Biodiversity Assessment for Kazakhstan

Task Order under the Biodiversity & Sustainable Forestry IQC (BIOFOR)

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ACRONYMS

BIOFOR	Biodiversity and Sustainable Forestry Initiative
CAR	Central Asian Republics
CEP	Caspian Environmental Program
CITES	Convention on International Trade in Endangered Species
CLR	Committee on Land Resources
CWR	Committee on Water Resources
EIA	Environmental Impact Assessment
FFHC	Forestry, Fishing, and Hunting Committee
GEF	Global Environmental Facility
GIS	Geographic Information Systems
I.A.	illustrative activity
IUCN	International Union for the Conservation of Nature
MNREP	The Ministry of Ecology and Natural Resources
MoA	Ministry of Agriculture
NABU	Naturschutzbund Deutschland Bezirksverban Krefeid/ Viersen (Nature Protection Federation of Germany)
NBSAP	National Biodiversity Strategy and Action Plan
NEAP	National Environment Action Plan
NEC/SD	National Environmental Center for Sustainable Development
REAP	Regional Environment Action Plan
REC	Regional Environment Centre
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
WWF	World Wildlife Fund

SECTION I

Introduction

This assessment of the Republic of Kazakhstan's biodiversity status was funded by USAID's Regional Mission to the Central Asian Republics in Almaty under a contract to Chemonics International through the Biodiversity and Sustainable Forestry (BIOFOR) IQC (see Annex B, Scope of Work).

A two-person team consisting of Raymond Carl Daviesson and Dr. Galina Fet visited Kazakhstan from April 10 through May 2, 2000. During this period, they visited Almaty, Astana, Pavlodar, and Kokchetau. Mr. Daviesson and Dr. Fet were assisted by local biodiversity specialists Iskandar Mirkhashimov and Igor Glukhovtsev. During the team's second stay in Kazakhstan (June 25 through July 6, 2000), Dr. Fet attended the second meeting of the Biodiversity Thematic Group of the Caspian Environmental Program in Almaty. Mr. Daviesson, joined by Spike Millington, traveled to Aktau and Aterau to assess the ecological conditions of the north Caspian, with particular attention to the recent die-off in the Caspian seal population. (Their findings and recommendations regarding the seals have been documented and presented to the Mission under separate cover.)

The approach used in this assessment was to collect and analyze information on biodiversity and related areas through documentation searches and interviews with key individuals and organizations concerned with biodiversity, both throughout Kazakhstan and in Washington, D.C. (see Annex C, List of Persons Contacted). An extensive series of field trips was undertaken.

This biodiversity assessment has three interlinked objectives:

- To summarize the status of biodiversity and its conservation in Kazakhstan. Specifically, to analyze threats, identify opportunities, and make recommendations for the improved conservation of biodiversity. This information will help USAID and other organizations and individuals, as appropriate, make decisions related to biodiversity conservation.

- To meet the requirements stipulated under Section 119 (d) of the Foreign Assistance Act (see Annex A, FAA Sections 117 and 119), required when USAID missions are developing new strategic programs. The assessment also prepares the Mission to address issues arising under Sections 117 and 119 of the FAA, by providing information on biodiversity and natural resources in Kazakhstan.

- To analyze the impact of current and future USAID activities in Kazakhstan on biodiversity conservation, suggest actions that USAID could undertake to support biodiversity conservation in Kazakhstan that are consistent with current and future USAID programs, and identify special opportunities for the Mission in the area of biodiversity conservation.

SECTION II

Status of Biodiversity

A. Overview

The Republic of Kazakhstan is the largest country in Central Asia, with a territory of 2,072,000 km^2 and a population of 16 million people. In 1991, following the disintegration of the Soviet Union, Kazakhstan became an independent sovereign state. With Russia, Iran, Uzbekistan, Turkmenistan, Kyrgyzstan, and China as neighbors, Kasakhstan's borders stretch for 2,925 kilometers from west to east (from the Caspian Sea and the Lower Volga to the Altai and China) and 1,600 kilometers from north to south (from the West Siberian Plain and southern Urals to the Tien-Shan mountains and Kyzylkum Desert).

Kazakhstan lies mainly in a temperate climate zone, with subtropical deserts in the south. Lowland plains with steppes, semideserts, and deserts form 60 percent of the surface area, while arid foothills represent 30 percent and mountains 10 percent. The continental position of Kazakhstan in the center of Eurasia is reflected in the physical and geographical make-up of the territory, as well as its plant and animal life. Kazakhstan includes many lakes and rivers, of which the largest are Lake Balkhash and Irtysh River. Its position between the Siberian taiga and Central Asian deserts, and between the Caspian Sea and the high mountains of the Tien-Shan, means the country possesses a great variety of natural landscapes and ecosystems.

B. Major Ecoregions

With the greatest diversity of landscape types among the Central Asian Republics, Kazakhstan can be considered the most important country in Central Asia for biodiversity conservation. The country contains lowland deserts, steppes, mountain forests, and meadows.

Ecological zones range from semiarid, forested steppes in the northern zones and warm moderate deserts in the south to cold semideserts. The eastern and southern parts of Kazakhstan (southwestern part of the Altai, the northern Tien-Shan, and the western Tien-Shan) feature several mountain systems, including the Karatau mountains. The Altai is characterized by a typically Siberian flora and fauna, found nowhere else in Central Asia. Generally, the biodiversity of the Kazakhstan mountains increases in richness from the northeast (Altai) to the southwest (West Tien-Shan and Karatau).

Forests occupy only 3.8 percent of the country's surface, mainly in the northern part of the country and in the high mountain slope valleys and riparian areas. The mountain ecosystems, which cover more than 7 percent of the country, contain more than 30 plant communities dominated by woodlands but sprinkled with shrublands and mountain meadows.

Forest Steppes

Forest steppes are represented in the very northern part of Kazakhstan, continuous with the West Siberian Lowland. They include aspen-birch and aspen forests and meadow steppes. Biodiversity in the latter is the richest among all steppe types, with grasses dominating, in addition to well-developed herbaceous communities. Most original steppe territory has been modified by agricultural use. The fauna of the forest-steppe region is characterized by a combination of typically forest and steppe species.

Lowland Steppes

Lowland steppes form a broad band across northern Kazakhstan. Steppe ecosystems host more than 20 major plant formations. However, most steppes are either heavily ploughed or grazed. The dominant vegetation consists of grasses, notably the various species of feathergrasses (*Stipa spp*.), but also including fescues (*Festuca spp.)* and wild oats (*Avena*). Numerous herbaceous species are also present. Characteristic shrubs include *Spiraea, Caragana,* and wild cherry (*Cerasus*). Occasional stands of birch, pine, and alder can be found.

Steppe habitats are favored by rodents such as ground squirrels (*Citellus*), hamsters (*Cricetus, Cricetulus, Podopus*), voles (*Microtus*), lemmings (*Lagurus*), and marmots (*Marmota bobac*). The only ungulate common in the southern steppes is the saiga antelope (*Saiga tatarica*), which was at the verge of extinction in the early 20th century but has since recovered, although there is evidence of a recent decline. Wolves (*Canis lupus*), foxes (*Vulpes vulpes*, *V. corsac*), and steppe ferret (*Mustela eversmanni*) are typical carnivores in this ecosystem.

Saiga antelope. One of the few large steppe animals that is still relatively abundant. However it is threatened by poaching and habitat loss. Reprinted courtesy of the National Strategy and Action Plan on Conservation and Sustainable Use of Biological Diversity of the Republic of Kazakhstan.

Lowland steppes also support a characteristic and threatened bird fauna, including bustards (*Otis tarda*, *O. tetrax*), demoiselle crane (*Anthropoides virgo*), sociable plover (*Chettusia gregaria*), and black (*Melanocorypha yeltoniensis*) and white-winged larks (*M. leucoptera*).

Semideserts and Deserts

In southern Kazakhstan, semidesert ecosystems are characterized by shrub (notably wormwood *Artemisia spp*.) and shrub/grass communities. Further south, true deserts are characterized by the typical communities of *Artemisia*, adapted to different soil types. Rocky and clay deserts give way to more sandy deserts in the extreme south. Saxaul (*Haloxylon*) woodlands are characteristic of sandy deserts, with endemic sand acacias (*Ammondendron*) also playing an important ecological role. *Calligonum* and *Astragalus* are widespread plants. A distinctive type of desert

ecosystem is found in the cliffs (*chinks*) of Mangyshlak, Ustyurt, and the Ili Depression. The ecosystems where *Salsola spp*. dominate are found in Betpak-Dala and the Lake Balkhash area.

Many endemic species comprise the fauna of the desert regions. A diverse rodent community includes more than ten species of jerboas, with several endemic genera, and the unique selevinia (*Selevinia betpakdalensis*) in its own family. Larger mammals include the wild ass (*Equus hemionus*) and the goitered gazelle (*Gazella subgutturosa*). The houbara bustard (*Chlamydotis undulata*) is a threatened bird species characteristic of the semi-desert region. The reptile fauna is also very diverse.

Foothill Steppes and Deserts

In the West Tien-Shan, lower altitudinal belts are occupied by ephemeral semideserts, while higher (1200 to 2000 m) vegetational zones contain open mountain meadows and steppes (dominated by *Elytrigia trichophora, E. repens, Poa bulbosa*) mixed with juniper woodland (*Juniperus turkestanica, J. semiglobosa, J. seravschanica*). Valleys and riparian tracts in the semi-arid steppe zones contain willow, spruce, poplars, *Elaeagnus*, and tamarisk.

High mountain peaks are home to wild sheep, goats, and snow leopards.

Mountain Forests

Steppe and savanna vegetation is also represented in middle and higher mountain belts. Dry, xerophile (*shiblyak*) woodlands are also found here. Typical trees and shrubs include hawthorns, ephedra, almond, and wild cherries. Mountain riparian forests are represented by willows (*Salix*), birches (*Betula*), and poplars (*Populus*). At elevations between 1200 and 1500m, woodlands include aspen (*Populus communis*) and pistachio (*Pistacea vera*).

Between 1700 and 3200 m., spruce forests are found extensively. Tree species are represented by spruce (*Picea obovata, Picea schrenkiana*), fir *(Abies sibirica*), pines (*Pinus sibirica*), and mountain larch (*Larix sibirica*). Spruce forests contain the southernmost populations of boreal species, such as hawk owl (*Surnia ulula*) and merlin (*Falco columbarius*), in combination with a set of montane endemics.

Juniper (archa) forests are found in the subalpine and lower slope regions. Juniper species include *Juniperus pseudosabina, J. siberica, J. seravschanica,* and *J. turkestanica*. These forests are home to a diverse fauna and flora that includes elements of a typically European type mixed with Central Asian montane species. They also include a number of endemic plant species.

A particularly diverse and threatened forest that occurs above 1000 m. is the temperate walnut (*Juglans regia*) forest. These are relict forests from the Tertiary subtropical era and include many wild fruit species. Also mixed in are endemic apple species (*Malus sirversii, Malus kirhhisorum*), apricot, (*Armeniaca vulgaris*), plum (*Prunus*), and birch (*Betula pendula, Betula*

pubescences, Betula jarmolenkoana), interwoven with roses (*Rosa spinosissima* and *Rosa plaphyacanta,* species unique to this part of Central Asia).

