed further demands on the already underfunded system.

5.0 GOVERNMENT POLICIES, LAWS, AND INSTITUTIONS

5.1 POLICIES AND LAWS

The Government of Ukraine's official view about the importance of biodiversity conservation in the larger national agenda is given in the *Strategy for National Environmental Policy in Ukraine to 2020*. This is official policy from the Verhovna Rada, the national parliament, approved on December 21, 2010. It was signed by the President of Ukraine. The previous such strategic document, *Main Directions for Ukraine's State Policy in the Field of Environmental Protection, Natural Resources Use and Securing Ecological Safety*, was approved by the Verkhovna Rada in 1998. The old policy was outdated and needed serious revision.

A *National Action Plan for Environmental Protection in Ukraine for 2011-2015*, was developed during the last half of 2010 for implementing the above Strategy. On December 15, 2010, the Cabinet of Ministers of Ukraine approved a draft funding agreement "On Support for the Implementation of the Strategy for the National Environmental Policy of Ukraine." <http://www.menr.gov.ua/content/article/7677> Public hearings on this Action Plan were held in February 2011. This National Action Plan contains a list of "actions needed" for environmental protection, including many related to biodiversity conservation. The Biodiversity Analysis Team translated this list, which we present and discuss in Section 7 of this report. It should be noted that although these points came from what was called an "Action Plan," these are not really "planned actions," but rather a summary list of unaddressed "actions needed" for conserving Ukraine's biodiversity. Some see it as a "wish list" to be used by Ukraine in seeking financial support from the EU and other international donors.

Ukraine has an extensive body of environmental laws and policies, many of which provide guidance on biodiversity conservation and protected areas. Key laws and legislated programs include:

- Environmental Protection Act (last amended December 2010): The Act sets up the overall environmental framework and is the paramount legal act for all environmental activities; it briefly discusses biodiversity conservation.
- Land Code (last amended March 2011): Ukraine's land use legislation, it is supposed to ensure "rational land use and protection of lands," as well as "environmental security." The Land Code divides all lands of Ukraine into nine categories by the purpose of their end use, including four categories especially relevant to biodiversity conservation: protected areas, forest lands, agricultural lands, and water lands.
- Protected Areas Act (last amended December 2010): The main framework for the governance, conservation, and effective use of protected areas in Ukraine; establishes a classification of protected areas.
- Forest Code (last amended December 2010): The Forest Code covers not only forested lands, but all lands supervised by the State Forestry Committee, which include many wetlands and certain agricultural lands.

- Water Code (last amended December 2010): defines roles and responsibilities of state institutions in water management, briefly mentioning that waters found within protected areas are thereby protected.
- Law on Ecological Expertise (IEE) (1995): remains the framework for environmental impact assessments (EIAs) that apply to new projects that may have adverse impacts on the environment.
- Law on the Ukraine Nature Reserve Fund (1992).
- Law on Animals (2001).
- Law on Plants (1999).
- Law on the Red Book of Ukraine (2002).
- Law on Environmental Audits (2004).
- National Program for Establishment of the Ecological Network in Ukraine in 2000 – 2015 (adopted as law in September 2000): The objective of the program is to establish an EcoNet in Ukraine by 2015 in a manner compatible with the pan-European EcoNet. The EcoNetwork has 3 tiers – natural regions (which normally should have a protected area as its core), buffer zones, and corridors. One of the key objectives of the EcoNet Program is to extend the EcoNet coverage and thus maintain as much as possible of ecosystems in their natural condition, while allowing for sustainable economic activities (both within and outside of protected areas).
- Action Program for Biodiversity Conservation and Protected Area Management in Ukraine through 2020 (adopted by Cabinet of Ministers of Ukraine in February 2006): The Program calls for the establishment of a representative and well-managed protected area network, the “Ecological Network” or “EcoNet,” by 2020.

Our analysis of biodiversity threats and causes, summarized in the previous section of this report, identified a major gap in policy and law related to land use, agricultural, forestry, and water policy as a key cause of the threats to Ukraine’s biodiversity: those sectoral policies and the laws that implement them do not recognize biodiversity conservation as an important, cross-cutting objective. One informant told us: “Sectoral policies of the economy involving water management, farming, forestry, and fisheries barely take biodiversity conservation into account. The policy of the agricultural sector which is responsible for 70% of the area of the country totally ignores it.”

Despite this large policy-level weakness, another perspective that also has merit is that, at least for protected areas, the policy and legislative framework is adequate, but lack of implementation is the problem. This will be discussed further in Section 5.3.

5.2 INSTITUTIONS

Governmental restructuring was started in 2010 with the law issued by the President on “About optimization of the system of central organs of executive power” under which the system of central governmental bodies, state agencies and local authorities will be reformed <http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1085%2F2010>. The structure and functions of ministries and agencies with roles in biodiversity conservation are currently

undergoing revision, so our discussion of institutional roles and responsibilities can only reflect the current situation as we understand it.

The Ministry of Ecology and Natural Resources (MENR) is the central national authority responsible for environmental management and biodiversity conservation. The MENR implements national environmental policies and laws, and coordinates environmental activities with other ministries and executive agencies. In the current structure, MENR manages the State Ecological Inspectorates and coordinates the activities of State Committees on Land, Water, and Forestry Resources. It also manages protected areas and is responsible for developing the National Ecological Network. The Environmental Inspectorate Unit within the MENR oversees all aspects of the MENR's work, including management of protected areas.

The MENR interacts with the Verkhovna Rada, especially through the Committee on Environmental Policy, Nature Management and Elimination of the Consequences of the Chernobyl Disaster. The Committee assesses the implementation of policies, laws, and regulations, and holds public consultations and parliamentary hearings. The legislative branch establishes the policy fundamentals and approves laws and development programs. The executive branch usually develops environmental strategies and policies and regulations.

At the regional (oblast) level, environmental management, including biodiversity conservation, is the responsibility of offices of the State Department of Environmental Protection in Ukraine's 24 oblasts, the cities of Kiev and Sevastopol, and the Autonomous Republic of the Crimea. These offices coordinate oblast-level activities with the MENR. The EIU has representatives in each oblast.

At the national level, since the 2007 USAID FAA-119 Biodiversity Analysis, the State Service for Protected Areas has been dissolved, and replaced with a new State Agency for Protected Areas to manage the areas under the Nature Reserve Fund. In terms of actual management, MENR manages around half of the national PAs, the State Agency of Forest Resources (formerly called the State Forestry Committee) about one-quarter, with the rest managed by various other institutions, such as the National Academy of Sciences; Ukrainian Academy of Agrarian Sciences; Ministry of Education and Science, Youth, and Sport; and Taras Shevchenko National University. The Ministry of Agrarian Policy does not supervise any PAs, but has to be consulted if new PAs are proposed on lands managed by that Ministry.

The State Agency of Forest Resources (SAFR) develops national policies and regulations for forestry and hunting, implements them, and is charged with ensuring inter-ministerial coordination related to forestry and hunting. SAFR is entrusted, among other things, with forest management, timber harvesting, afforestation and reforestation, forest conservation, and hunting. It sets limits for logging, hunting and NTFP collection. SAFR is directed and coordinated by the Council of Ministers.

In terms of the threat of introduced non-native species, three GOU institutions play a role: a list of invasive species has been developed by the State Plant Quarantine Service, State Customs Service, and Ministry of Health.

A number of national research institutions within the National Academy of Sciences of Ukraine provide the scientific information relevant for biodiversity conservation. The Institute of Zoology of the National Academy of Sciences of Ukraine is the focal point for research on animal species and diversity in Ukraine. It coordinates revisions of the Red Data Book for animal species, has an important role in monitoring biodiversity, and provides training for zoologists and ecologists. It is the scientific supervisory institution for many PAs, and coordinates the Inter-Sectoral Commission on Protected Areas. It is also the key scientific institution concerning animal species for Ukraine's participation in international treaties such as the CBD, CITES, Ramsar, and Bern Conventions. The Institute of Botany of the National Academy of Sciences is the main institution in Ukraine for studies of plant species and biodiversity. It is the key institution in development and revisions of the Red Data Book for plants, and for the Green Data Book of Ukraine.

The Institute of Botany supervises research activities in several protected areas, and is the key scientific institution regarding plants for Ukraine's participation in international conventions. The Institute of Hydrobiology of the National Academy of Sciences of Ukraine is the main institution in Ukraine for aspects of freshwater biodiversity, including that of the Dnipro River reservoirs, estuaries, and Danube River, with a focus on fishes, especially endangered species. For marine biodiversity of the Black and Azov Seas the A.O. Kovalevsky Institute of Biology of Southern Seas of the National Academy of Sciences, in Odessa, is the main national research institution. It conducts research on the biodiversity of marine ecosystems, and their structure and function, and on human influences on these ecosystems. It is also responsible for monitoring of marine species and developing the scientific basis for sustainable use of living marine resources.

Taras Shevchenko National University and local universities are also involved in fundamental and applied research concerning biodiversity, mainly at the local level. Professors and students provide studies of animal and plant species, monitor the biodiversity of local protected areas, and provide baseline information that may lead to the creation of new protected areas. The National University of Life and Environmental Sciences (formerly called National Agrarian University) is involved in education and research on biological resources, including forest resources, aquatic species, and the conservation of agro-biodiversity, including local breeds of livestock and traditional crop varieties.

The responsibility for development and coordination of tourism in Ukraine, including nature-based tourism and agro-tourism, falls under the Ministry of Culture and Tourism. Although tourism is stated to be a priority in economic and cultural development, lack of human and financial resources, and recent restructuring of responsibilities with relevant agencies, have hindered strong national leadership in its development. In the State Strategy of Regional Development of Ukraine to 2015, the development of tourism is recognized as a state priority for several regions, including four located near the western border of Ukraine (Volyn, Transcarpathian, Lviv, Ivano-Frankivsk Oblasts).