Subalpine and Alpine Meadows

Meadows at high elevations, extending from the upper tree zone through the subalpine and alpine zone are typically a mixture of grass and herbaceous species, with diversity generally decreasing at higher altitudes, but nevertheless representing between 50 to 100 species. Voles (*Microtus*), pikas (*Ochotona*), and marmots (*Marmota*, including the endemic *M. menzbieri*) are typical mammals. Rarer species include the endangered snow leopard (*Uncia uncia*), wild sheep (*Ovis ammon*), and Siberian mountain goat (*Capra sibirica*). Birds are well represented, including several species of vultures and snowcocks (*Tetraogallus*), as are high altitude montane specialties, such as snowfinches.

Wetland Ecosystems

Water and coastal ecosystems, comprised of fresh water and saline lakes, wetlands and marine ecosystems, and littoral semi-arid zones remain important breeding and migratory flyways in Kazakhstan for more than 45 species of migratory waterfowl.

Wetland ecosystems in Kazakhstan are represented by the many lakes, marshes, rivers, and streams, primarily in lowland areas. Lakes Balkash, Zaisan, and Alakol reign as the largest among an estimated 50,000 lakes in the country. In addition to the six million hectares of floodplains, an estimated 2.2 million hectares of water meadows and riparian forests exist in Kazakhstan. The littoral zones of the Caspian and Aral Seas also represent important wetlands.

Marsh areas, such as the Ural Delta, often contain major areas of reed *Phragmites* and cattail *Typha,* which are important breeding areas for wetland bird species. Because predators find access difficult, islands remain important for breeding birds. Other plant species include locally rare water lilies (*Nymphaea spp.*), water chestnut (*Trepa natans*), and a variety of submerged and emergent species.

Wetlands support breeding populations of several globally rare, threatened, and endangered bird species. These include white-headed duck (*Oxyura leucocephala*), ferruginous duck (*Aythya ferruginea*), marbled teal (*Marmaronetta anguirostris*), Dalmatian pelican (*Pelecanus crispus*), great black-headed gull (*Larus icthyaetus*), and white-tailed eagle (*Haliaetus albicilla*). Greater flamingos (*Phoenicopterus ruber*) nest at a few sites in Kazakhstan, while Lake Alakol is one of only two nesting places for relict gull (*Larus relictus*) in the world. The global population of this species is only 1,800 pairs.

Wetlands are especially important for migratory and wintering birds, and Kazakhstan is on two major flyways. The globally endangered Siberian white crane (*Grus leucogeranus*) is of major concern, but other rare and threatened wintering and passage wildfowl include lesser white-fronted goose (*Anser erythrops*), Bewick's (*Cygnus bewickii*) and whooper (*Cygnus cygnus*) swans.

Tugai ecosystems (riparian forests in arid lands) in intact condition are rare and very threatened in Kazakhstan. Willows (*Salix*), and poplars (especially *Populus diversifolia*), and Russian olive (*Elaeagnus angustifolia*) are dominant species. *Tugai* forests provide oases for many animal species in steppe or desert environments. One species of restricted distribution recently threatened by the loss of *tugai* forest is the yellow-eyed stock dove (*Columba eversmanni*).

Caspian Sea

The Caspian Sea is the largest inland body of water in the world, with a total surface area of 400,000 km^2. A unique fauna and flora, including 90 percent of the world's sturgeon population, has been preserved in the Caspian. Caspian coastal wetlands and islands are important nesting, wintering, and migratory sites for numerous waterfowl species. Wetlands along the shore have been affected not only by drainage and pollution but also the changing water levels of the Caspian Sea, which inundate and then desiccate the wetlands, often resulting in salinization and soil contamination. Vegetation along the Caspian shore is represented by semidesert flora, with *Sueda* and *Artemisia* the dominant vegetation types.

C. Species Diversity

The varied terrain and climatic conditions contribute to a diversity of ecosystems and species. The fauna of Kazakhstan includes 178 species of mammals, 489 species of birds and 117 species of fish. An estimated 6,000 species of vascular plants are found in Kazakhstan. This high biodiversity results from the combination of faunas and floras of different biogeographical origins. The diverse and threatened large mammal fauna includes saiga antelope, wild sheep and goats, and their predators, including wolf and snow leopard.

Populations of vulnerable species — such as saiga, Caspian seal, Caspian sturgeon, and migratory birds — undertake large-scale annual movements that increase their exposure to risks from anthropogenic and climatic factors. Kazakhstan has a global significance for biodiversity due to the presence of internationally important populations of rare and threatened species of flora and fauna, often with restricted distribution, as well as its importance as a migratory crossroads and wintering area for wildfowl, particularly along the Caspian shore.

C1. Flora

More than 6,000 species of vascular plants are found in Kazakhstan, along with 5,000 species of fungi, 485 species of lichens, 2,000 species of algae, and 500 species of bryophytes. Among the vascular plants, 14 percent are endemic to Kazakhstan. Especially interesting are 10 monotypic endemic genera of plants found only in Kazakhstan: *Physandra, Rhaphidolophyton, Pseudoeremostachys, Pseudomarrubium, Botschanzevia, Cancriniella, Spiraeanthus, Pterygostemon, Pastinacopsis*, and *Niedzwedzkia*. The high level of endemism in the Kazakhstan flora indicates the original character of the flora and its local development on the crossroads of northern and southern lowland and mountain landscapes during a complicated geological history. In general, Kazakhstan flora was formed from the elements supplied by Eocene subtropical vegetation, Oligocene mesophilic forests, and Ancient Mediterranean flora of the Neogene (including proto-steppes of the Miocene-Pliocene epochs). Many relict species of those ancient floras still survive in Kazakhstan. For example, *Spiraeanthus schrenkianus, Rhaphidolophyton*

regelii, Echinops saissanicus, and *Zygophyllum potaninii* have an Eocene origin, while other species are known as Oligocene relicts: the Turkestan birch (*Betula turkestanica*), walnut (*Juglans regia*), Sievers' apple (*Malus sieversii*), Persian mountain ash *(Sorbus persica*), and Talas poplar (*Populus talassica*). Yet others are Miocene-Pliocene relicts, such as dwarf rhubarb (*Rheum nanum), Iris scariosa,* and *Allium polyrrhizum*.

C2. Fauna

The animal life of deserts, semideserts, and mountains of Kazakhstan is characterized by a high degree of endemism, especially among invertebrates, mammals, and reptiles. The rich vertebrate fauna of this country numbers 835 species. Rare, threatened, and endangered species include animals from various habitats.

Table 1. Number of species from Kazakhstan, and species included in the Kazakhstan Red Data Book (KRDB) and the IUCN Red Data Books (1996).

Group	Total number of species	KRDB	IUCN
Plants (vascular)	6,000	307	71
Mammals	178	40	33
Birds	489	57	23
Reptiles	49	10	3
Amphibians	12	3	2
Fishes	107	16	17
Insects	50,000	85	13

Kazakhstan harbors 178 mammal species. A number of rare species are included in both Kazakhstan and IUCN Red Data Books, although their populations in Kazakhstan are not currently directly threatened. These include Tien-Shan bear (*Ursus arctos*), Turkestan lynx (*Lynx lynx*), manul cat (*Felis manul*), sand cat (*Felis margarita*), marbled polecat (*Vormela peregusna*), Persian gazelle (*Gazella subgutturosa*), and the Ustyurt and Kazakh subspecies of wild sheep (*Ovis ammon*). The snow leopard (*Uncia uncia*) still inhabits high mountain belts of the Tien-Shan. Among endemic desert species is a unique rodent, *Selevinia betpakdalensis*. Another rare rodent, five-toed dwarf jerboa (*Cardiocranius paradoxus*) inhabits the Lake Balkhash area.

Almost 50 species of reptiles (tortoises, lizards, and snakes) are found in Kazakhstan. Of these, the Red Data Book lists such desert and semidesert reptiles such as toad agamas (*Phrynocephalus melanurus, P. versicolor*), gray monitor (*Varanus griseus*), lacertid lizards (*Eremias multiocellate, E. vermiculata*), and colubrid snakes (*C. jugularis, C. rhodorhachis, C. spinalis, Elaphe quatuorlineata*). Among 12 amphibian species is the unique Semirechye salamander *Ranodon sibiricus*. About 100 fish species are known from Kazakhstan, including many commercially important species.

Populations of large mammals have declined almost everywhere in Kazakhstan, primarily as a result of habitat degradation. Some species were extirpated as a direct result of hunting. These include cheetah (*Acinonyx jubatus*), red wolf (*Cuon alpinus*), and the Kyzylkum subspecies of wild sheep (*Ovis ammon)*. Other threatened and endangered mammals include Bukhara deer (*Cervus elaphus bactrianus*), two subspecies (Altai and Karatau) of wild sheep (*Ovis ammon*), wild ass (*Equus hemionus*), desert lynx (*Felis caracal*), desman (*Desmana moschata*), Central

Caspian Seal: A Vulnerable Endemic

The Caspian seal (*Phoca caspica*) is endemic to the Caspian Sea, with a population most recently estimated at 420,000. A large die-off of seals occurred in April/May 2000 with more than 11,000 corpses found. The mortality was apparently linked to the very mild winter of 1999/2000, which resulted in almost no ice shelf in the north Caspian. Seals normally breed on the ice pack in a dispersed pattern. This winter, due to the absence of ice, seals were forced to breed on a limited number of small islands, where crowding was very high. The high density resulted in unfavorable conditions for breeding and a high risk of infection at a time when seals are normally physiologically stressed. An international team of scientists, working as part of the Caspian Environment Program's Ecotoxicology Project (ECOTOX), has now concluded that canine distemper virus infection was the primary cause of the mortality, although other environmental factors may have contributed to the deaths. Canine distemper virus is a member of the morbillivirus group of viruses. In 1987-1988, it caused high mortality in Baikal seals (*Phoca siberica*) in Lake Baikal in Siberia. Other morbilliviruses have caused several major epizootics among aquatic mammal populations in various regions of the world in recent years.

One noticeable feature of all the dead and dying seals during this epidemic has been their emaciated condition. This may be simply a consequence of the virus. However, there is also a possibility that some of the seals have difficulty in finding sufficient food. If possible, the status of fish stocks, especially of kilkas, throughout the Caspian should be monitored to see if there might be a shortage of food available for the seals. If this were the case, it could exacerbate the problem by weakening their condition. If kilka stocks should be found to be low, action should be taken to reduce fisheries pressure to allow the stocks to recover. The recent discovery of exotic Mnemiopsis comb jelly fish in the Caspian poses an additional threat to fish stocks, and ultimately, seal populations.

Analyses also confirmed high levels of organochlorine pesticides, such as DDT, which may have lowered immunity to disease outbreaks. Another effect of organochlorine contamination as well as causing immunosuppression is that it reduces fertility. Fecundity of Caspian seal adult females investigated in the past few years has been less than 30 percent. At present we need to know more about the population size of the Caspian seal overall and in different areas of the Caspian as well as contaminant levels in the seals, to begin to understand the epidemiology of the virus. We do not have updated figures on the present population size of the Caspian seal. However, the present rate of mortality, together with other pressures on the seal, obviously cannot continue indefinitely without a danger of extinction.

Possible measures to alleviate the problem would be to reduce other stresses on the seals as much as possible, by:

- Limiting pollution by pesticides (especially DDT) and other organochlorine contaminants (such as PCBs)
- Stopping all hunting of Caspian seals
- Reducing the bycatch of seals in fisheries

Adapted from CEP press releases, 2000

Asian otter (*Lutra lutra seistanica*), Menzbier's marmot (*Marmota menzbieri*), and giant mole rat (*Spalax giganteus*).

Many birds have suffered from direct persecution, notably birds of prey, such as eagles, falcons, and vultures. In recent years, these have been under additional pressure because of the large sums of money that certain species command for falconry purposes in the Middle East. Likewise, snakes (*Vipera bera, V. ursini*) are under pressure due to their use for venom.

Several species of fish disappeared due to the Aral Sea tragedy, including probably the rare endemic shovelnose sturgeon (*Pseudoscaphyrhynchus fedtschenkoi*). Extensive commercial fisheries in the Caspian Sea depleted the stock of valuable sturgeon family species (*Huso huso, Acipenser guldenstadti, A. stellatus, A. nudiventris*), as well as pike (*Esox lucius*). Commercial collection of butterflies and beetles for export undermines populations of rare species.

C3. Agrobiodiversity

Morels. Edible fungi such as these provide an important resource for local populations, with potential for small-scale commercial production.

Many species of wild plants in Kazakhstan are harvested intensively for food, medicine, and construction. The most important wild food plants are apples (*Malus sieversii*), apricots (*Armeniaca vulgaris*), hawthorns (*Crataegus spp*.), and barberry (*Berberis spp.)*. Annual yield of apples, hawthorn, and apricot by forest industry in Kazakhstan is approximately 300 tons. Valuable tanning plants include *Polygonum, Rumex*, and *Rheum spp*. Reeds (*Phragmites, Achnatherum*) are used in household construction. Not less than 70 species of plants are used for the production of essential oils (including species of *Artemisia, Hyssopus, Mentha*, and *Achillea*). Medicinal plants are widely distributed in Kazakhstan, mainly in the mountain ranges. Studies of major medicinal plants have demonstrated that most species have enough wild resources to satisfy local demand. Some species, such as licorice (*Glycyrrhiza glabra, G. uralensis*), are present in commercial quantities (estimated 75,000 tons) which opens the possibility of their export.

C4. Threats to Biodiversity

The legacy of industrial and agricultural expansion that occurred in most republics of the former Soviet Union negatively affected Kazakhstan's natural ecosystems and related ecological processes. Habitat loss and desertification remain key issues for the country's biodiversity, resulting mainly from 20th century anthropogenic causes, including farming, irrigation, industrial pollution, and land development. Notably, the policy of putting "virgin land" steppes under plow in the 1950s and 1960s led to widespread degradation, which catastrophically affected the soil and habitat quality throughout the steppe and foothill zones.

The principal threats to Kazakhstan's biodiversity are:

1. Loss or degradation of habitat through direct conversion or exploitation of natural ecosystems.

    - *Conversion of steppes to arable agriculture and cotton production*. The plowing of the fertile soils of the northern steppes for rain-fed grain crops has resulted in a direct loss of feather grass habitats. Furthermore, soil integrity and fertility has decreased, and, where agriculture has been abandoned, weedy species more tolerant of disturbed conditions have replaced the original feather grass communities. In the drier, more southern steppes, unsustainable agricultural practices have accelerated the process of desertification.

Sturgeon Fisheries: A Critically Endangered Resource

Sturgeons are representatives of an ancient family of fish, dating back some 250 million years. They feed on small bottom-dwelling animals, and migrate up-river to spawn. Some sturgeon species can live for up to 150 years and reach up to six metres long, weighing in at more than 1.5 tonnes. This makes the sturgeon one of the largest fresh water fish in the world. Thirteen species of sturgeon are threatened, and two are believed to be close to extinction: the Syr-Dar and small Amu-dar shovelnose sturgeons that occur in tributaries of the Aral Sea. Today, the largest populations of sturgeon are found in the Caspian Sea.

Sturgeon roe processed as caviar is a major source of foreign exchange for Caspian states, where more than 60 percent of world caviar production originates. Caviar retails at up to $3,000/kg. In recent years, sturgeon stocks have collapsed. Causes include overfishing and destruction of the fish's food supply (small, bottom-dwelling animals) through pollution, as well as the loss of traditional freshwater spawning grounds, both through pollution and inaccessibility due to dam construction and reduced river flows caused by irrigation practices. In the northern Caspian, the Ural River remains the only undammed river available for spawning, but increased siltation has reduced the access to, and suitability of, former spawning grounds. It is estimated that the number of sturgeon has declined by 50 to 70 percent in the last century. This collapse led to the listing of sturgeon species on Appendix II of the Convention on International Trade in Endangered Species (CITES), indicating that unless trade is strictly regulated, these species may become threatened or endangered. This action limits legal trade of sturgeon and caviar to levels considered to be sustainable. Several projects have been initiated with the aim of increasing sturgeon populations in the Caspian through the development of hatcheries, improved access to spawning grounds, better control of illegal harvesting, and reduction in pollution levels

Ninety percent of the world's caviar comes from just three species of sturgeon: the beluga or giant sturgeon (*Huso huso*), Russian sturgeon (*Acipenser gueldenstaedti*) and stellate sturgeon (*Acipenser stellatus*). Catches have dropped from 20,000 tonnes annually in the late 1970s to 1,000 tonnes in the late 1990s. Alarmingly, although fishing efforts have increased, the official catch has plummeted by nearly 95 percent in the last 20 years.

The rising demand for caviar cannot be met under current fisheries regulations. Already local experts and fisheries agents concur that stocks of sturgeon in the Caspian Sea are continuing to decline. This is in part due to their vulnerability to overfishing because of their slow sexual maturity (as much as 25 years in female beluga sturgeon). Furthermore, Russian scientists have found deformities in eggs and adult sturgeons. Research has found DDT and PCBs in samples of caviar. These factors have implications for the species' survival and the quality of caviar and highlight the need for pollution control.

Russian anti-poaching officials and border guards have so far this year found more than 70 tonnes of sturgeon entangled in illegal nets. This is estimated to be only a small fraction of the illegal catch. Overfishing, for both legal and illegal markets, has continued to undermine the conservation prospects of the species and could herald the collapse of the stock and the international caviar market.

- *Unregulated deforestation*. Cutting of woodlands and forests for commercial and fuelwood needs, as well as the clearing of land for agriculture, is a major threat to biodiversity in Kazakhstan. The desert-adapted saxaul (*Haloxylon spp*.) woodlands, the riparian *tugai* forests, and mountain forests have been particularly affected.

- *Drainage of wetlands*. Rich water meadows have increasingly been drained, either directly or indirectly, resulting in loss of species diversity and wholesale reduction of important reedbed habitats. The quality of the pasture for grazing and hay production has consequently declined.

- *Overgrazing by domestic livestock*. The conversion of steppes and wetlands has considerably reduced the area available for livestock grazing, concentrating domestic herds on fragile remaining habitat such as stony and hilly steppe zones and around water points. This in turn results in further degradation. Traditional practices, such as

pasturing in mountain meadows, are being replaced by year-round grazing near homesteads.

2. Loss or degradation of habitat through indirect effects of changing land-use patterns.

    - *Changing water balance through poor irrigation practices*. Widespread irrigation, using poor, water-wasting technologies, has had a disastrous effect on the country's ecology, leading to dessiccation, salinization, erosion, and alteration of water balances. This is most conspicuous in the Aral Sea region but is widespread throughout Kazakhstan.

    - *Diversion of water through hydroschemes*. Dams, such as the Kapchagai on the Ili River and the Bukhtarma on the Irtysh River, together with extensive irrigation and drainage systems have resulted in significant changes in local hydrological regimes. *Tugai* forests that depended on natural cycles of flooding have been adversely affected, and shallow wetlands have dried up. Transboundary issues of water supply and distribution are also at issue, as upland watersheds are degraded, leading to lower and irregular supply.

    - *Overuse of agricultural inputs*. Soviet agriculture was characterized by high levels of inputs, such as fertilizers, pesticides, and herbicides. Concentrations of these inputs through the irrigation systems resulted in salinization of soils.

    - *Effects of industrial pollution*. Effluents from industrial pollution can be especially toxic, and pollution control mechanisms are not generally in place. In addition to direct discharge into water bodies, pollutants are concentrated in shallow water bodies that, when dried up, are subject to wind erosion, so that pollutants are often carried many miles, affecting human and ecological health. Heavy metals and other mineral salts are finding their way into the aquifers and marine and freshwater habitats with predictable environmental consequences. With the decline in industrial and agricultural output following the breakup of the former Soviet Union, pollution and agricultural input loads have decreased. For example in Aktau, on the Caspian shore, the number of large industrial enterprises has declined from twenty to three. As a result, offshore Caspian waters are probably cleaner now than they have been for many years.

3. Over-exploitation of individual species, through hunting, overfishing, and persecution. Since the decline of the strict enforcement capacity of the former Soviet protected area and wildlife systems, citizens of the newly-independent republics have taken advantage to promote hunting, including trophy shooting. Private interests in the caviar trade have promoted overfishing of sturgeon stocks in the Caspian. Collection of birds of prey for the falconry trade, particularly to the Arab states, has increased, as has collection of threatened reptiles, such as Horsefield's tortoise, for the pet trade.

4. Effects of introduced, or non-native species. As steppes and other natural ecosystems have been degraded, invasive plant species, including non-native species have flourished, inhibiting return to the original condition, should other pressures be reduced. In the Caspian Sea, non-native species, such as the comb jelly *Mnemiopsis leidyi*, recently discovered in the Caspian, has the potential to cause major ecological disruption. In the Black Sea, this species was responsible for the collapse of the fishery and a major decline in biodiversity, due to predation on fish eggs and other plankton, combined with an enormous capacity for reproduction.

The Aral Sea Crisis

The Aral Sea basin, which is the hydrological sink for almost the entire Central Asia region, has suffered the worst impacts from the development of irrigated agriculture. The expanded and inefficient use of irrigation water resulted in a rapid decline of inflow to the sea causing its level to drop drastically. It is now only one-half its original size. The direct impacts of this change has been the increase in the salinity of the sea from 10 to 30 percent, the creation of a highly saline desert about 20,000 km2 in size on the former seabed, and the gradual desiccation of the two deltas. Although historically the Aral has varied considerably in size, never has this change occurred at such a rate (less than 20 years) or in combination with the other negative anthropogenic activities — hence ecosystems and species have not been able to adapt adequately. Of the 24 original fish species said to occur in the Aral, only four remain. The ecologically rich deltas, "wetlands within deserts," are rapidly deteriorating. Natural vegetation, particularly important riparian (tugai) forest, has either been cleared for agricultural purposes or is dying due to changed water regimes. Economically, the desiccation of the Aral has deprived the area of an annual fish production of 40,000 tons, as well as a steep decline in employment and agricultural production. The local climate has become more severe, with higher summer temperatures and lower winter temperatures, and dust storms carry salt and pollutants over great distances, affecting ecosystem and human health.

Adapted from Uzbekistan NBSAP

SECTION III

Status of Biodiversity Conservation

A. Protected Areas

The protected area system and categories of protected areas have been largely inherited from the former Soviet system, with the "highest" level of reserves being the strictly protected national reserves (*zapovedniks*). There has been some evolution in recent years to include more multiple use areas, such as national parks.

The existing network of protected areas in Kazakhstan includes 12 *zapovedniks*, eight national parks, and dozens of conservation areas (*zakazniks*). In addition, there are a number of "natural monuments," or natural areas such as waterfalls, valleys, and small areas of natural interest and beauty. The total of all protected areas represents less than 2 percent of Kazakhstan's land area.