5.3 PROTECTED AREAS

The national system of protected areas is currently composed of more than 7,000 protected areas covering around 2.8 million hectares, somewhat more than 5% of the national territory. The protected area system was established in 1992 by the "Law on the Ukraine Nature Reserve Fund," which defined a national system of protected areas for an independent Ukraine. It was, however, based on the perspective on nature conservation and the system of protected area

categories that developed throughout the former Soviet Union. This has led to some difficulty in comparing it with current global concepts and categories of protected areas. A key to understanding this are the Russian or Ukrainian names of the protected areas: zapovednik, zakaznik, and “park.” **Zapovednik** (Russian: заповедник, plural заповедники, from the Russian заповедный, "sacred, prohibited from disturbance, committed [to protect], committed [to heritage]") is an established term throughout the territory of the former Soviet Union for a protected area which is kept "forever wild." It suggests strict nature protection, with human entry and use limited mainly to scientists. The closest English translation would therefore be “nature preserve” or “nature sanctuary.” **Zakaznik** (Ukrainian: singular: заказник; plural: заказники, transliterated: *zakaznyk, zakaznyky*;) is a type of protected area in Russia and other former Soviet republics such as Ukraine where temporary or permanent limitations are placed upon certain on-site economic activities, such as logging, mining, grazing, hunting, etc. (Protected Areas of Ukraine, http://en.wikipedia.org/wiki/Protected_areas_of_Ukraine viewed 19 April 2011)

The Law on the Ukraine Nature Reserve Fund defined eleven categories of protected areas, only five of which form the core of the protected area system. Table 5.1 summarizes key aspects of the protected areas system:

Table 5.1: Protected Areas of Ukraine

PA Category Name (Eng/Ukr)	#	Area, ha	% of PA Network	Principle Purposes	IUCN Category
National Nature Preserve/ Natsionalny Pryrodnyy Zapovednik	19	205,000	5.5	Strict protection, scientific research, education	I
Biosphere Preserve/ Biosphernyy Zapovednik	4	251,000	6.7	Strict protection, scientific research, education	I
National Nature Park/ Natsionalnyy Pryrodnyy Park	47	1,216,000	32.6	Conservation, nature recreation, science, education	II
Regional Landscape Park/ Regionalnyy Landshaftnyy Park	58	648,000	17.3	Conservation, nature recreation, education	V
Nature Reserve/Zakaznik	2922	1,282,000	34.2	Conservation, restoration of natural habitats & species	IV, VI
Protected Site/ Zapovidne Urochyshe	803	97,000	2.6	Protect specific natural feature	III
Nature Monument/Pamyatnyk Pryrody	3245	28,000	0.7	Protect specific natural feature	III
Other categories, not natural	641	18,000	0.4	Zoos, botanic gardens	Not Applicable
Total	7739	3,745,000	100.0		

Sources for Table 5.1:

State Agency for Protected Areas, April 2011

GEF-UNDP, 2008; Categories of Protected Areas of Ukraine:

http://en.wikipedia.org/wiki/Categories_of_protected_areas_of_Ukraine

IUCN Protected Area Management Categories:

http://www.iucn.org/about/work/programmes/pa/pa_products/wcpa_categories

Analysis of the information in Table 5.1 leads to several important conclusions:

- Nationally-managed PAs make up less than 40% of the area of Ukraine's PA system,
- Strict nature preserves, closed to most entry and human uses, make up more than one-third of the nationally-managed PAs,
- Regional Landscape Parks, which are managed at the oblast level, make up nearly a quarter of the PA system, and
- Nature Reserves (Zakazniks) cover more area than nationally-managed areas.

These conclusions suggest the important role in biodiversity conservation played by Regional Landscape Parks managed at the oblast level with input from local councils, and Zakazniks, administered through regional offices of the MENR and managed by local councils and landusers.

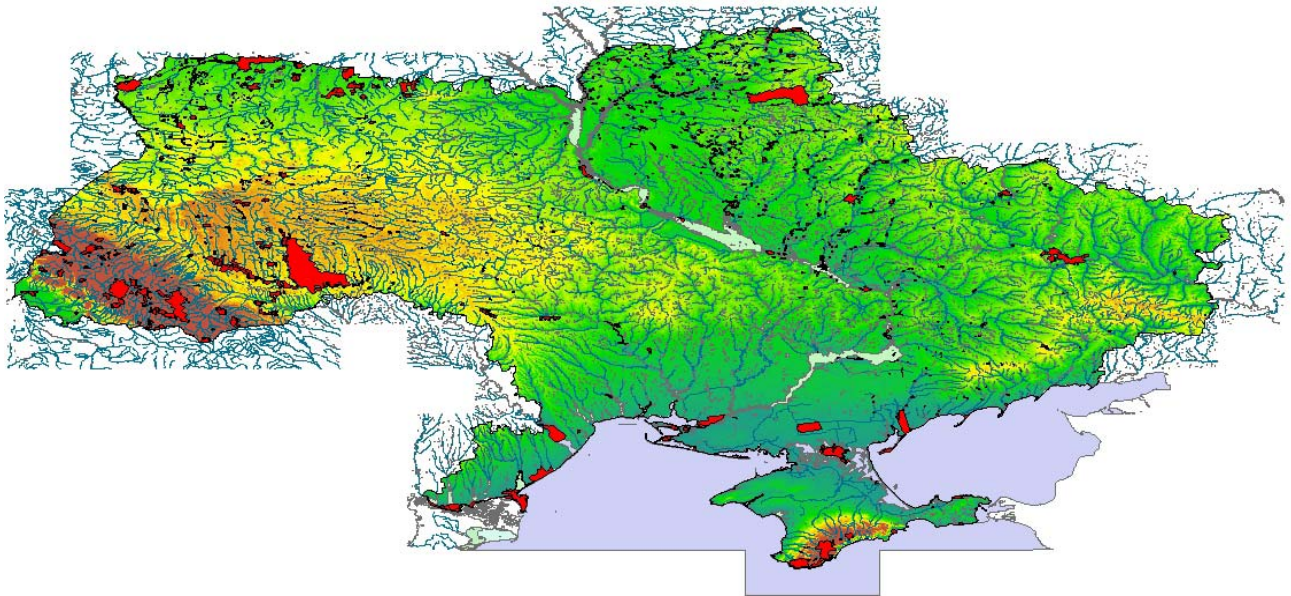


Figure 5.1: Protected Areas of Ukraine (produced by O. Tarasova, 2011, with data from World Conservation Monitoring Center, 2009)

Our SOW (Annex C) requested “an updated list or maps (if available) of all protected national parks, forest resources, animal sanctuaries, wildlife refuges, and other protected areas” We therefore include the map in Fig. 5.1, the source for which is data from the World Conservation Monitoring Center, available at http://www.protectedplanet.net/#6_48.5_30.5_0 or <http://widgets.gbif.org/pa/#/country/UA>. Those sites display similar maps to Fig. 5.1, which was

produced by downloading ArcGIS shapefiles of the PAs of Ukraine. Table 5.1 provides a summary of the current PAs in Ukraine; providing a list of the 7,739 PAs would require hundreds of pages, exceeding the length limit for this report.

Between 2004 and 2011 the total area of the PA system of Ukraine increased from 4.6% to 5.7% of the national territory, and there is a plan for a further rapid increase to 10.4% by 2015. Since 2004, 570 new PAs have been established, including 32 National Nature Parks, 274 Nature Reserves (Zakazniks), 201 Nature Monuments, 14 Regional Landscape Parks, and 18 Protected Sites. During the last two years there has been an especially rapid increase in the number of PAs and an expansion of the area of some current PAs, based on Presidential Decrees made in 2008. As mentioned in Section 3.3, some categories of PAs, especially National Nature Parks, Regional Landscape Park, and Biosphere Reserves, have nature-based tourism and recreation as one of their management objectives. Other categories of PAs, such as National Nature Preserves, Biosphere Preserves, Nature Reserves, and Nature Monuments currently do not permit recreational tourism. However, the possibility for broadening the management objectives of some of these types of PAs to permit nature tourism is under discussion, as a mechanism for self-financing their conservation and management.

National Nature Preserves have the strictest restrictions on use, and there is no zoning of uses within the preserve – the entire area is managed for the same, limited objectives. Rangers responsible for ensuring these restrictions are generally full-time staff of the preserve. Salaries are low, so usually the qualifications of these rangers are not high. Protected areas of this category are financed from the national budget. If the budget of the reserve is low, the number of rangers is often not sufficient for control of the whole area, and illegal use for hunting, fishing, and gathering mushrooms, berries, and medical herbs by local people may occur. Biosphere Preserves are also under strict protection, and financed from the national budget. Their territories are zoned into areas of strict protection, buffer zones, and zones of “anthropogenic landscapes,” and this gives more opportunities for creating additional revenue for their protection through uses such as tourism and collection of wild products in the zones with fewer restrictions. This additional income can, in turn, lead to more money to hire rangers, and better protection. For National Parks and Regional Landscape Parks that allow tourism and recreation, budgets can often support more rangers than in other types of PAs, making resource protection better. These four main types of PAs have administrations with appropriate staff, including rangers. Some other categories of protected areas, such as Nature Reserves (Zakazniks) have no administration, no budget, and no rangers. Protection is supposed to be provided by land users and local authorities. Most of these PAs really have no protection.

National forest lands have an important role in conserving biodiversity in the forested biogeographic regions of Ukraine. The total area of Ukrainian forest lands in the “Forest Fund,” managed by the State Agency of Forest Resources (SAFR) – formerly called the State Forestry Committee (SFC) – is around 7.5 million hectares. This represents about 70% of Ukraine’s forest lands, with the remainder under the control of other agencies, such as the Ministry of Agrarian Policy of Ukraine, Ministry of Defense, and Ministry of Emergencies and Affairs of Population Protection from the Consequences of Chernobyl Catastrophe, and MENR. Within the forests managed by SAFR, about 1.2 million hectares are set aside as forest protected areas, or about 15.4% of the Forest Fund lands as of January, 2011. These forest protected areas are part of the protected area system summarized in Table 5.1. They are, of course, a critical element of

biodiversity conservation in Ukraine. Issues related to forest management and biodiversity conservation are discussed in Section 4.0 of this report.