The existing protected area system provides some coverage of representative ecosystems and ecoregions, although many protected areas are too small to effectively protect species with large home ranges. However, the status of these protected areas is tenuous and — like the ecosystems and species that they are intended to protect — poorly known. For the past five to eight years, individual protected areas have been operating on vastly reduced budgets and staffing, with little working equipment, transportation, or communications. Staff have suffered from low and irregular salary payments and are generally demoralized. Unable to properly patrol their areas, there has been a corresponding rise in illegal cutting of timber, hunting, and incidents of man-made fires. Staff spend much of their time in other activities to provide food for their families, and this includes the selling of seedlings, timber, and food production within the protected areas. Only considerable commitment and investment will reverse the downward spiral of degradation engendered through the past ten or more years of neglect.

In addition to the nature reserves and national parks, the NBSAP calls for the creation of a network of Protected Wetlands of International Significance as part of an international and regional network of habitats and flyways for migratory species. Additionally, other important waterways, lakes, and riparian habitats were included in the network as part of the Ramsar Convention agreement. Consequently, the Tengis lakes and water system is now being prepared for a UNESCO Biosphere designation with the help of funding by NABU of Germany.

B. Forests

The forests of Kazakhstan cover only approximately 3.8 percent of the land area of the country and include several categories of protection, from forest reserves to national parks. However, forestlands in Kazakhstan are under severe threat. Notwithstanding the 1999 assessment of the NBSAP on conservation and sustainable use of biological diversity in Kazakhstan with regard to forestry issues, the country is rapidly losing most of its relict forests to uncontrolled fires,

windborne pathogens, illegal cutting, and poor or non-existent management. Two examples are cited below.

In l997, a fire in the Bayanaul National Park destroyed more than 30 percent of the country's relict forests because of the lack of communications between the regional forestry center responsible for management and the central administrative department responsible for funding. By the time that contact was made, and the decision reached to spend the funds to pay for aerial suppression was made, 30 percent of the relict pine forests was destroyed.

At the time of this assessment, a much larger area of the same forest is under attack from windborne pathogens (fungal infestation), which is killing vast tracts of the remaining relict pine forests. The park foresters would normally use aerial spraying to combat such infestation. However, there is no money to pay for either the chemicals or aircraft for such intervention, and consequently, in an attempt to stem the infestation, park foresters are forced to cut and burn the infected trees. This method, however, is risky, since fires create air thermals, which can spread the pathogen's spores even further.

In addition to direct threats such as fires, pests, and disease, effective forest management has been severely affected by lack of budgetary support to management agencies. The departments of forestry have been moved from the Ministry of Environment to the Ministry of Agriculture and now is a department under the Ministry of Ecology. It has gone from a centrally driven management system to a regional one, without the corresponding funding and staffing. Consequently, it is understaffed, and functions in a drastically reduced capacity, if at all, in most areas of forest management. The overall effect is one of management by crisis rather than management based on well-researched, strategic planning.

This situation pertains not only to the Department of Forestry but also to protected areas. The reduced staffs have little or no equipment, transport, or communications and go through long periods without salary. Most of them are engaging in similar 'private' activities as those in forestry, trying to survive from one pay gap to the next. The greatest negative impact on the remaining forests of Kazakhstan is the lack of capacity of the traditional stewards of the forests to properly manage the resource or respond to natural disasters (forest fires, pathogen infestations). Lack of sufficient funding, staffing, and institutional infrastructure has drastically reduced their capacity to manage the resource and hence their effectiveness in dealing with the escalating effects of ten years of governmental and economical transition.

As part of the NBSAP forest program, a wide range of improvements in forest technology were called for, including optimizing forests resources, creating forest fire aviation units, and developing, testing, and constructing a dirigible balloon for forest fire fighting. Additionally, it called for a program of forest pathology monitoring organizations and an integrated disease control program. Finally, the plans called for a program of reforestation in and around all national parks and protected areas, to be carried out on a progressive basis.

The NBSAP forest program had set the year 2000 as its target finish date. However, none of these goals for the conservation and sustainable use of the biological diversity of Kazakhstan in the forestry sector have been realized to date. While some very limited reforestation work has

been done, the effect these activities have had on the status of forestry is too small to be a factor. There is little hope for reversing the situation unless the Kazakhstan government undertakes a major reform to rebuild the capacities of the supporting institutions, addresses the factors contributing to the decline of capacity in these institutions, and ensures implementation of the NSAP forestry component.

If the present rate of loss of forest cover in both the forest reserves and protected areas continues, no relict forests will be left in the country within the next ten to fifteen years, except small fragmentary stands.

C. Agricultural Lands

Agriculture and livestock form the basis of Kazakhstan's rural economy. Like many other aspects of the economy, the collapse of the former Soviet Union markedly affected the country, especially in the agricultural sector. The inputs and infrastructure (such as subsidized fertilizers and irrigation) that supported agricultural production during that era are no longer available to support marginal land cultivation. The emphasis on production by the communal farming systems was geared toward the growing of economically important crops, such as cotton. Heavily subsidized, they created problems in water pollution, salinization, and waterlogging. Today there is a slow trend towards more diverse crop production, including market vegetables.

The once efficient irrigation systems have been poorly maintained. As in other parts of the CAR, irrigation issues present a growing problem and are a divisive factor in many transboundary contexts since the watersheds that produce the water may be located in one country, while the water is mainly used in another.

Notwithstanding this, the trend away from the former agricultural practices offers some significant opportunities if land tenure issues could be resolved in the country. Land privatization is being carried out in some areas, but the more widespread application seems to be a long way off. The increased demand for arable agricultural land, as well as that being taken for industrial usage and mining, is having a decided negative impact on biodiversity. The loss of habitat, the pollution of rivers, lakes, and other important wetlands and marine environments under the "fast track" development environment presently fostered by the government of Kazakhstan has vastly increased the occurrence of major environmental hazards throughout the country.

Open cast and "shallow pit" mining operations have already caused several major rivers and lakes to be polluted and fish spawning grounds to be destroyed.

SECTION IV

Strategy and Policy Framework

A. Policy Famework

Concern for Kazakhstan's biodiversity sector has existed for nearly a decade. To counter the degradation of natural ecosystems and the effects of radioactive fallout (which resulted from poor resource use practices and open-air nuclear device testing, respectively, during the Soviet era), as well as the rapid deterioration of the environment due to the drying up of the Aral Sea, Kazakhstan signed the l992 Convention on Biological Diversity, which was ratified in l994. In l996, work began on the development of a National Strategy for the Conservation and Sustainable Use of Biological Diversity, which culminated in the 1998 publishing of the *National Report of the Republic of Kazakhstan on Conservation and Sustainable Use of Biological Diversity*. The report resulted in the present NBSAP on the conservation and sustainable use of Biological Diversity, supported by UNDP and the Global Environment Facility (GEF). The same year, Kazakhstan completed the development of a National Environmental Action Plan (NEAP), in which biodiversity was a leading component.

At the time of this assessment, the National Biodiversity Strategy and Action Plan for Kazakhstan, (conceived in l999), which called for a series of progressive actions to be completed within a stated time (most were to be completed by the year 2000, with longer-term actions by the year 2005) has achieved very modest results to date. In some cases, delays have been caused by the lack of legislation, but the overall impediment has been the lack of government funding.

In addition to national initiatives, the government of Kazakhstan is signatory to a large number (in excess of 100) of accords, protocols, conventions, pacts, and international agreements, many containing environmental, biodiversity, and conservation components. Most of these agreements contain membership fees and monitoring obligations from each member state as part of a global or regional monitoring matrix. Kazakhstan has not paid its full membership in many of these agreements, nor has it complied with the obligations or the integrated monitoring component of its agreements. A real question exists as to whether the various NEAPs, NBSAPs, or GEF action plans, or Kazakhstan's membership in related regional or international agreements, are truly the expression of the country's concern to protect its biodiversity and adopt and enforce resource legislation and development practices.

While many of the national "plans" refer to a "policy framework," little evidence supports that such a framework exists in a coherent and implementable form. Membership of many protocols, conventions, international "agreements," and pacts are often wrapped in a proclaimed "framework." The Kazakhstan government has included this word in most of its environmental proclamations.

B. Legislative Framework

Environmental legislation in Kazakhstan is based on the Constitution of the Republic of Kazakhstan of l995 (Article 31), by the Resolution of the President of Kazakhstan of l996, and by the l997 Law on Environmental Protection, the last of which provides the overall framework for environment protection in Kazakhstan. The purpose of the law is to prevent pollution and encourage the rational use of the environment. It requires the involvement of local communities and stakeholders in natural resources management and for the first time, incorporates some free market principles such as the "polluter pays" into Kazakh environmental policy.

In l997, a further law was passed on Special Protected Natural Territories, which specifies the various categories of protected areas in Kazakhstan based on international standards. These designations range from nature conservation areas and national parks to natural monuments and national forests. The protected area system is organized under thirteen management designations that emphasize different management regimes depending on purpose, level of protection, and special features.

Forestry Codes and Regulations, Land Regulations, and Mineral Resources Codes were adopted by the government of Kazakhstan in l997. While not actually laws, these regulations or codes are nevertheless enforceable under the law. In l997, the Civil and Criminal Codes were amended with new articles concerning breaches of the environmental legislation, which made it a crime to break the environmental codes. Finally, in l998, the ministry of Ecology and Natural Resources and Environmental Protection drafted regulations on the 'Licensing Activities on the Use of Natural Resources,' which has been submitted to the government.

Major laws and regulations with impacts on biodiversity conservation.

The "Law on Protection, Reproduction, and Use of Fauna" is one of two laws that regulates biodiversity conservation (the "Law on Specially Protected Territories" is the other). The Law on Fauna requires wildlife to be sustainably utilized and makes provision for additional regulations to be promulgated as needed.

Among the regulations of the Government of the Republic of Kazakhstan that are related to conservation and balanced use of biological diversity, the following acts should be noted:

"On measures of the development of state conservancy areas and national natural parks in the Republic of Kazakhstan," dated July 14, 1993, # 607.

"On approval of the Convention of biological diversity by the Republic of Kazakhstan and ensuring implementation of the stipulated obligations," dated August 19, 1994, # 918.

"On approval of the list of water reservoirs stated as those of special national importance, special scientific value which might be restricted or fully prohibited in management," dated March 1995, # 218.

"On approval of the order of state registration of fauna and keeping the state cadastre of fauna in the territory of the Republic of Kazakhstan," dated August 1995, # 1153. This decree concerns the identification and inventory of animal species, including updated information on geographical distribution, status and numbers, characteristics of habitat, economic value, and other data for providing protection and rational use of animal populations.

"On approval of the list of species and sub-species of animals included into the Red Data Book of the Republic of Kazakhstan, list of the animals permitted for hunting in the Republic of Kazakhstan and list of the animals permitted for hunting in the Republic of Kazakhstan on the licenses," dated August 21, 1995, # 1152.

"On approval of the provision of the Red Data Book of the Republic of Kazakhstan," dated September 13, 1995, # 1258.

In addition to the foregoing, approximately 90 laws and codes cover a wide range of environmental and natural resource issues, including the establishment of individual protected areas. However, for the most part, implementing regulations have not been developed, and enforcement capacity is low. Together with more than 300 environmental organizations involved in environmental management, their activities are regulated under the law on "Public Associations" of l996, and the "Law on Environmental Protection" of l997.

C. Institutional Framework

C1. Government Agencies

The Ministry of Ecology and Natural Resources (MNREP) is responsible for framing and implementing Kazakhstan's environmental and natural resources policy. The MNREP's National Environmental Center for Sustainable Development (NEC/SD) coordinates environmental project preparation and organizes monitoring for MNREP. The MNREP, through its Forestry, Fishing, and Hunting Committee (FFHC), is responsible for all biodiversity management issues. In cooperation with local and oblast-level akhimats, the FFHC's Department of Protected Areas is responsible for managing most of the system of reserves.

Kazakhstan's agricultural sector significantly affects the quality of the country's wetland biodiversity. However, little provision is made under current agricultural laws to officially recognize this impact and develop policies to mitigate it. The "Law on Land," passed in 1995, specifies how Kazakhstan will approach the privatization of land and other natural resources. The Ministry of Agriculture's (MoA) Committee on Land Resources (CLR) is responsible for the nationwide development of cadastre, as well as the regulations and standards for sustainable land use.

In 1993, Kazakhstan passed a revised law on water rights and water management in Kazakhstan. The new law, entitled "Water Code of the Republic of Kazakhstan" declares that all water resources in Kazakhstan are the property of the State. The Code gives water management responsibility in Kazakhstan to the Committee on Water Resources (CWR) through MNREP's oblast-level departments and their links with local communities. The CWR is responsible for developing and implementing new water management-related laws to manage Kazakhstan's freshwater resources sustainably and equitably. As part of CWR's work, local Water Users Associations are being established in select areas throughout Kazakhstan.

The institutional configuration among and within the government agencies responsible for environment and natural resources has created a climate of uncertainty and low morale among many staff. To counter proposed staff and budget reductions, day-to-day management of natural resource management has shifted from a centrally driven management system to the regions. However, regional staff and budget allocations have not increased concomitantly, further reducing morale and management capacity.

The NBSAP and the NEAP both call for strengthening of the institutional capacity of the governmental departments and ministries of Kazakhstan. This can be directly translated into the need for sufficient and reliable budgets; no amount of planning of national initiatives can succeed if the implementing agencies are insufficiently and spasmodically funded. The mandates

and responsibilities of the different agencies, as well as the legislative base for their activities, should be reviewed and recommendations made to rationalize the needed changes.

C2. Academic Institutions

The Kazakh Academy of Sciences, together with the Institutes of Zoology and Botany, was well supported under the Soviet system, carrying out extensive "field expeditions" to collect data on species and habitats. However, in the years since independence, funding was drastically reduced, and last year the Academy of Sciences was abolished and the scientific institutes were designated state enterprises. Scientists are still members of scientific societies, such as the Kazakhstan-Central Asia Zoological Society, Kazakh Botanical Society, and Kazakh Geographical Society. Some of these societies include specialists working outside of Kazakhstan, such as the Kazakhstan-Central Asia Zoological Society, which publishes its own journal "Selevinia," documenting the status of the fauna of Kazakhstan and other Central Asian states. Another scientific organization, Tethys Society, plans and implements biodiversity-related projects and produces its scientific journal "Tethys Entomological Research." Both Kazakhstan-Central Asia Zoological Society and Tethys Society are members of IUCN.

C3. Non-governmental Organizations (NGOs)

There are more than 1,000 registered NGOs in Kazakhstan. Of these, only ten percent have solid expertise in environmental or biodiversity issues. The effective ones are comprised of former academicians who have been forced to seek other employment and have grouped together to form NGOs to carry on work in their respective fields. These "scientific" NGOs, which lack of capacity of the traditional institutions and agencies, are carrying out inventory and monitoring work through GEF Small Grant project funding.

Such organizations include "Ecocenter" and "Ecomuseum" in Karaganda, "Naurzum" in the Naurzum zapovednik in Kostanai oblast, "Wild Life" in South-Kazakhstan oblast, and "Belovodie" in Ust'-Kamenogorsk. Among NGOs registered and working actively in the city of Almaty are: Green Salvation, Public Centre Biodiversity Protection in Kazakhstan, Koryk, Tabigat, ENVIRS, National Ecological Society, and KAZDIN.

C4. Internationally supported Biodiversity Conservation Projects

Several biodiversity conservation projects operate in Kazakhstan through the support of international organizations. The National Report of the Republic of Kazakhstan on Conservation and Sustainable Use of Biological Diversity of l998, was sponsored by UNDP and the Global Environmental Facility (GEF), both of which also funded the NEAP and the NSAP. The Caspian Environmental Program (CEP), funded by GEF and implemented by the World Bank, brings together the five littoral Caspian countries to identify transboundary environmental issues. With the World Bank, the European Union-TACIS program supports various transboundary projects, for example, the Aral Sea and the Western Tien-Shan transboundary biodiversity project. Additionally, multilateral and bilateral donors support initiatives in conservation and sustainable usage of biological diversity through small grant programs.

Regional cooperation in the field of environmental protection (including biological and landscape diversity) was discussed in detail during the regional meeting of the Environment ministers of the Central Asia on April 22, 1998 in Almaty. During this meeting, the Ministers reaffirmed their commitment to environmental cooperation and intent to design a regional program for environment, establishing a Regional Environment Centre (REC) with a network of national branches throughout the region. The Ministers also affirmed their wish to deepen ongoing integration into the "Environment for Europe" process, promote regional cooperation, and develop solutions for environmental problems in the region in accordance with the initiatives and programs carried out at the pan-European level.

The preparation of a Regional Environment Action Plan (REAP) would allow for the production of a regional information system, the analysis of environmental problems, the identification of regional priorities, and the design of regional projects. Regional cooperation in Central Asia in environment protection will be the basis for a regional sustainable development strategy.

Projects being implemented by international intergovernmental organizations and financial institutions that call for natural environment rehabilitation and biological diversity conservation in Kazakhstan include:

- *The Framework Ecological Programme for Sustainable Development of the Republic of Kazakhstan* implemented jointly with MNREP and UNDP (US$ 516,000). The goal of the program was to: improve the capacity of Government of the Republic of Kazakhstan in ecological management, including the support in the development of the National Environmental Action Plan for Sustainable Development and accomplishment of the provisions of Conventions concerning environment protection; help prepare and implement ecological projects in the regions of priority ecological problems; develop NGOs to strengthen public participation in environment protection; and establish adequate national ecological policy for more rapid sustainable development.

- *Project of the World Bank on Improvement of Institutional Capacity of Management and Planning in the Field of Environment protection* (US$ 399,000), being carried out by MNREP and its NEAP/SD Centre, in cooperation with other organizations.

- *Support of development of the National Environmental Actions Plan in Central Asian region* rendered by Harvard Institute for International Development (US$ 12,000).

- *Support of development of the NEAPs in the newly independent states and Mongolia* by EU/TACIS (US$ 40,000).

- *Project on the Development of the Strategy to implement the Convention on Biological Diversity* implemented by MNREP with GEF/UNDP (US$ 314,000). The principal elements of the project included: the establishment of an inter-sectoral coordination body; biodiversity assessment on basis of existing knowledge; identification and agreement of options for biodiversity management and benefit-

sharing through a process of analysis and consultations; preparation of a biodiversity strategy and action plan; and preparation and dissemination of the national report.

- *Central Asian Transboundary Project on Conservation of Biological Diversity of Western Tien-Shan,* the preparatory phase of it being completed by the Governments of the Republic of Kazakhstan, the Kyrgyz Republic, and the Republic of Uzbekistan with the use of GEF fund (US$ 345,000) and Know-How Fund of the Government of UK (US$ 240,000). The Council of GEF approved the request of three Central Asian states for US$ 10 million grant to finance the first five-year phase beginning in 2000. This project is aimed at improved biodiversity conservation in the region, focusing on existing and planned protected areas with local community participation. The project envisages the development of regional program of small grants (US$ 500,000) to support NGO and local community initiatives.

- *In-situ Conservation of Mountain Agrobiodiversity in Kazakhstan*, GEF/UNDP project currently in the design phase. The project is focusing on the development of a public-private partnership that builds a sustainable, *in-situ* conservation and utilization program for Kazakhstan's mountain agrobiodiversity. The full project will support *in-situ* conservation of crop wild relatives and increased conservation within agricultural systems. These goals will be achieved by strengthening management of protected areas and priority habitats and developing markets for traditional varieties and farmer extension work on traditional variety management. The private agricultural industry will be viewed as a source of support for sustainable management of agrobiodiversity resources, and innovative linkages between the two will be explored.

- *Integrated Conservation of Priority Globally Significant Migratory Bird Wetland Habitat,* GEF/UNDP-supported project design completed successfully in 2000. It has identified opportunities in Kazakhstan to conserve globally significant wetland habitats in three areas. The approach of the resulting full project should be to integrate conservation and development to improve the sustainability and effectiveness of priority wetland habitat management. New management tools will be demonstrated to overcome existing barriers to the sustainable conservation and use of biological resources in critical globally significant wetland habitat areas.

- *Programme of Small Grants* of UNDP/GEF (more than US$ 500,000 since 1997), aimed to improve conservation and sustainable use of biological diversity by local communities, including increased capacity for the use of renewable or efficient energy sources. It calls for enlarging the range of initiatives supported by GEF at local community level and creating the basis for a long-term and stable financial program.

- *Technical Assistance Project of the World Bank to the Republic of Kazakhstan*, aimed at enforcing the legislative-institutional basis of nature protection sector. For realization of the project, there were assigned US$ 1.475 million.

- *Greenhouse Gas Study and Kazakhstan Climate Change*, financed by the Agency of Environmental Protection, USA (US$ 122,000).

- *Development of the National Climate Change Action Plan*, financed by USAID (US$ 80,000).

- *Project on the Development of National Combat Desertification Action Plan*, financed by UNEP (US$ 40,000).

WWF, with the participation of Central Asian experts, published a biodiversity assessment for Central Asia, focusing on the contemporary status of biological diversity and its conservation in different states. It proposed a series of investment projects, primarily related to protected areas and species conservation plans.

SECTION V

Summary of Findings

1. Kazakhstan's biodiversity is globally and regionally important because of its biogeographical location between northern European, Asian, and Middle Eastern floral and faunal regions, it large size and variety of ecosystems (high mountain ranges, steppes, deserts, wetlands, Caspian Sea), the presence of internationally important populations of rare and threatened species of flora and fauna (often with restricted distributions), and its importance as a migratory crossroads.

2. Major threats to biodiversity include:

    - Degradation of natural landscapes and shrinking of natural habitats as a result of the expansion of industry and agriculture, including overgrazing, in recent years
    - Poor water and soil management practices, leading to desertification, aridization, and salinization
    - Pollution from unregulated exploitation of petroleum and mineral deposits, and other industrial activities (airborne pollution increasing susceptibility of natural forests to disease)
    - Heavy metal contamination
    - Unregulated forest exploitation (notably for gallery *tugai* forests) and hunting, particularly for large mammals
    - Unregulated fires and lack of fire control and management

3. The protected-area system in Kazakhstan is based on the Soviet-style, strict protected area model. It provides inadequate representation of the country's biodiversity, particularly for steppe and wetland ecosystems. Because of the extensive nature of some ecosystems, such as steppes, strict protected areas are unlikely to cover some important areas, such as wetlands, and may be inadequate to allow for migratory patterns of birds and large mammals. Clearly an approach that combines protected areas with wider, improved natural resources and land-use management practices is called for.