The percentage of land in Ukraine's protected area system is smaller than that in the majority of European countries, where the average is around 15%. The Government of Ukraine plans to expand the PA system more than two-fold, from the current 2.8 million hectares to over 6 million hectares, which would represent more than 10% of the national territory. Legislation listed earlier in this section, the National Program for Establishment of the Ecological Network in Ukraine in 2000 – 2015, and Action Program for Biodiversity Conservation and Protected Area Management in Ukraine through 2020, are the foundation for this expansion. The plan is to incorporate new lands identified as ecologically important based on scientific assessments carried out by a working group comprised of leading scientific institutes that was established in 2005. Selection of new protected areas is supposed to be based primarily on whether species listed in the Red Data Book of Ukraine, or other international lists of threatened species, are present.

Since the 2007 USAID FAA-119 Biodiversity Analysis was conducted, two major decrees concerning protected areas were issued by the President of Ukraine: "About measures of network of National Parks expansion" (2008); and "About additional measures of development of preservation in Ukraine (2009). The President also issued 44 Decrees by which PAs were expanded or created. A large new marine Zakaznik, "Filoforne Pole Zernova," of more than 4,000 km² was created in 2008 in the Bay of Odesa in the Black Sea to protect declining beds of the red alga *Phyllophora*.

http://maps.grida.no/go/graphic/reduction_of_the_zernov_s_phyllophora_fields_in_the_bay_of_odessa

Some international donors question the effectiveness of this plan for expansion without first strengthening the governance and financial sustainability of the current PA system: "However, the resources available through the Nature Reserve Fund are currently not adequate to facilitate this expansion....Expansion, though vital to ...biodiversity, is not realistic when the existing system remains under-funded and inefficiently administered." Furthermore, "The principal bottleneck is the capacity of PA institutions to put existing legislation and policies into action, especially when innovative approaches, permitted by the legal and policy framework, are considered... It can be argued that further improving the national legal and policy basis would add little practical value for the conservation prospects of biodiversity within the PA system." (GEF-UNDP, 2008)

As discussed in the next section, Ukraine has many protected areas registered through its participation in international agreements. The Primeval Beech Forests of the Carpathians is a UNESCO Nature World Heritage Site; there are six UNESCO Man and the Biosphere (MAB) Program Biosphere Reserves; and 33 Wetlands of International Importance registered under the Ramsar Convention.

5.4 TREATIES

Ukraine is a party to more than 40 international environmental treaties and conventions. <http://epl.org.ua/zakonodavstvo/mizhnarodne/> Treaties of greatest relevance to biodiversity conservation are:

- Convention on Biological Diversity (CBD)
- Convention on International Trade in Endangered Species (CITES)
- Ramsar Convention on Wetlands of International Importance
- Bonn Convention on Migratory Species (CMS)
- Bern Convention on the Conservation of European Wildlife and Natural Habitats
- Agreement on the Conservation of Populations of European Bats
- United Nations Framework Convention on Climate Change (UNFCCC)
- United Nations Convention to Combat Desertification (UNCCD)

The MENR is responsible for compliance with these conventions, and an informant from the MENR told us that he views these international conventions as having the force of Ukrainian law. Other international conventions are of course also relevant to addressing certain threats to Ukraine's biodiversity, such as those on Environmental Modification, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection, and Ship Pollution.

The CBD is of course a centerpiece of biodiversity conservation. Ukraine's Fourth National Report for the CBD was completed in 2009, available only in Russian. The Biodiversity Analysis Team reviewed this report, and found that it did not contain specific "actions needed" for biodiversity conservation in Ukraine.

Ukraine is a member of the UNESCO Man and the Biosphere Program, an intergovernmental scientific program, and is currently a member of its International Coordinating Council. Ukraine has six Biosphere Reserves registered with the MAB Program. <http://www.unesco.org/mabdb/br/brdir/europe-n/Ukrainemap.htm>: Shatsk, East Carpathians (a transboundary Biosphere Reserve shared with Poland and Slovakia), Carpathian, Danube Delta (shared with Romania), Chernomorskiy, and Askaniya-Nova. In 2008 countries of the Carpathian Convention signed a Protocol on biodiversity and landscapes conservation, which was ratified by Ukraine in 2009.

Ukraine has 33 Wetlands of International Importance registered under the Ramsar Convention, covering an area of around 700,000 hectares.

<http://blacksearegion.wetlands.org/OurWetlands/WetlandsoftheBlackSea/tabid/418/Default.aspx> Although Ukraine is party to the Ramsar Convention, in many cases the country's registered Ramsar sites are not included in the national PA system, and some do not have any protected status. This is an obvious gap in compliance with an international treaty to which Ukraine is a party. Thirteen additional important wetlands have been identified as prospective Ramsar sites. <http://wetlands.biomon.org/>

Ukraine also has four UNESCO World Heritage sites, one of which, the Primeval Beech Forests of the Carpathians, is a Nature World Heritage Site that was registered in 2007. Ukraine's three other World Heritage Sites are cultural sites. <http://whc.unesco.org/en/statesparties/ua>

Given the strong interest among NGOs and civil society organizations to participate more fully in decisions about environmental protection and biodiversity conservation, many of them see the UNECE Convention on Access to Information, Public Participation in Decision-making and

Access to Justice in Environmental Matters, usually known as the Aarhus Convention, as an important tool to press for more openness and information-sharing by the Ukrainian government, and in particular the MENR and SFC. Ukraine is a party to this convention. The Aarhus Convention grants the public rights regarding 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.” (Source: http://en.wikipedia.org/wiki/Aarhus_Convention viewed 4/6/11)

6.0 NGO AND DONOR PROGRAMS AND ACTIVITIES

6.1 NGOS

There are more than 500 environmental organizations in Ukraine, some of which are well established and advocate strongly for environmental protection. Perhaps this is what led the team that conducted the FAA-119 Biodiversity Analysis published in 2007 to conclude that “Environmental NGOs remain strong and committed in Ukraine and continue to make important contributions, based mainly on the funds of international donors.” According to the COP of the USAID UNITER project whom we interviewed for this analysis, environmental NGOs are among the strongest in the country, and environmental activists are well-connected to European networks. However, we found that although there may be environmental NGOs that can advocate strongly for environmental protection in general, and issues related to human health and safety in particular (such as control of air and water pollution), NGOs focused on biodiversity conservation are very limited in number, and operate with meager human and financial resources.

The two strongest of these today were also the two strongest identified in the 2007 Biodiversity Analysis, the National Ecological Center of Ukraine (NECU) and the Ukrainian Society for the Protection of Birds (USPB). Despite this finding, the Analysis Team was impressed with an array of energetic NGOs working on many issues of relevance to biodiversity conservation, including environmental education and environmental law. Many of these NGOs are strengthening their networks within Ukraine and with other regional and European NGOs, and taking advantage of new electronic networking tools to expand their effectiveness. We are hopeful that building the capacity of these NGOs can help to bring about some of the actions needed for conserving biodiversity in Ukraine. Below we briefly review the work of a number of Ukrainian NGOs contributing to biodiversity conservation:

EcoClub “Green Wave” <http://ecoclubua.com>

This NGO works on environmental protection and restoration, raising environmental awareness and enhancing environmental education of the general public, youth and children by information sharing, work with communities, and scientific research. Some of the projects are:

- “The Eco-trail: Building Public Awareness in Mizhrichensky Regional Landscape Park”
- Earth Day Celebration
- Corporate Social Responsibility initiative - Green8
- Leadership and Sustainable Communities

Ecopravo-Kyiv <http://www.accessinitiative.org/partner/ecopravo-kyiv>

Ecopravo-Kyiv is working with The Access Initiative to form a national coalition of CSOs and other stakeholders active in environmental rights and access issues to develop a national advocacy strategy for decision makers.

Environment People Law <http://epl.org.ua/>

This NGO works to protect environmental rights of citizens and organizations, to promote nature protection, environmental education, science and culture.

Green Dossier <http://dossier.org.ua>

Green Dossier is an information center whose objective is to educate people, especially youth, about humanities, environmental issues and sustainable development.

- One of Green Dossier's projects is working to establish a stakeholder consultation process and create a public dialogue around a national nature park.
<http://dossier.org.ua/project.php?id=26>
- A media initiatives project supports investigations by journalists on environmental issues, including on corruption and violation of laws concerning environment and nature conservation.
- Green Dossier is also working on a project on sustainable tourism in cooperation with All-Ukrainian Tourism Public Council.

Green World (Zelenyy Svit) <http://www.greenworld.org.ua>

The main objective of Green World is the conservation of the natural, historical, and cultural heritage of Ukraine. One of its main activities is to support the creation of the Dnister Canyon National Park by collaborating with local government, the MENR, scientists, and NGOs. This collaboration will help to determine which parts of the Dnister Canyon will be included in the park.

InterEcoCentre <http://www.geocities.ws/interecocentre/>

InterEcoCentre was established in 1994 as an NGO, with capabilities in project management, accounting, and environmental protection. InterEcoCentre has implemented a number of biodiversity conservation projects of the World Bank, including the Transcarpathian Biodiversity Project from 1993-1997, and Danube Delta Biodiversity Project from 1995-1999, and for Wetlands International, such as the Dnipro Corridor Project, signed in 2006.

National Ecological Center of Ukraine (NECU)

http://www.necu.org.ua/wp-content/uploads/booklet_necu_eng.pdf

The interests of the NECU are biodiversity conservation, biodiversity monitoring, development of the Ukrainian Ecological Network; establishment and management of protected areas; climate change mitigation; promotion of renewable energy; ecological education; publication of books and other materials on ecology and environmental conservation; and scientific support and implementation of public environment-protecting projects. NECU is a member of the IUCN. Projects and initiatives include:

- Save Ukrainian Steppe Initiative <http://pryroda.in.ua/step>,
- Development of the Desnyanskyy Ecocorridor of the National EcoNet (2010),
- School of Young Conservationists (2010),
- Inventory and monitoring of steppe ecosystems in Kyiv oblast (2008-2009),
- Development of a participatory approach in monitoring biodiversity (2007- ongoing)
<http://www.biomon.org/en/> .

Ukrainian Society for Nature Protection<http://www.ukrprroda.org/>

The Ukrainian Society for Nature Protection focuses on eco-education, the creation of a public environmental university and school for young ecologists, and the publication of a science journal and independent environmental newspaper. They are particularly interested in information networking, training for environmental literacy, nature protection activities, and environmental law. This is an old environmental NGO in Ukraine, and not currently as active as formerly.

Ukrainian Society for the Protection of Birds (USPB)

<http://www.birdlife.org.ua/eng/index.htm> This NGO is the partner of the international NGO Birdlife International in Ukraine. It works for the conservation of migratory and resident birds, monitors populations of threatened and endangered bird species, and advocates for habitat and environmental protection. USPB has a program to identify Important Bird Areas (IBAs) (http://www.birdlife.org.ua/eng/iba_prog.htm). There are now 166 recognized IBAs in Ukraine; the majority support significant numbers of waterfowl, many of European conservation concern, during breeding, wintering, or migration seasons. Projects of USPB include:

- Sustainable Integrated Land Use of Eurasian Steppe in Russia, Ukraine and Moldova. This project, funded by the European Union from 2007-2009, worked in Lugansk and Odesa oblasts, and had as its main task to test and implement mechanisms of steppe area management that would facilitate the development of rural areas on one hand and conservation of steppe ecosystem areas on the other hand. <http://www.steppe.org.ua/eng/about.php>
- The Steppe Biodiversity project, “Enhanced Economic and Legal Tools for Steppe Biodiversity Conservation and Climate Change Adaptation and Mitigation,” is funded by the European Union. USPB is the project leader, and its implementation partners include the Institute for Community Development (Ukraine); Rural Development Centre (Ukraine); Euroconsult Mott MacDonald (Netherlands); and European Centre for Nature Conservation (Netherlands). The focus is on protecting habitats, but the approach combines classic tools (protected area designation and management) and innovative approaches (development and marketing of carbon credits and renewable energy from grassland and agri-biomass). The three-year project aims to restore depleted or abandoned steppe lands in a sustainable way and to understand and prepare for climate change issues locally. The project runs from January 2011 to December 2013 <http://www.birdlife.org/eu/pdfs/BlenewsMarch.pdf>

International NGOs play an important role in biodiversity conservation in Ukraine. A few are described below:

Carpathian Ecoregion Initiative <http://www.carpates.org/>

An international coalition of NGOs and research institutes working towards a common vision for conservation and sustainable development in the Carpathians.

Carpathian Network of Protected Areas <http://www.carpathianparks.org>

The CNPA is a recently-founded international NGO focused on the transnational Carpathians region. The CNPA will coordinate projects designed to improve cooperation between the seven Carpathian countries, facilitate exchanges between the Carpathian protected areas, raise

awareness of the threatened ecosystems of the region, and develop a transboundary ecological network.

Wetlands International

<http://blacksearegion.wetlands.org/> <http://wetlands.biomon.org/>

Recent projects of the Black Sea Program of this International NGO include:

- “Integrating wetland biodiversity conservation with water and agricultural management in Ukraine,” a pilot project in the South Bug River Basin. The goal of this project is to develop the foundations for integrating wetland biodiversity conservation into water related sectoral policies in Ukraine based on ecological network development and civil society engagement in a pilot project.
- The “Black Sea Regional Initiative,” aims to enhance the conservation and sustainable development of the Black Sea coastal wetlands. It will establish the foundations for a regional wetlands initiative that will underpin future wetland conservation efforts.
- The “Dnipro river corridor in Ukraine” project will involve raising public awareness and promoting a participatory approach to biodiversity conservation and ecological network development. The project will work with governmental bodies, NGOs, and schools to contribute to the establishment of the Dnipro eco-corridor.

WWF http://wwf.panda.org/who_we_are/wwf_offices/ukraine/projects/

Through its Vienna-based Danube-Carpathian Regional Program Office, WWF has a number of active projects in Ukraine, linked with their regional initiatives. These include:

- Promotion of sustainable forestry practices through dissemination and use of the High Conservation Value Forests (HCVF) Toolkit, which is based on the principles of the Forest Stewardship Council (FSC).
- Assessment, improvement and continuous monitoring of protected area management effectiveness in the Carpathian Ecoregion. A Rapid Assessment and Prioritization of Protected Area Management in Ukraine have been conducted.
<http://wwf.panda.org/uk/?199300/Ex-asseessment-of-Ukr-protected-areas>
- A new tool, the Carpathian Protected Areas Management Effectiveness Tracking Tool (CPAMETT) <http://cpamett.natura2000.ro/>, based on the IUCN World Commission on Protected Areas (WCPA) Management Effectiveness Tracking Tool (METT) was translated into Ukrainian and is being disseminated in Ukrainian national parks.
- Development of the Carpathian Network of Protected Areas (CNPA), consisting of 19 biosphere reserves, 36 national parks, 51 nature parks and protected landscape areas, and around 200 other protected areas, many of which are in Ukraine.
- The WWF Danube Payment for Ecosystem Services Project introduces economic incentives to support land managers in the Lower Danube to sustain the ecosystem services provided by nature in the river basin. The project demonstrates how national and local-level payment schemes can work in Bulgaria and Romania. It integrates this novel approach into the Danube River Basin Management Plan and shares experience and learning with other countries in the Danube River basin, especially Serbia and Ukraine, as well as with other major river basins and the international community

http://wwf.panda.org/what_we_do/where_we_work/black_sea_basin/danube_carpathian/our_solutions/green_economy/pes/the_danube_pes_project/

- In addition to the lower Danube, WWF has been working in the Maramures Plateau and Ecedea Marshes in northern Romania to develop models of how PES could provide economic incentives for sustainable landscape management.

http://wwf.panda.org/what_we_do/where_we_work/black_sea_basin/danube_carpathian/our_solutions/green_economy/pes/the_danube_pes_project/model_areas/

National and international NGOs working on biodiversity conservation need local civil society partners in order to share information and work across scales. The recent Regulation of Cabinet of Ministers on Public Participation in Development of State Policy (November 2010) requires government agencies, including those dealing with protected areas and biodiversity conservation, to develop citizen advisory councils. Local NGOs represent local citizen stakeholders. In our visits to Donetsk and Lugansk oblasts, we heard about these citizen advisory councils from regional environmental managers. In Donetsk oblast we were told that 28 NGOs had registered for a meeting recently held at the State Department for Environmental Protection; in Lugansk we were told that 37 NGOs are invited for meetings and conferences on environmental issues.

6.2 DONORS

International donors, both bilateral and multilateral, have played a key role supporting improved environmental management and biodiversity conservation since Ukraine's independence. Many of the programs and projects of international NGOs summarized above, such as those of the Ukrainian Society for the Protection of Birds, Wetlands International, and WWF, have been funded by international donors. In the long run, however, biodiversity conservation in every country must be sustainably funded internally, by that country itself. All donors are wary of creating "donor dependence" through their assistance programs. An excellent example of a biodiversity conservation program that seeks to build capacity for national financing of biodiversity conservation is the GEF-UNDP "Strengthening Governance and Financial Sustainability of the National Protected Area System in Ukraine."

European Union

ENPI-FLEG Program www.enpi-fleg.org

The ENPI-FLEG Program, "Improving Forest Law Enforcement and Governance in the European Neighbourhood Policy East Countries and Russia" supports governments, civil society, and the private sector in participating countries in the development of sound and sustainable forest management practices, including reducing the incidence of illegal forestry activities. It is funded by the European Union, through the European Neighborhood Partnership Instrument (ENPI). The World Bank, IUCN, and WWF are partners in this program. FLEG is a 4-year, regional program, scheduled to end in 2012.

The implementation of the ENPI-FLEG Program in Ukraine is at two levels – national and regional. National actions include:

- Detection, classification and assessment of law enforcement problems;
- Analysis and improvement of forest and associated legislation;
- Enhancing information openness of state authorities; and

- Improving coordination of state authorities with NGOs and forest businesses.

Regional efforts have practical applications and are aimed at preparation and approval of modern methods and techniques for quality assessment and control over the movement of timber products, as well as prevention, detection and documentation of legal violations.

<http://www.enpi-fleg.org/index.php?id=18>

Steppe Biodiversity Project <http://www.steppe.org.ua/eng/index.php> www.steppe.org.ua

Implementation of this EU-funded regional project will be led in Ukraine by the Ukrainian Society for the Protection of Birds, and was described above under their NGO profile. The title of the project is “Enhanced Economic and Legal Tools for Steppe Biodiversity Conservation and Climate Change Adaptation and Mitigation.” It runs from January 2011 to December 2013.

Emerald Network Development Joint Programme

http://www.coe.int/t/dg4/cultureheritage/Nature/EcoNetworks/Presentation_en.asp

In this joint program the EU and Council of Europe intend to “substantially develop the Emerald Network in the seven following countries: Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine and the European part of the Russian Federation.” The objective of the program in Ukraine is to identify 80% of the Emerald Network potential sites at the end of 2011. The program runs from 2009-2011.

GEF

Since 1991, seven GEF biodiversity conservation projects have been approved in Ukraine, with a budget total of more than \$11 million in GEF grants and about \$31 million in co-financing.