4. Kazakhstan environmental and biodiversity strategy has been outlined by National Environmental Action Plan, the National Biodiversity Strategy and Action Plan (NBSAP), and several regional programs such as the Aral and Caspian Seas. It remains unclear whether the programs and priorities under these initiatives are internally consistent. However, several programs have currently reached implementation stage. Due to insufficient government funding under the new economic conditions of this transitional period and the lack of donor support, many projects remain paper exercises. The NEAP framework supports some policy adjustments, but long-term regional scale monitoring programs, coordination of the programs between the countries, and participation of Kazakhstan in transboundary monitoring are needed.

5. Progress has been made on the development of a policy and regulatory framework for the environment, including biodiversity conservation, but detailed implementation guidelines that are adapted to local realities are still being worked out (promoting the reinvestment of locally-generated resources, such as from ecotourism and park fees) into improved management of those resources and benefit sharing with local communities.

6. Information on biodiversity is well developed in Kazakhstan but is mostly confined to a small group of NGOs and academics. Integration and sharing of information exists. E-mail and internet remain expensive but accessible. In many cases, searchable websites or GIS-based maps exist. The Caspian biodiversity program is compiling a database on Caspian biodiversity. NGOs specializing in biodiversity issues are well represented and play a significant role, providing mapping, GIS, monitoring, species surveys, publishing, and educational activities (TERRA, TETHYS). They have developed Internet support and are advanced in information sharing compared to neighboring countries.

7. Government agencies responsible for environmental management, including biodiversity conservation, are still dominated by a centralized Soviet-style command and control mentality. However, outside of direct donor-supported initiatives, budget and resource allocations are insufficient at central and regional levels to support the needed management capacity. Many government scientists have formed or adapted NGOs as a response to donor interest in supporting non-governmental initiatives, potentially taking human resources further away from governmental functions. However, relatively few environmental NGOs in Kazakhstan have the real capacity to develop and implement programs. There is an appreciation of the need for public-private partnerships and enterprise development but no clear ideas on how this might be achieved in the country. Consideration should be given to moving toward more sustainable management arrangements using incentive-based systems that involve public participation.

8. Awareness and understanding of biodiversity issues remain low. Biodiversity is perceived as the domain of academic scientists. The improvements witnessed in recent years, which are primarily due to the efforts of environmental NGOs, are just a beginning and much remains to be done, particularly with respect to biodiversity conservation. This extends from improving the understanding of biodiversity conservation and its importance in economic and social development by decision makers and politicians, to linking biodiversity conservation to immediate, day-to-day needs of local populations.

9. Much of the discussion and activity related to biodiversity conservation has focused on broad frameworks for action, has been largely government driven (with input and support from NGOs and donors), and has been mostly confined to the capital. There is an urgent need to move this process “downward” to involve local authorities, communities, and CBOs in dialogue and to develop local initiatives that demonstrate success and inform the ongoing policy discussion.

10. There is an opportunity to bring together government agencies, NGOs, and private-sector organizations to discuss and examine alternative methods and approaches that emphasize partnerships and co-management of resources, and explore incentive-based management

systems rather than strict enforcement models, for which resources and capacity are likely to remain low. This can be done through joint training, study visits, pilot initiatives, and regional partnerships linking neighboring countries to learn from experiences elsewhere, both regionally and internationally. Pilot community-based initiatives, where clear opportunities and willingness to undertake improved management and conservation activities exist, should be explored. Potential activities include integrated wetland management for improved water supply and quality (through, for example, natural filtration by riparian vegetation or controlled hunting and fishing), ecotourism development, protected area management, and improved grazing practices.

11. The role of regional organizations, such as the Regional Environmental Center, should be examined for the promotion of shared lessons and experiences and transboundary issues. At the same time, partnerships between NGOs in neighboring countries should be promoted to regional priority setting and information sharing, as well as on-ground transboundary initiatives in biodiversity conservation (including migratory species conservation).

12. The increasing petroleum activities in and around the Caspian Sea, an environmentally fragile area of high biodiversity importance, offer significant opportunities for incorporating environmental management and biodiversity conservation into economic development activities, by incorporating these issues early in the planning process and ensuring adequate monitoring. Opportunities also exist for increasing national and international awareness and developing site-specific management plans and species conservation planning (Caspian seal, sturgeon, waterfowl) as well as reinforcing the awareness of and commitments to international and regional treaties and conventions.

SECTION VI

Recommendations for Biodiversity Conservation

The following recommendations are offered to help Kazakhstan further along on the road to sustainable biodiversity conservation. A set of recommendations that is more specific to USAID and its program in Kazakhstan follows in Section VII.

1. Review the current protected-area system to assess its effectiveness in conserving representative elements of the country's biodiversity. This will:

    - Identify which ecosystems and species are poorly represented in the current protected-area system and which protected areas are inadequately designed (too small, boundaries not incorporating all elements) to represent the full array of individual ecosystem or species ranges

    - Assess the effectiveness of management regimes and capacity, to propose alternative or complementary management systems — for example, to include multiple use, community participation, private sector involvement (through ecotourism initiatives), and broad landscape approaches

    - Identify information gaps and needs related to the above

    This recommendation would build on the recommendations of the NBSAP and necessarily incorporate activities proposed under other projects, such as the Central Asia Transboundary Biodiversity project, the Critical Wetlands for Migratory Birds project, and the biosphere reserves proposals, supported by NABU and others.

2. Propose pilot landscape initiatives in fragile ecosystems, such as steppe habitats and *tugai* woodlands that combine improved habitat management with rehabilitation and restoration activities. Improved grazing and fodder production, sustainable forest management (including non-timber forest products), and multi-purpose wetland management are potential examples. This will require developing incentive-based systems to work with local communities, local governments, and technical managers

3. Develop management guidelines for fragile and vulnerable habitats that can be incorporated into environmental impact regulations for investment projects and policies. This could build on and expand existing inventories of such habitats, including forests and woodlands, wetlands, and alpine meadows. This could serve to promote the harmonization of environmental impact assessment (EIA) procedures, increase transparency, and support the development of a cadre of expert consultants in Kazakhstan to work on EIAs and monitoring.

4. Promote private-public partnerships for improved management in areas of high biodiversity importance. Lack of resources and capacity in government institutions is a key constraint to effective management of forests and protected areas. Major

infusions of resources into government agencies are not likely in the near future. New partnerships need to be sought with private investors. These could include oil and mining companies, and tourist operators as well as local businesses and communities. Experience from other countries may be able to inform this process, which will depend on an improved investment climate for Kazakhstan. This is a long-term process, and potentially successful demonstration initiatives should be promoted to provide examples and momentum.

5. Promote the role of environmental NGOs in awareness raising, environmental education, lobbying, community-based initiatives, and monitoring. Environmental NGOs are often at the forefront of these activities. Awareness raising and advocacy activities, although not always based on the best information, have nevertheless served to increase transparency regarding environmental issues. Because there are fewer "grassroots" environmental NGOs in Kazakhstan, there is a need to promote NGOs that can work with community groups on hands-on projects related to improved resource management.

6. Transboundary environmental regional biodiversity issues, through a transboundary coordinating committee. The role of regional organizations, such as the Regional Environmental Center, should be examined to promote shared lessons and experiences as well as transboundary issues. At the same time, partnerships between NGOs in neighboring countries should be promoted to regional priority setting and information sharing, as well as on-ground transboundary initiatives in biodiversity conservation (including migratory species conservation).

7. Promote training, exchange visits, cooperative programs and high-level delegations to increase understanding of biodiversity issues, share experiences, develop partnerships, and promote alternative approaches to biodiversity conservation, including better integration into wider environmental and development programs and policies. High-level commitment is needed to make this work. Regional cooperation and information sharing within the region will be very important, and the role and potential of the Regional Environmental Center needs to be assessed in this regard.

SECTION VII

USAID in Kazakhstan

A. Impact of USAID Program on Biodiversity

USAID's regional Mission in Central Asia includes an environmental strategic objective "improved management of critical natural resources, including energy." Intermediate results are:

- Increased management capacity in the natural resources sector
- Improved policy and regulatory framework for natural resources management
- Sustainable models developed for integrated natural resource management
- Public commitment established for natural resources management policies

While the program emphasizes natural resources, the focus is heavily oriented to water and energy, with "green" issues, such as forests, watershed protection, sustainable agriculture, and biodiversity, conspicuously absent. This appears also to apply to models of "integrated" natural resources management.

Although the effect of current and planned activities on biodiversity is not negative, and in fact is probably beneficial — through such proposed activities as oil field cleanup and environmental policy reform (global climate change, promotion of transboundary cooperation in water issues) — there remains a great potential to incorporate biodiversity issues into the proposed program at very little cost and potentially high impact. These are discussed below in section B., Recommendations.

USAID is also promoting civil society under its democracy strategic objective. In Aterau, ISAR is working with nascent environmental NGOs and community groups to strengthen capacity and build partnerships. Through the local resource center, training programs, and small grants, awareness of environmental and biodiversity issues is increasing and local government and civil society representatives are engaging in dialogue and environmental activities (such as "clean-up day for Ural River").

In addition, during the bilateral Joint Commission meetings between the governments of the U.S. and Kazakhstan in 2000, shared concern was expressed by both parties regarding the plight of the Caspian seal, subsequent to a recent die-off in Kazakhstan.

B. Recommendations

The majority of recommendations focus on SO 1.6, since this directly addresses natural resources management. There is also some discussion of other SOs that offer opportunity for improving biodiversity conservation and can provide the Mission staff with the opportunity to think about how other SOs potentially can have positive and negative impacts on biodiversity.

They also may help the Mission staff to identify easily implemented activities that will meet the requirements of more than one SO.

Strategic Objective 1.6 - Improved Management of Critical Natural Resources, including Energy

Protected areas play a critical role not only in biodiversity conservation but also improved natural resources protection and management throughout the region. Water management issues, for example, are one of the critical components of USAID interest in the region, as stated in SO 1.6. Particularly since water rights and water resource-sharing is of particular regional stability concern, an effective tool for developing a watershed management system may be to establish some appropriate category of protected area so that scientists and professional resource managers can be responsible for part of this water management process. USAID can play a valuable role in promoting commitment to establishing more functional protected areas. Well-managed protected areas can be the catalyzing force for establishing community-based management programs, protecting water sources, managing forest ecosystems, and educating the public on environmental issues. All of these programs entail improving natural resource management and, when combined, contribute to the overall conservation of biodiversity.

The mission might consider involvement in:

1. Support "twinning" relationships between U.S. and Kazakh institutions involved in biodiversity conservation. An example is the U.S. National Park Service, which has a similar cooperative agreement (with USAID funding under an interagency agreement) with the government of Georgia for training and exchange visits, as well as twinning of individual protected areas in each country. The latter could include "prairie" and mountain parks. A further example concerns universities and other academic institutions with expertise in marine conservation issues relevant to the Caspian Sea.

2. Continue support to ISAR for NGO and community group development and capacity building in Aterau, and possibly elsewhere. If appropriate consider supplementary funding for small grants and partnerships (such as sending local government staff and community/NGO leaders on joint training and study tours).

3. There is an opportunity to bring together government agencies, NGOs, and private sector organizations to discuss and examine alternative methods and approaches that emphasize partnership and co-management of resources and explore incentive-based management systems rather than strict enforcement models (for which resources and capacity are likely to remain low). This can be done through joint training, study visits, pilot initiatives, and regional partnerships linking neighboring countries to learn from experiences elsewhere, both regionally and internationally. Pilot community-based initiatives, where clear opportunities and willingness to undertake improved management and conservation activities exist, should be explored. Examples could include integrated wetland management for improved water supply and quality (through, for example, natural filtration by riparian vegetation or controlled hunting and fishing), ecotourism development, protected area management, and improved grazing practices.

4. The increasing petroleum activities in and around the Caspian Sea, an environmentally fragile area of high biodiversity importance, offer significant opportunities for incorporating environmental management and biodiversity conservation into economic development activities by incorporating these issues early in the planning process and ensuring adequate monitoring. Opportunities also exist for increasing national and international awareness, developing site-specific management plans and species conservation planning (for Caspian seal, sturgeon, and waterfowl) as well as reinforcing the awareness of and commitments to international and regional treaties and conventions.

5. The upcoming USAID CAR Environment and Energy project provides an excellent framework and opportunity for the integration of biodiversity conservation initiatives at low cost and potentially high impact and visibility, to broaden the Mission's development program. Examples include:

    - Wetland and riparian vegetation management as part of local water initiatives
    - Incorporating biodiversity in training and awareness programs
    - Including biodiversity in policy and legislative development and application
    - Considering biodiversity in monitoring and assessment in transboundary issues
    - NGO development

The following recommendations are linked directly to the recent CAR Regional Environment and Energy project procurement (where applicable, activities are linked to the illustrative activities (I.A.) referred to in the RFP).

1. Increase awareness by policy makers and technical managers of the benefits of an integrated natural resource management approach that emphasizes linkages and sustainability. As part of the proposed training for increased management capacity (I.A. #1), incorporate ecological principles into technical approaches. This could include the role of catchment forests in maintaining water quality and supply, the importance of vegetation in maintaining hydrological regimes, and the role of biodiversity in maintaining soil fertility. Since many of these issues are transboundary in nature, regional training and cooperation will be advantageous.

2. Incorporate biodiversity concerns into river basin management and monitoring, notably for the Syr Darya catchment (I.A. #3). Twenty endemic fish species are known from the Syr Darya drainage in southern Kazakhstan. Their range has been greatly reduced in recent years.

3. Support climate change research in relation to potential impacts on natural ecosystems and biodiversity distribution and conservation.

4. Incorporate biodiversity into environmental impact policies and legislation, as part of the regulatory framework for investment, such as in oil and gas exploration.

5. Develop integrated wetland management initiatives that promote the sustainability of ecological functions, including the continued provision of ecological goods and services, such as biodiversity conservation (I.A. #8). Community-based projects that promote sustainable management can provide opportunities to develop regional and local partnerships among communities, local government, and private-sector interests. Specific activities could include improved management of riparian vegetation for pasture and haymaking, as well as reeds for local construction and water quality improvement, fisheries and hunting, and possibly ecotourism enterprises. Initiatives can build on activities already programmed under the GEF integrated wetlands for migratory birds project, which includes the Ural River delta as a priority site.

6. Promote the prevention and rehabilitation of salinized soil through improved vegetation management and conservation, ecological improved irrigation, and better wetland conservation and management (I.A. #9). This provides another opportunity to develop local partnerships based on community-led initiatives.

7. Promote and support partnerships between oil and gas companies, local governments, and communities to improve monitoring of ecological conditions and biodiversity in the north Caspian region, including better understanding of the north Caspian ecosystem and collection of baseline data. This activity could be linked to the development of EIA guidelines for the industry and the region. It should also serve to leverage the efforts of other donors under the Caspian Environmental Program.

Strategic Objective 1.3 - Improved Environment for the Growth of Small and Medium Enterprises

Small and medium enterprises that encourage biodiversity conservation include ecotourism, sustainable forestry and the development and marketing of natural products, such as mushrooms, nuts, and bulb flowers. However, other enterprises can have a potentially negative impact on the environment and biodiversity. One way to mitigate these is through the development and improved monitoring and enforcement of environmental guidelines for enterprises, including EIA and environmental management systems.

Strategic Objective 2.1 - Strengthening Democratic Culture Among Citizens and Target Institutions

One of the findings was the relative vibrancy of Kazakhstan's non-governmental organizations, particularly in their technical capacity (managing databases, geographic information systems). This could be developed and extended through support to regional NGO training workshops. In addition, there is an opportunity to strengthening NGOs capabilities so that they can assist with some of the forestry and protected area management responsibilities currently under government control. Given their database skills and advanced regional information-sharing systems, NGOs in Kazakhstan may be able to help the government develop better management tools and practices. Supporting NGOs, which are by nature often run by local groups with interest in the community,

has some direct and indirect effects on encouraging a civil society that participates in democratic processes. These activities potentially could be included as part of the SO 2.1 portfolio.

Strategic Objective 2.3 - More Effective, Responsive, and Accountable Local Governance

This SO points specifically to Kyrgyzstan and Kazakhstan as the only two countries within the region where the enabling environment (for local government improvement) is promising. Part of this SOs proposed program is for NGOs to manage some services (such as selected ecosystems or protected areas) with local government oversight. As USAID states in its SO 2.3, NGOs are often better at managing services.

Because of problems with government capacity, there is a significant policy implementation failure as a result. USAID can offer assistance to strengthen enforcement capacity for environmental regulations. Such an activity could be one component of improving the country's protected area management system and developing a substantial environmental agency. It is conceivable that some of these capacity problems can be addressed by SO 2.3.

Sec. 117.[68] Assistance for Disadvantaged South Africans.— * * * [Repealed—1993]

Sec. 117.[69] Environment and Natural Resources.—(a) The Congress finds that if current trends in the degradation of natural resources in developing countries continue, they will severely undermine the best efforts to meet basic human needs, to achieve sustained economic growth, and to prevent international tension and conflict. The Congress also finds that the world faces enormous, urgent, and complex problems, with respect to natural resources, which require new forms of cooperation between the United States and developing countries to prevent such problems from becoming unmanageable. It is, therefore, in the economic and security interests of the United States to provide leadership both in thoroughly reassessing policies relating to natural resources and the environment, and in cooperating extensively with developing countries in order to achieve environmentally sound development.

(b) In order to address the serious problems described in subsection (a), the President is authorized to furnish assistance under this part for developing and strengthening the capacity of developing countries to protect and manage their environment and natural resources. Special efforts shall be made to maintain and where possible to restore the land, vegetation, water, wildlife, and other resources upon which depend economic growth and human well-being, especially of the poor.

(c)(1) The President, in implementing programs and projects under this chapter and chapter 10 of this part,[70] shall take fully into account the impact of such programs and projects upon the environment and natural resources of developing countries. Subject to such procedures as the President considers appropriate, the President shall require all agencies and officials responsible for programs or projects under this chapter—

(A) to prepare and take fully into account an environmental impact statement for any program or project under this chapter significantly affecting the environment of the global commons outside the jurisdiction of any country, the environment of the United States, or other aspects of the environment which the President may specify; and

(B) to prepare and take fully into account an environmental assessment of any proposed program or project under this chapter significantly affecting the environment of any foreign country.

Such agencies and officials should, where appropriate, use local technical resources in preparing environmental impact statements and environmental assessments pursuant to this subsection.

(2) The President may establish exceptions from the requirements of this subsection for emergency conditions and for cases in which compliance with those requirements would be seriously detrimental to the foreign policy interests of the United States.

Sec. 118.[71] Tropical Forests.

(a) IMPORTANCE OF FORESTS AND TREE COVER.—In enacting section 103(b)(3) of this Act the Congress recognized the importance of forests and tree cover to the developing countries. The Congress is particularly concerned about the continuing and accelerating alteration, destruction, and loss of tropical forests in developing countries, which pose a serious threat to development and the environment. Tropical forest destruction and loss—

(1) result in shortages of wood, especially wood for fuel; loss of biologically productive wetlands; siltation of lakes, reservoirs, and irrigation systems; floods; destruction of indigenous peoples; extinction of plant and animal species; reduced capacity for food production; and loss of genetic resources; and

(2) can result in desertification and destabilization of the earth's climate.

Properly managed tropical forests provide a sustained flow of resources essential to the economic growth of developing countries, as well as genetic resources of value to developed and developing countries alike.

(b) PRIORITIES.—The concerns expressed in subsection (a) and the recommendations of the United States Interagency Task Force on Tropical Forests shall be given high priority by the President—

(1) in formulating and carrying out programs and policies with respect to developing countries, including those relating to bilateral and multilateral assistance and those relating to private sector activities; and

[68] Formerly at 22 U.S.C. 2151o. Sec. 117 was repealed by sec. 4(a)(3)(B) of the South African Democratic Transition Support Act of 1993 (Public Law 103-149; 107 Stat. 1505). It had been added originally by sec. 201(b) of Public Law 99-440 (100 Stat. 1094). Sec. 117 provided assistance for disadvantaged South Africans through South African nongovernmental organizations, such as the Educational Opportunities Council, the South African Institute of Race Relations, READ, professional teachers' unions, the Outreach Program of the University of the Western Cape, the Funda Center in Soweto, SACHED, UPP Trust, TOPS, the Wilgespruit Fellowship Center (WFC), and civic and other organizations working at the community level which did not receive funds from the Government of South Africa.

A previous version of sec. 117, "Infant Nutrition", was repealed in 1978.

[69] 22 U.S.C. 2151p. Sec. 117 was redesignated from being sec. 118 by sec. 301(1) of Public Law 99-529, resulting in the creation of two sections 117. Sec. 301(2) of Public Law 99-529 (100 Stat. 3014) further deleted subsec. (d) of that section, which dealt with tropical forests, and then sec. 301(3) of Public Law 99-529 added a new section 118 entitled "Tropical Forests". This section, as added by sec. 113 of Public Law 95-88 (91 Stat. 537) and amended by sec. 110 of Public Law 95-424 (92 Stat. 948) and sec. 122 of Public Law 96-53 (93 Stat. 949), was further amended and restated by sec. 307 of the International Security and Development Cooperation Act of 1981 (Public Law 97-113; 95 Stat. 1533). This section previously read as follows:

"Sec. 118. Environment and Natural Resources.—(a) The President is authorized to furnish assistance under this part for developing and strengthening the capacity of less developed countries to protect and manage their environment and natural resources. Special efforts shall be made to maintain and where possible restore the land, vegetation, water, wildlife and other resources upon which depend economic growth and human well-being especially that of the poor.

"(b) In carrying out programs under this chapter, the President shall take into consideration the environmental consequence of development actions.".

See also sec. 534 of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1990 (Public Law 101-167; 103 Stat. 1228), as amended, relating to "Global Warming Initiative".

See also sec. 533 of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1991 (Public Law 101-513; 104 Stat. 2013), as amended, relating to "Environment and Global Warming".

See also sec. 532 of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1993 (Public Law 102-391; 106 Stat. 1666), relating to "Environment".

[70] Sec. 562 of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1991 (Public Law 101-513; 104 Stat. 2026), added a new chapter 10 to part I of this Act, providing for long-term development in sub-Saharan Africa, and made a conforming amendment by inserting "and chapter 10 of this part" here.

[71] 22 U.S.C. 2151p-1. Sec. 118 was added by sec. 301(3) of Public Law 99-529 (100 Stat. 3014). See also footnote 69.

(2) in seeking opportunities to coordinate public and private development and investment activities which affect forests in developing countries.

(c) ASSISTANCE TO DEVELOPING COUNTRIES.—In providing assistance to developing countries, the President shall do the following:

(1) Place a high priority on conservation and sustainable management of tropical forests.