<http://www.gefonline.org/projectListSQL.cfm>

The current GEF funding cycle, from July 2010 to June 2014, allocates almost \$27 million USD in Ukraine. The theme of Climate Change is supposed to receive the vast majority of that allocation, about \$22.5 million. The theme of Land Degradation will receive about \$3 million, and Biodiversity \$1.5 million. Much of the Biodiversity allocation will support the UNDP-implemented “Strengthening Governance and Financial Sustainability of the National Protected Area System in Ukraine” program (see UNDP below). According to the GEF representative interviewed by the Biodiversity Analysis Team in Washington, DC, Ukraine has not yet applied for the national proposal development process for the next GEF replenishment process, and therefore the GEF Secretariat does not know what Ukraine may be planning once the current funding cycle ends in 2014.

Netherlands Embassy

MATRA Program: Nature Conservation and Biodiversity

This small grants program provides funding for a range of projects. A sample of the 2010 projects include:

- Conservation of Dnister Wetlands Biodiversity through Strengthening Management and Public Participation,
- Male Podillya protection and conservation of biodiversity of the unique natural complex, located in Khmelnytsky oblast,
- Forming the Red Data Book Plant Conservation and Monitoring Network in Ukraine,
- The Eco-trail: Building Public Awareness (Chernigiv Region),

- Conservation of Biodiversity of the Dniester river basin in Carpathians,
- Educational Campaign “Ecological TV”, and
- Identifying and taking under protection the key breeding and wintering areas of bats of Zakarpattya.

The “Trans-boundary ecological connectivity in the Ukrainian Carpathians” project aims to establish corridors connecting Skolivski Beskydy National Park and Vyzhnytskyy National Park with protected areas in Poland and Romania. The experience of this pilot project will help the Ministry of Environmental Protection of Ukraine to develop technical planning tools, policies, and legislation to be applied at all levels for the development of Ukraine Ecological Network and develop connections with protected areas across international borders.

UNDP <http://www.undp.org.ua/en/projects-list-all>

The “Strengthening Governance and Financial Sustainability of the National Protected Area System in Ukraine” Project (<http://www.pzf.org.ua/eng/main.htm> or www.pzf.org.ua) is funded by the GEF and implemented by UNDP. The objective of the project is to enhance the financial sustainability and strengthen institutional capacity of the PA system in Ukraine. The four-year project, 2008-2012, has a budget of \$5.8 million USD. The government partner in the project is the State Service for Protected Areas of the MENR. Three PAs (Shatsk and Pripyat-Stokhid National Nature Parks and Pripjat-Stokhid Regional Landscape Park) were selected as pilot sites to validate the project’s methodologies. Main outputs of the project are expected to be

Financial sustainability:

- development of a comprehensive national strategy for PA financing,
- introduction of business planning as a standard practice in PAs, and
- testing private-public sector partnerships as a model for maximizing and sharing revenues from activities such as tourism, and engaging local people in conservation activities such as hay-cutting.

Improved governance of the national PA system:

- testing decentralized governance systems for PAs,
- providing for obligatory staff training in PA management,
- establishing an association of PAs, and
- introducing a system to monitor management effectiveness as a feed-in to decision making processes.

The Dnipro Basin Environment Programme

www.undp-gef-dnipro.com

Funded by the GEF and implemented by UNDP, this program aims to develop and implement mechanisms for improving the ecological condition of the Dnipro River. The project is now in its second stage: the implementation of a strategic action plan. The immediate outcome of the project will be a series of demonstrable examples of reduction of specific persistent toxic substances through the development of cleaner technologies. The long term expected outcome anticipates a significant reduction in wastewater discharge into the Dnipro River and its tributaries with immediate benefits for the Black Sea.

7.0 ACTIONS NEEDED TO CONSERVE BIODIVERSITY

The language of FAA Section 119(d) calls for a Biodiversity Analysis to identify “the actions necessary in that country to conserve biological diversity.” These “actions necessary” are actions that will address and reduce the causes of threats, which were discussed in Section 4 of this report. These actions will thus include, in general, actions to address the social causes; political, institutional, and governance causes; and the economic causes. Following the logical framework for this Biodiversity Analysis we therefore group the needed actions under these three general themes in sections 7.2, 7.3, and 7.4 below.

7.1 ACTIONS NEEDED AS IDENTIFIED BY THE GOVERNMENT OF UKRAINE

The Analysis Team took as our starting point Ukraine’s own official view of what actions they consider necessary to conserve biodiversity in the country. In seeking to understand this view, the Team first reviewed Ukraine’s *Fourth National Report to the Convention on Biological Diversity*, released in 2010, and available only in Russian, <http://www.cbd.int/doc/world/ua/ua-nr-04-ru.pdf>. This report did not contain an action-oriented list of conservation needs. The CBD Secretariat is now recommending that parties to the Convention prepare fifth national reports, due in March 2014, and develop and update their National Biodiversity Strategy and Action Plan.

Next, the Team reviewed the *Strategy for the National Environmental Policy of Ukraine to 2020*, in Ukrainian. This strategy was adopted on December, 21, 2010, by the Verkhovna Rada, and has been signed by the President of Ukraine. Like the CBD Fourth National Report, this was more of a strategic than action-oriented document, laying out general principles rather than providing a list of actions needed. However, the *National Action Plan for Environmental Protection in Ukraine for 2011-2015*, developed during the last half of 2010 for implementing the above Strategy, contains a summary of perceived biodiversity conservation needs that remain unaddressed by either the GOU or local or international NGOs or other donors in Ukraine. In other words, these are the “actions needed,” from the perspective of the GOU and its civil society partners, to conserve Ukraine’s biodiversity (Box 7.1). This document was translated from Ukrainian by the team, and those actions relevant to biodiversity conservation were identified from the much longer list of actions needed for environmental protection in general. This list is given below. We have retained the general headings used in the National Action Plan (such as “Public Information and Awareness” and “Environmental Conservation”), and retained the same numbers used for specific actions used in the Ukrainian list. However, we have grouped specific actions by theme, re-ordering the numbering in some cases, in order to understand and analyze them more efficiently. Numbers missing from the list below indicate that the action listed in the Action Plan was not directly relevant to biodiversity conservation. As discussed in Section 5.1, although these points came from what was called an “Action Plan,” it should be noted that these are not really “planned actions,” but rather a list of unaddressed “actions needed.”

Box 7.1. Conservation from the *National Action Plan for Environmental Protection in Ukraine, 2011-2015.* (translated A. Tarasova, edited by B. Byers)

1.0 Public Information and Awareness (13 “actions needed” were listed in the Action Plan, grouped below by theme)

Public Access to Environmental Information

1.1 Develop a national environmental information system according to EU standards by 2020. (to include a national database of natural resources, and a database on amounts and sources of pollution).

1.2 Increase environmental information and environmental social marketing through the media by 15% by 2015 and by 30% by 2020

1.9 Make information from government agencies responsible for environmental protection publically available through official websites and the media.

1.10 Develop a program for public access to ecological information and for public participation in environmental decision-making, in accordance with the Aarhus Convention, by 2012, and implement it by 2015.

Capacity of Environmental NGOs

1.4 Support projects of environmental NGOs with government funds, increasing their funding to 3% of the budget of the State Fund for Nature Protection by 2020.

1.11 NGOs conduct a public assessment of national environmental policy and produce a report, to be published and disseminated with support from the MENR.

Environmental and Biodiversity Education

1.5 Develop a strategy for environmental education for sustainable social and economic development by 2015.

1.6 Implement a program of environmental education for government employees that work on environmental issues by 2015.

1.7 Establish a network of regional (oblast level) ecological education centers based in established educational institutions and/or NGOs by 2015.

1.8 Implement a program of environmental education for the general public at national, regional, and local levels.

1.13 Develop agricultural experiment stations and extension services in every oblast to develop and teach practices for sustainable, environmentally-friendly agriculture to local farmers, and transfer appropriate technologies.

Agriculture

1.15 Introduce ecological and environmental education at the national, regional (oblast), and local level.

Public Participation in Environmental Management

1.12 Develop mechanisms and procedures for public input into environmental decision-making and enforcement, including public participation in Environmental Impact Assessments and other environmental planning procedures.

National Environmental Policy

2.0 Environmental Conservation (4 “actions needed” were listed in the Action Plan, grouped below by theme)

Conservation of Lands and Soils

2.8 Decrease the area of plowed land in Ukraine by 5-10% by 2020 through a program to remove from lands from crop production that are on slopes greater than 3%, in watershed zones, or that are eroded or polluted, and restoration of natural, native vegetation on these areas.

2.9 Develop procedures to incorporate environmental protection requirements in any decisions that involve the transfer or change of land use designation (for construction, industry, energy, transportation, etc.) by 2015.

2.10 Develop and introduce by 2020 a system of management of agrarian landscapes to restore the environment and create an ecological network that will conserve biotic and landscape diversity.

Conservation of Forests

2.11 Increase the area of forest cover in Ukraine to 17% by 2020 (compared to 13-14% now) by reforestation and afforestation of Forest Fund lands and new forest shelterbelts, except on areas of remaining steppe vegetation.

4.0 National Environmental Policy (3 “actions needed” were listed in the Action Plan)

4.3 Involve all economic and social sectors and stakeholders in developing and implementing a framework national environmental policy, “Environment for Ukraine.” National Development Policy

4.6 Develop a clean production strategy and action plan for Ukraine by 2015. Energy Sector

4.13 Create the enabling conditions for widespread adoption of organic and ecologically-friendly agricultural practices by 2020.

5.0 Biodiversity Conservation (7 “actions needed” were listed in the Action Plan)

5.1 Develop a national program to track and control the introduction of non-native invasive species (terrestrial, aquatic, and marine).

5.2 Pass legislation to control domestic and international trade of endangered species by 2015. **5.3** Implement a national campaign to educate the public and decision-makers about the importance of ecosystem services, and conduct assessments of their economic value throughout Ukraine, by 2015

5.4 a. Designate habitats to be managed as buffer zones around protected areas, and corridors linking them, so as to form an “Ecological Network” that, together with the protected areas themselves, would cover 41% of Ukraine by 2015. b. Increase the area of protected areas governed by the Nature Protection Fund to 10% of Ukraine by 2015, and 15% by 2020.

5.5 Incorporate an “ecosystem approach” to environmental management into Ukrainian legislation and management policies and practices in accordance with the European Union by 2020.

5.6 Develop a program of ex-situ conservation, captive breeding, and reintroduction to the wild for rare and endangered species.

5.7 Develop financial mechanisms and incentives for biodiversity conservation based on an economic assessment of the economic value of biodiversity, and including economic analysis of the financial sustainability of protected areas and development of mechanism to make them financially sustainable.

7.2 ACTIONS NEEDED AS IDENTIFIED BY THE BIODIVERSITY ANALYSIS TEAM

The following summary of biodiversity conservation needs that remain unaddressed by either the GOU or local or international NGOs or other donors in Ukraine is based on the analysis of all information gathered by the Analysis Team. The sections below summarize “the actions necessary in that country [Ukraine] to conserve biological diversity,” as required by FAA Section 119 (d) (1).

7.2.1 SOCIAL ACTIONS

Social actions address the social causes of threats to biodiversity, such as the lack of awareness and knowledge among the general public, and lack of social and cultural concepts of nature conservation, and lack of educational and social marketing mechanisms to change these things. Actions needed include:

- NGOs, the media, and government agencies at all levels need to engage in increased media coverage and social marketing campaigns to increase awareness and knowledge of threats to biodiversity and the values and benefits of biodiversity among the general public and government officials.

- NGOs, the media, and government agencies at all levels need to develop educational materials in a diverse range of media (popular books, textbooks, radio, TV, film, internet media, magazines, newspapers) to increase awareness and knowledge of the diversity of values and benefits of biodiversity (products, ecosystem services, and non-material benefits) and about threats to biodiversity and the need and methods for its conservation.
- NGOs and government agencies at all levels need to develop a public constituency for protected areas and biodiversity conservation through greater opportunities for outdoor, nature-based education, sustainable tourism and recreation.

One of the main challenges faced in Ukraine is that the traditional perspective on biodiversity conservation (perhaps dating from the Soviet era) is one of “nature protection.” That is, biodiversity is seen as something to be “protected” from humans, in certain restricted places, rather than “conserved” in multiple-use landscapes, where it can be used and managed in a sustainable manner for various human benefits (products, services, and non-material values). In fact, the Team found that the word “conservation” does not have an equivalent in Ukrainian, suggesting perhaps that the very concept of conservation is not common, at best. There has been, apparently, no equivalent in Ukraine of John Muir, one of the founders of nature conservation in the US, who has extolled the aesthetic, spiritual, and recreational virtues of wild nature. Nor do there seem to be, in Ukraine, NGOs that are equivalent to the Sierra Club or Wilderness Society in the US, which can take that theme to civil society and create a broad constituency for conservation. Although Ukraine has a rich history of conservation, its foundation was the creation of strict protected areas for scientific use. As discussed in Section 5, more than a quarter of the area covered by national-level PAs are Zapovedniks, strictly protected areas that are not open to the public, but generally open only to scientists. While strict nature preserves may foster a small, and often very dedicated, constituency of scientific researchers, they do not lend themselves to developing a broader public constituency for biodiversity conservation.



Park Director of Mizhrichensky Regional Landscape Park briefing volunteers with the EcoClub “Green Wave.” Photo by B. Byers, March 2011

In this context, the work of young volunteers on the construction of basic infrastructure for nature education and tourism in Mizhrichensky Regional Landscape Park near Kyiv that was observed by the Analysis Team can be seen as a very positive, hopeful example. This activity was organized by the NGO Eco-Club “Green Wave,” and we believe it represents a practical example of the type of actions that will be needed to build a significant public constituency for the conservation of multiple-use protected areas in Ukraine.

7.2.2 POLITICAL, INSTITUTIONAL, AND GOVERNANCE ACTIONS

As described in Section 4, the largest number of specific causes of biodiversity threats are due to political, institutional, and governance issues, so it should come as no surprise that the majority

of “actions necessary” address such causes. The actions listed below are by no means an exhaustive list, but represent those found to be most important in this analysis. Many of these actions would have to be carried out by the Government of Ukraine, or regional and local governments; some could be carried out by NGOs (local, national, or international), and some by international donors or the private sector. Actions needed include:

- International and national NGOs and/or international donors should develop and implement training programs to strengthen capacity of NGOs that focus on biodiversity conservation in areas such as organizational development; fundraising and financial management; and outreach, communications, and advocacy.
- Government of Ukraine needs to provide adequate staff and resources to MENR agencies, and the Academy of Sciences, to effectively carry out the responsibilities for biodiversity monitoring, management, conservation, and enforcement with which they are charged by national law, and by Ukraine’s participation in international treaties (CBD, CITES, the Bonn Convention, etc.).
- Government of Ukraine and NGOs need to conduct a national assessment of the impact and threat of climate change to the biodiversity of Ukraine, which at present is completely lacking.
- Government of Ukraine needs to develop and implement a comprehensive policy and legislation regarding non-native invasive species.
- Government of Ukraine needs to reform forest policy, law, and forestry practices to recognize the value of forest biodiversity and conserve it; much larger areas of mature, old-growth forest should be protected, and natural regeneration should be practiced on much larger areas than at present.
- Government of Ukraine needs to reform agricultural policy, law, and practices to recognize the value of biodiversity and conserve it; this is especially critical in steppe and forest-steppe zones.
- Government of Ukraine needs to reform water policy, law, and practices to recognize the value of aquatic biodiversity and conserve it.
- Government of Ukraine needs to reform fisheries policy, law, and practices to recognize the value of freshwater and marine biodiversity and conserve it.
- Government of Ukraine needs to develop mechanisms for increased public participation in environmental planning and decision making; NGOs need to advocate for such mechanisms.
- Government of Ukraine needs to make more environmental and biodiversity information that it holds available to NGOs and the public, including in electronic form and accessible online.
- Government of Ukraine needs legislation to protect endangered species outside of protected areas.
- NGOs need to develop a national network or coalition/clearinghouse of NGOs focused on biodiversity conservation.
- Government of Ukraine agencies and/or regional governments need to develop sustainable management plans for the harvesting/hunting/fishing of commercially and/or recreationally valuable species, and enforce hunting and fishing laws.

- National or regional government energy policies or laws concerning or promoting unconventional (e.g. shale gas) or renewable (e.g., wind, hydro, solar, biomass) energy sources need biodiversity safeguards
- Academic and research institutions and Government of Ukraine need to develop mechanisms for more effective interaction between scientists and policy- and decision-makers, to realize “applied biodiversity conservation science” and “science-based management” of Ukraine’s living natural resources.
- Government of Ukraine needs to develop and implement an ongoing national training program (in planning, management, financing, enforcement) for managers and staff of protected areas; this training should also be available to, or replicated at, the oblast level, for the managers of regional protected areas.
- Academic and research institutions need to develop Conservation Science Programs to train a new generation of scientists, managers, and educators in modern, interdisciplinary biodiversity conservation.
- Academic and research institutions need education and training to bring a new perspective on forest management, especially multiple-use concepts including biodiversity conservation, to the forestry sector in Ukraine
- Government of Ukraine, NGOs, and the private sector need to develop and implement policies, laws, standards, and practices for ecologically- and socially-sustainable tourism, “ecotourism,” in order to prevent further degradation of natural areas from recreational development and visitor impacts.
- GOU and NGOs need improved GIS capabilities for mapping ecosystems, species distribution, and especially distributions of rare, threatened and endangered species.
- GOU needs to strengthen the capacity (staff, training, financial resources, equipment) of the State Ecological Inspection Service to monitor and enforce all laws concerning protected areas and biodiversity conservation.

A key point regarding the list above is that although most of the “actions needed” are the responsibility of the Government of Ukraine, the Analysis Team believes that few of them can be realized unless there is a political constituency for them. Such a political constituency is needed to create the demand for these actions by the government to conserve biodiversity, and thus the political will on the part of lawmakers and government officials to carry them out. Such a constituency, as described under the social actions needed above, is currently weak- thus “demand” from civil society for biodiversity conservation is relatively weak. Building capacity at the oblast and even more local level is critical. Stronger capacity of NGOs to raise awareness and knowledge, build a conservation constituency, and advocate for conservation is needed. Thus, there is a conundrum of the “which came first, the chicken or the egg” sort at work here. Although our analysis identified a much longer list of “actions needed” by the government than by civil society, the private sector, or donors, in the long run we believe that among the highest priorities is building the capacity of NGOs to educate the public and advocate for the changes needed from the government.

In this context, the work of an NGO-led campaign – “Save Ukrainian Steppes!” – provides an instructive and hopeful model of how NGOs, working between the national and local level, can provide access to critical information, build constituencies, and put pressure on the government to change its policies and practices. This “civic initiative for steppe conservation” began in 2009



Analysis Team members visiting an overgrazed area of Naholny Kryazh steppe, Donetsk Oblast. Photo by B. Byers, March 2011.

and is led by the National Ecological Center of Ukraine (NECU), in association with a regional NGO from Zaporizka oblast, “Association of Friends of Nature.” The initiative is currently working on an inventory of steppe areas of Ukraine, and has found many important fragments of steppe that are not currently under any form of protection. The Biodiversity Analysis Team visited an unprotected steppe fragment at Naholny Kryazh in Donetsk oblast, with a scientist from NECU and the “Save Ukrainian Steppes” initiative. Parts of this steppe area are badly degraded from overgrazing by sheep. Other nearby areas are in good condition and rich in Red Data Book species.

7.2.3 ECONOMIC ACTIONS

The economic causes described in Section 4 are extremely important and powerful drivers of a number of the threats to Ukraine’s biodiversity, from habitat conversion of steppe, to forestry practices that threaten forest biodiversity, and illegal overharvesting of high-value species such as sturgeon. Actions needed include:

- National and local governments, NGOs, and the private sector need to develop and implement programs to promote sustainable nature-based tourism and recreation (“ecotourism”) in and around protected areas of diverse types. Training programs are needed for small business owners involved in outdoor recreation, nature guiding, nature tourism, and standards and certification are needed to prevent harm to biodiversity from recreational development.
- National and local governments, NGOs, and the private sector need to develop and implement programs to promote sustainable harvesting of medicinal plants, NTFPs, and fish, and link these with increased economic opportunities and competitiveness within European and global markets.
- National and regional governments need to develop and implement programs of economic incentives and disincentives for conservation of steppe vegetation (such as conservation bank programs, enforcement and collection of fines for illegal grazing or mining) at the national and regional level, and to explore Payments for Ecosystem Services mechanisms in steppe regions, especially for water and soil erosion.
- SAFR and NGOs, supported by donors and public-private partnerships, need to continue to promote and expand the use of the High Conservation Value Forests Toolkit and FSC

standards and certification in the forestry sector, and link this with increased economic competitiveness in EU and global markets; strengthen public-private partnerships to promote sustainable forestry.

- Government and NGOs need to conduct studies of the economic value and potential of ecosystem services (such as hydrological/watershed services, nutrient cycling, carbon sequestration, natural pest control, pollination) at the national and oblast/regional level. There is a need to raise awareness among decision makers and the public of the concept of ecosystem services, and the need to develop a pilot project or projects on ecosystem services at the regional (oblast by oblast) level.
- Government of Ukraine and regional governments need to continue the development of business plans for all PAs at the national level begun by the GEF-UNDP program that ends in 2012, and continue to develop strategies and plans for adequate and sustainable financing of biodiversity conservation.

In this context, positive initial steps toward one of the actions needed above can be found in the Ukraine National Forest Stewardship Council Initiative. This initiative, begun by forest scientists at the National Agrarian University of Ukraine in 2002, is working to become an independent NGO. Funding from the World Bank and WWF assisted this process of bringing FSC standards and certification into the Ukrainian forestry sector. Such standards and certification will be needed if Ukrainian timber and wood products are going to comply with a new EU law on trade in legal and sustainable forest products, and therefore be allowed into the EU market. They have developed demonstration sites in different forest regions, where they are trying to demonstrate “ecologically-sound” and biodiversity-conserving forestry; trying to demonstrate that multiple use management is possible, to find a balance, and a consensus, between total conservation and total exploitation. This also involves (per FSC certification principles) informing local communities of their rights, strengthening their participation in forest decision-making, and advocating for the reform of “on the ground” forest management practices to make them more open and transparent.

Part of the process of FSC certification involves preventing the logging of High Conservation Value Forests, and a Toolkit for identifying such areas has been developed through a collaboration with WWF and a public-private partnership with the Swedish furniture giant IKEA.

Cover of Publication “High Conservation Value Forests Toolkit for Ukraine”

Співробітництво WWF та ІКЕА з лісових проєктів.
Партнерство для сприяння лісовому господарству, що викликає довіру
Особливо цінні для збереження ліси:
визначення та господарювання.
(Практичний посібник для України).
High Conservation Value Forests Toolkit.
A practical Guide for Ukraine
Друга редакція
(потребує ретельної перевірки і доопрацювання)
20 червня 2008

7.3 COSTS OF ADDRESSING ACTIONS NEEDED

Our SOW requested that the Analysis Team estimate the “annual level of efforts required to address those needs” identified in this analysis, and we received clarification that this referred to the cost or funding level required. It should be noted that an estimate of costs is not a legal requirement of FAA Section 119 Biodiversity Analysis. In order to provide this estimate, we utilized the best available data on one aspect of conserving biodiversity in Ukraine, the annual cost of operating the PA system, taken from the Project Document for the GEF-UNDP “Strengthening Governance and Financial Sustainability of the National Protected Area System in Ukraine” Project (GEF-UNDP, 2008). According to their financial analysis, in 2008 the annual cost of operating the PA system was about \$4.8 million per year, which covered only 60% of what was needed to properly implement PA management plans. Thus, it is estimated that approximately \$8 million per year was needed in 2008, before the recent rapid expansion of the PA system.

Effective protected areas are only one component the actions needed to conserve biodiversity, and government actions are only one component of all conservation actions needed. Thus, total conservation costs could be roughly estimated to be several times greater than the cost of maintaining an effective PA system.

To provide another, independent estimate of the cost of effectively managing the PA system of Ukraine, we used estimates of effective PA management obtained from a global study of terrestrial conservation costs and unmet needs (Balmford, et al., 2003. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC298723/>). Using a figure on the low end of globally-reported costs, \$1,000 per km² per year, and multiplying by the area of the current Ukraine PA system (see Table 5.1) of 3,745,000 ha (37,450 km²) gives an estimated annual cost of around \$37 million per year.

Should the Government of Ukraine, or some other stakeholder, wish to undertake a quantitative financial analysis of its PA system and determine a funding level necessary for effective management of the PA system, a UNDP-developed “Financial Sustainability Scorecard for National Systems of Protected Areas” is one tool that could be used (Bovarnik, 2007. <http://www.unpei.org/PDF/ecosystems-economicanalysis/Financial-Sustainability-Scorecard-PA.pdf>).

Although total costs for meeting the current unmet needs for biodiversity conservation in Ukraine may be huge, the Analysis Team believes that if USAID chose to focus and target a fraction of the budgets of some of its current and planned projects on a few of the unaddressed biodiversity conservation needs related to those project’s objectives, it could make a significant contribution for a relatively small level of investment. These opportunities are discussed in Report 2.

ANNEX A: REFERENCES AND WEBSITES CONSULTED

Government of Ukraine (listed by title)

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Parnikoza I.Yu., and Vasiluk O.V. 2010. Ukrainian Steppes: Current State and Prospects for Preservation. National ecological center of Ukraine, a/b 89, Kyiv-25, Ukraine, 01025 <http://pryroda.in.ua/step/doslidzhennya-rozrobki-sposterezhennya/ukrainian-steppes-current-state-and-perspectives-for-safe/>

Prydatko, Vasyl, Yulia Apetova, and Stefanie Aschmann. 2004. Biodiversity and Agriculture in Ukraine (BINU) Project, Ukrainian Land and Resource Management Center. http://www.ulrmc.org.ua/services/binu/prmaterials/Biodiversity_Agriculture.pdf

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ANNEX B: BIOGRAPHICAL SKETCHES OF THE ANALYSIS TEAM

Chief of Party – Bruce Byers is a biodiversity conservation and natural resources management specialist with more than 25 years of experience in this field. His work combines an academic background in ecology and conservation biology with extensive practical experience in both applied ecology and social sciences. Bruce has had extensive field experience in Asia, Africa, Europe, and Latin America; he has worked professionally in more than 30 countries. Bruce has served as team leader for six major evaluations, assessments, and strategic planning exercises for USAID and international NGOs, and served as a team member on many other assessment or evaluation teams, including the *FAA Section 119 Biodiversity Analysis for Serbia and Montenegro* in 2002. He was the lead consultant and author of the 2005 USAID publication *Tropical Forestry and Biodiversity (FAA 118 and 119) Analyses: Lessons Learned from Recent USAID Experience and Guidelines for USAID Staff*, which was based on a review of more than 30 USAID FAA 119, FAA 118/119, and ETOA reports. In 2008, he led the final evaluation of the USAID Global Conservation Program.

Biodiversity Specialist – Galyna Karpova is a biodiversity conservation expert with over 25 years of experience in plant ecology, aquatic ecology, floodplain conservation and restoration, and environmental education. As a senior researcher at the Institute for Hydrobiology of Ukraine, she investigates the ecological status of Ukrainian rivers and the biodiversity of aquatic ecosystems. Dr. Karpova is also a program director at the Institute of Ecology, where she leads environmental education projects, including developing and publishing environmental education materials for schools of the Danube River, Dnipro River, Black Sea Coastal Region, Carpathian Region, and the Polissya Region of Ukraine, Belarus and Russia. Dr. Karpova has recently worked on a project supported by the US Embassy to increase awareness among local communities concerning environmental quality of their local areas, and an IUCN project on conservation in agricultural areas. She is fluent in Russian and Ukrainian and has a professional working knowledge of English.

Conservation Science and Policy Expert – Olena Tarasova is a conservation science and policy expert with experience in mapping and monitoring of biodiversity in numerous protected areas of Ukraine, and in engaging the public on environmental and biodiversity conservation issues. She holds an M.Sc. in Conservation Science from Imperial College, London and a second M.Sc. in Environmental Science and Policy from the National University of “Kiev-Mohyla Academy,” where she is currently a part-time lecturer on environmental topics. She has contributed to numerous research expeditions to National Parks and Reserves (including Desnyansko-Starogutskyy National Park, Cape Chauda, Kerchenskiy, Gorgany Natural Reserve, and the Karadag Natural Reserve) to perform data collection, monitoring of important bird areas, and analysis of environmental threats and opportunities. Ms. Tarasova has a strong background in public engagement, and has organized numerous forums and events for public participation and dissemination of environmental knowledge. She is a founder and project coordinator of the NGO EcoClub “Green Wave.” Ms. Tarasova is fluent in Ukrainian, Russian and English.

ANNEX C: STATEMENT OF WORK

UKRAINE FAA 119 BIODIVERSITY ANALYSIS

C.1 BACKGROUND

The purpose of this task is to conduct a country biodiversity analysis for Ukraine. This analysis will respond to the requirements of Section 119(d) of the Foreign Assistance Act of 1961 (as amended (FAA)) and ADS 201.3.9.2 regarding biodiversity analyses for country-level long term plans. The analysis is intended to assist USAID Regional Mission for Ukraine, Moldova and Belarus (the Mission) during the upcoming strategic planning process to report on actions necessary to conserve biodiversity in Ukraine and the extent to which actions proposed in the draft Ukraine Country Development Cooperation Strategy (CDCS) meet the needs thus identified.

C.2 SCOPE OF WORK

The Contractor shall conduct a thorough analysis of the biological diversity in Ukraine and prepare the following reports:

- (1) Ukraine: FAA119 Biodiversity Analysis: Actions Necessary for Conservation, and
- (2) USAID/Ukraine: Meeting Biodiversity Conservation Needs in 2011-2016.

When planning and conducting the assessment, the Contractor shall make every effort to reflect opinions and recommendations of all key stakeholders from the national and local governments, donors, civil society, and the private sector. In particular, the Contractor should arrange meetings with USAID Europe & Eurasia (E&E) Bureau Environmental Officer (the EE/BEO) and other relevant USAID/Washington officers, and, if applicable, the USFS, USGS, World Bank, and other organizations in Washington DC to ensure a clear understanding of this contract and the expectations of the EE/BEO.

The Contractor's personnel working on this task order is expected to be familiar with regional European Union frameworks and policies that are applicable to biodiversity, water resources, and forests that might impact Ukraine presently or in the future. It is also encouraged to review the documents describing USAID activities in Ukraine located at <http://ukraine.usaid.gov/programs.shtml>, as well as the current Mission strategy and two Ukraine biodiversity assessment reports prepared in 2001 and 2006 located at <http://ukraine.usaid.gov/arc.shtml>.

The Contractor is encouraged to do site visits to protected areas to supplement understanding of biodiversity issues that arise in interviews and/or literature and/or past Ukraine biodiversity assessment reports. The Contractor shall be aware of the potential for raising expectations when contacting stakeholders and the need to correctly describe the purpose of the assessment.

C.3 KEY PERSONNEL REQUIREMENTS

The Contractor is expected to assign a Chief of Party, a senior biodiversity specialist with experience conducting USAID FAA 119 assessments, and at least one Ukrainian biodiversity specialist with detailed knowledge of local ecosystems and relevant stakeholders.

The COP shall have experience in successful conduct of at least five biodiversity assessments of similar or bigger/higher size, scope, and/or complexity in the last 10 years. Prior experience in conducting successfully similar assessments in Eastern Europe or the Former Soviet Union countries is preferred. The COP must possess at least a Masters graduate degree in relevant disciplines and a good knowledge of regional ecosystems and relevant governmental and non-governmental institutions. The COP shall be able to think systemically and creatively and to suggest catalytic approaches to intervening. The COP shall have excellent intercultural communication skills and ability to quickly establish effective communication with relevant government officials, NGO leaders, and international donors. The COP must have outstanding English communication skills, both written and oral; fluency in Ukrainian or Russian is preferred.

Ukrainian biodiversity specialist shall have excellent knowledge of Ukrainian ecosystems and relevant governmental and non-governmental institutions and at least a graduate degree in relevant disciplines. Ukrainian biodiversity specialist must have 10 or more years of relevant professional experience; prior experience in conducting successfully similar assessments in the Former Soviet Union countries or Eastern Europe is preferred. Ukrainian biodiversity specialist shall have strong oral and written communication skills and professional level fluency in Ukrainian or Russian; professional level fluency in English is preferred.

References provided and information obtained from other sources shall reveal strong past performance in relevant areas of the project.

C.4 RELATIONSHIP TO USAID/UKRAINE STAFF

A Task Order Contracting Officer Technical Representative (TO COTR) will be assigned to liaise with the Contractor to provide the technical and administrative guidance required under this task order. The Contractor will be notified about the assigned staff in writing. The Contractor is encouraged to discuss all essential task activities and deliverables with the TO COTR.

The Contractor will be responsible for all logistical support of the assessment and shall not expect any substantial involvement on the Mission staff in either planning or conducting the assessment.

The Contractor shall inform the Mission of all scheduled meetings and potential field visits in advance and will invite the Mission staff to participate in those meetings and site visits. The Contractor will provide a draft assessment schedule to the TO COTR five working days before the start of any assessment activities and be prepared to make reasonable changes to the assessment schedule on Mission's request.

After completion of the assessment and prior to departure from post, the Contractor’s personnel will brief the relevant USAID Mission officials on the principal activities, accomplishments, findings, and lessons learned during the assignment.

The Contractor is encouraged to share draft reports with the TO COTR prior to submitting the final reports; the Contractor will reserve at least five business days for USAID (TO COTR and the EE/BEO) to review and provide comments on each draft report. The Contractor will use either cover letters or similar documents to explain how comments provided by the Mission and the EE/BEO were addressed in the final versions of the reports, if those versions differ substantially from the reviewed ones.

C.5 DELIVERABLES

<p><i>Ukraine: FAA119 Biodiversity Analysis: Actions Needed for Conservation <u>Final</u> Report</i></p>	<p>The Contractor will deliver the final version of <i>Ukraine: FAA119 Biodiversity Analysis: Actions Needed for Conservation</i> report in both electronic (MS Word format) and paper form (3 copies) to the TO COTR by April 26, 2011.</p>
<p><i>USAID/Ukraine: Meeting Biodiversity Conservation Needs in 2011-2016 <u>Final</u> Report</i></p>	<p>The Contractor will deliver the final version of <i>USAID/Ukraine: Meeting Biodiversity Conservation Needs in 2011-2016</i> report in both electronic (MS Word format) and paper form (3 copies) to the TO COTR five weeks after receipt of a draft Ukraine CDCS document from the Mission¹.</p>

Report 1 - Ukraine: FAA119 Biodiversity Analysis: Actions Needed for Conservation – will include the following information:

- A. General overview of information available on the status of biological diversity in Ukraine, sources of information and links to the most relevant Internet pages, and possible information gaps.
- B. Descriptions and status of major natural ecosystems; the unique aspects of Ukraine’s biodiversity, including specific and endemic plants and animal species, condition of the areas with special status (protected areas); identification of the value of biodiversity to local populace as well as national and global commons; an updated list or maps (if available) of all protected national parks, forest resources, animal sanctuaries, wildlife refuges, and other protected areas as well as a brief description of each of the protected areas with highlighted specificities; a list of potential protected areas and selection criteria used for identifying those areas; an updated list of all IUCN classified endangered and rare species found in the country; a map (if available) identifying their habitats.
- C. Description of current and potential principal threats to biodiversity in Ukraine whether they are related to human acts, ecological causes, natural diseases, the lack of legislation or protection or any other causes; identification of the causal factors/root causes of the threats

¹ Draft Ukraine CDCS may become available to the Contractor in mid-April 2011.

to biodiversity; description of the major issues and needs identified during the analysis that require immediate attention in order to improve the protection of biodiversity.

- D. Description of the current policy framework of the Government of Ukraine (GOU) in the environmental sector; the perceived GOU interest in and commitment to protecting Ukraine's natural resources; a national strategy (if any) related to the protection and management of biological resources; a list of current legislation related to the environment and biodiversity, including laws and regulations related to the protection and management of biological resources and endangered species; a list of the international treaties signed and ratified, as well as those that need to be signed and ratified in the near future in order to conserve and manage Ukraine's biological resources more efficiently; a brief description and level of funding of all major ongoing and planned GOU projects related to preserving the biodiversity in Ukraine.
- E. Brief description, structure, capacity, intended and perceived role of all important Ukrainian public institutions (both governmental and non-governmental) involved in preserving and/or enhancing the biodiversity in Ukraine, including institutions that are responsible for managing the protected areas; effectiveness and performance of those organizations in meeting their goals for environmental protection and conservation; a description of typical protective measures undertaken in areas that have different protection status, and their actual effectiveness; a brief description and level of funding of all their current and planned projects intended to support the conservation of the biodiversity in Ukraine; the institutional, economic and social issues and trends impacting Ukraine's ability to respond to environmental threats and natural resource degradation.
- F. A determination or statement, if possible, on the Ukrainians' perception of the importance of biodiversity and environment or of environmental issues and effectiveness of their response to these needs.
- G. Brief description of relevant current and planned activities of other donors and international non-governmental organizations (NGOs), levels of funding, performance, and opportunities for cooperation with large USAID projects and programs.
- H. Summary of perceived biodiversity conservation needs that remain unaddressed by either the GOU or local or international NGOs or other donors in Ukraine and estimated annual level of efforts required to address those needs.

The report shall be no longer than 50 pages including annexes. To meet the legal requirement, the results of this analysis shall be clearly presented as the "Actions needed to conserve biodiversity in Ukraine", whether by government, donor community, or others. These should be as specific as possible, identifying specific government agencies, policy actions, stakeholders or geographic areas, etc. The needs for conservation should be clearly delineated and prioritized.

Report 2 - USAID/Ukraine: Meeting Biodiversity Conservation Needs in 2011-2016 – will include a brief description of relevant current and planned areas of USAID assistance, an assessment of their potential for meeting the perceived biodiversity conservation needs, and recommendations for incorporating biodiversity conservation considerations in designing new USAID projects and modifying the current ones in Ukraine.

Since USAID/Ukraine is neither implementing nor proposing programs under a strictly environmental objective, the Contractor most likely will be seeking to identify cross-sectoral linkages. For example, there may be local governance or economic growth work with municipalities that may be contributing to conservation needs, or economic policy reform work that may have implications for biodiversity. The Contractor may also identify potential opportunities that could enhance USAID contributions in the biodiversity conservation within the context of CDCS for Ukraine. These opportunities could range from influencing policies and programs of the GOU or donors, to making an additional linkage to conservation that the Mission may not have been aware of. The report shall be no longer than 20 pages including annexes.

C.6 ACCEPTANCE AND PAYMENT

Payment will be made upon delivery and acceptance of the deliverables outlined above. The final reports will be considered accepted only after they have been approved by the EE/BEO. If necessary, the EE/BEO may request the Contractor to amend the final report (-s) and the Contractor shall be prepared to do this within five business days after receiving the EE/BEO's request, which shall be transmitted to the Contractor by the TO COTR.

ANNEX D: PERSONS CONTACTED, THEIR INSTITUTIONAL AFFILIATION, AND CONTACT INFORMATION

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