(2) To the fullest extent feasible, engage in dialogues and exchanges of information with recipient countries—

(A) which stress the importance of conserving and sustainably managing forest resources for the long-term economic benefit of those countries, as well as the irreversible losses associated with forest destruction, and

(B) which identify and focus on policies of those countries which directly or indirectly contribute to deforestation.

(3) To the fullest extent feasible, support projects and activities—

(A) which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and

(B) which help developing countries identify and implement alternatives to colonizing forested areas.

(4) To the fullest extent feasible, support training programs, educational efforts, and the establishment or strengthening of institutions which increase the capacity of developing countries to formulate forest policies, engage in relevant land-use planning, and otherwise improve the management of their forests.

(5) To the fullest extent feasible, help end destructive slash-and-burn agriculture by supporting stable and productive farming practices in areas already cleared or degraded and on lands which inevitably will be settled, with special emphasis on demonstrating the feasibility of agroforestry and other techniques which use technologies and methods suited to the local environment and traditional agricultural techniques and feature close consultation with and involvement of local people.

(6) To the fullest extent feasible, help conserve forests which have not yet been degraded, by helping to increase production on lands already cleared or degraded through support of reforestation, fuelwood, and other sustainable forestry projects and practices, making sure that local people are involved at all stages of project design and implementation.

(7) To the fullest extent feasible, support projects and other activities to conserve forested watersheds and rehabilitate those which have been deforested, making sure that local people are involved at all stages of project design and implementation.

(8) To the fullest extent feasible, support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing, including reforestation, soil conservation, and other activities to rehabilitate degraded forest lands.

(9) To the fullest extent feasible, support research to expand knowledge of tropical forests and identify alternatives which

will prevent forest destruction, loss, or degradation, including research in agroforestry, sustainable management of natural forests, small-scale farms and gardens, small-scale animal husbandry, wider application of adopted traditional practices, and suitable crops and crop combinations.

(10) To the fullest extent feasible, conserve biological diversity in forest areas by—

(A) supporting and cooperating with United States Government agencies, other donors (both bilateral and multilateral), and other appropriate governmental, intergovernmental, and nongovernmental organizations in efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis;

(B) whenever appropriate, making the establishment of protected areas a condition of support for activities involving forest clearance of degradation; and

(C) helping developing countries identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas.

(11) To the fullest extent feasible, engage in efforts to increase the awareness of United States Government agencies and other donors, both bilateral and multilateral, of the immediate and long-term value of tropical forests.

(12) To the fullest extent feasible, utilize the resources and abilities of all relevant United States Government agencies.

(13) Require that any program or project under this chapter significantly affecting tropical forests (including projects involving the planting of exotic plant species)—

(A) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and

(B) take full account of the environmental impacts of the proposed activities on biological diversity,

as provided for in the environmental procedures of the Agency for International Development.

(14) Deny assistance under this chapter for—

(A) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner which minimizes forest destruction and that the proposed activity will produce positive economic benefits and sustainable forest management systems; and

(B) actions which significantly degrade national parks or similar protected areas which contain tropical forests or introduce exotic plants or animals into such areas.

(15) Deny assistance under this chapter for the following activities unless an environmental assessment indicates that the proposed activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development:

(A) Activities which would result in the conversion of forest lands to the rearing of livestock.

(B) The construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands.

(C) The colonization of forest lands.

(D) The construction of dams or other water control structures which flood relatively undegraded forest lands.

(d) PVOs AND OTHER NONGOVERNMENTAL ORGANIZATIONS.—Whenever feasible, the President shall accomplish the objectives of this section through projects managed by private and voluntary organizations or international, regional, or national nongovernmental organizations which are active in the region or country where the project is located.

(e) COUNTRY ANALYSIS REQUIREMENTS.—Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of—

(1) the actions necessary in that country to achieve conservation and sustainable management of tropical forests, and

(2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

(f) ANNUAL REPORT.—Each annual report required by section 634(a) of this Act shall include a report on the implementation of this section.

Sec. 119.[73] Renewable and Unconventional Energy Technologies. * * * [Repealed—1980]

Sec. 119.[73] Endangered Species.—(a)[74] The Congress finds the survival of many animal and plant species is endangered by overhunting, by the presence of toxic chemicals in water, air and soil, and by the destruction of habitats. The Congress further finds that the extinction of animal and plant species is an irreparable loss with potentially serious environmental and economic consequences for developing and developed countries alike. Accordingly, the preservation of animal and plant species through the regulation of the hunting and trade in endangered species, through limitations on the pollution of natural ecosystems, and through the protection of wildlife habitats should be an important objective of the United States development assistance.

(b)[74] In order to preserve biological diversity, the President is authorized to furnish assistance under this part, notwithstanding section 660,[75] to assist countries in protecting and maintaining wildlife habitats and in developing sound wildlife management and

[73] Sec. 119, as added by Public Law 95–88 (91 Stat. 528), amended by sec. 111 of the International Development and Food Assistance Act of 1978 (92 Stat. 948), and by sec. 107 of the International Development Cooperation Act of 1979 (93 Stat. 362), was repealed by sec. 304(g) of the International Security and Development Cooperation Act of 1980 (Public Law 96–533; 94 Stat. 3147). See sec. 106 of this Act for text concerning energy technologies.

[74] 22 U.S.C. 2151q.

[74] Sec. 119, para. (a) and (b) were added by sec. 702 of the International Environment Protection Act of 1983 (title VII of the Department of State Authorization Act, Fiscal Years 1984 and 1985, Public Law 98–164; 97 Stat. 1045).

[75] Section 533(d)(4)(A) of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1990 (Public Law 101–167; 103 Stat. 1227), added "notwithstanding section 660" at this point.

plant conservation programs. Special efforts should be made to establish and maintain wildlife sanctuaries, reserves, and parks; to enact and enforce anti-poaching measures; and to identify, study, and catalog animal and plant species, especially in tropical environments.

(c)[76] FUNDING LEVEL.—For fiscal year 1987, not less than $2,500,000 of the funds available to carry out this part (excluding funds made available to carry out section 104(c)(2), relating to the Child Survival Fund) shall be allocated for assistance pursuant to subsection (b) for activities which were not funded prior to fiscal year 1987. In addition, the Agency for International Development shall, to the fullest extent possible, continue and increase assistance pursuant to subsection (b) for activities for which assistance was provided in fiscal years prior to fiscal year 1987.

(d)[76] COUNTRY ANALYSIS REQUIREMENTS.—Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of—

(1) the actions necessary in that country to conserve biological diversity, and

(2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

(e)[76] LOCAL INVOLVEMENT.—To the fullest extent possible, projects supported under this section shall include close consultation with and involvement of local people at all stages of design and implementation.

(f)[76] PVOs AND OTHER NONGOVERNMENTAL ORGANIZATIONS.—Whenever feasible, the objectives of this section shall be accomplished through projects managed by appropriate private and voluntary organizations, or international, regional, or national nongovernmental organizations, which are active in the region or country where the project is located.

(g)[76] ACTIONS BY AID.—The Administrator of the Agency for International Development shall—

(1) cooperate with appropriate international organizations, both governmental and nongovernmental;

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

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

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

(5) whenever possible, enter into long-term agreements in which the recipient country agrees to protect ecosystems or other wildlife habitats recommended for protection by relevant governmental or nongovernmental organizations or as a result of activities undertaken pursuant to paragraph (6), and the

[76] Para. (c) through (h) were added by sec. 302 of Public Law 99–529 (100 Stat. 3017).

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

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

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

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

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

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

(h)[76] ANNUAL REPORTS.—Each annual report required by section 634(a) of this Act shall include, in a separate volume, a report on the implementation of this section.

ANNEX B

Scope of Work: Country Biodiversity Assessments Central Asia

I. Objective:

To conduct country-wide assessments of biodiversity resources and their status for the purposes of complying with sections 117 and 119 of the Foreign Assistance of 1961, Agency guidance on country strategy development, and USAID Environmental Procedures described in Title 22 CFR, Section 216.

II. Background:

A. Policies governing Environmental Procedures

The Foreign Assistance Act (FAA) of 1961, Sec. 498C states that funds made available for assistance to the New Independent States (NIS) shall be subject to the provisions of Section 117 relating to Environment and Natural Resources (FAA Sec. 498C, footnote e). Section 117 requires that the President take fully into account the impact of foreign assistance programs and projects on environment and natural resources (Sec 117 (c)(1)). Current USAID Legislation which guides environmental impact and monitoring is Title 22 of the Code of Federal Regulations, Part 216 ("Reg. 216"). In complying with the law, USAID provides its Environmental Procedures under ADS 204.5 to ensure accordance with the requirements of Title 22 CFR 216.

Section 119 of the FAA relates to Endangered Species. It states that "the preservation of animal and plant species through the regulation of the hunting and trade in endangered species, through limitations on the pollution of natural ecosystems and through the protection of wildlife habits should be an important objective of the United States development assistance (FAA, Sec. 119 (a))." Furthermore it states that "Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of (1) the actions necessary in that country to conserve biological diversity and (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified (FAA, Sec. 119(d)."

For USAID Missions to be in compliance with the above, and for USAID Missions to effectively determine impact on natural resources and endangered species and incorporate mitigation measures in their programs, a biodiversity assessment is needed to inform Mission planning. The purpose of this Task Order is to provide the USAID/CAR Regional Mission in Central Asia with this critical information.

B. Overview on USAID programs in Central Asia

The USAID Regional Mission for Central Asia (USAID/CAR) manages U.S. assistance in five newly independent states of Kazakhstan, Turkmenistan, Kyrgyzstan, Tajikistan and Uzbekistan.

USAID's assistance focuses on the economic, political, social, and environmental aspects of the transition process to more open, free market, democratic societies. Kazakhstan and Kyrgyzstan have full range of U.S. assistance. In Uzbekistan and Turkmenistan, the range of assistance is more limited by the pace of reform. In Tajikistan, USAID assistance primarily supports the reconciliation process after a civil war. Training, partnerships, and technical assistance are essential elements of all USAID/CAR programs. USAID/CAR provides considerable technical expertise through a network of specialized contractor and grantee partners.

Summary of Energy and Environmental Initiatives

The majority of USAID's work in the energy and environment sectors in Central Asia is regional rather than country-specific. This is because many of the energy and environmental challenges defy resolution at the national level — the associated problems cross national boundaries. Consider, for example, the relationship electricity and water: most of the major hydro-electric dams are in one country, the primary electricity dispatch center is in another, the power purchaser may be in third, agricultural irrigation takes place in a fourth and a fifth nation, and chief river routes thread through all five of the Central Asian countries of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. Energy, water and environmental officials throughout the region face many of the same problems as they look to market-based solutions for answers.

USAID's energy sector objective has been to establish a more economically sound and environmentally sustainable energy system as an engine of regional economic growth. Energy, covers oil and gas, as well as electricity. Patterns of energy sector investment and energy use in Central Asia will significantly influence the future political and economic independence of the region from Russia. If used strategically, these investment and use patterns could hasten Central Asia's emergence as a major petroleum producer in the 21st century — rivaling the Gulf region in its importance as an internal oil and gas market.

In the broader environment sector, USAID seeks to reduce regional economic and political tensions generated by transboundary environmental issues. These include the many aspects of sustainable water management in the Aral Sea Basin, environmental protection of the Caspian Sea, and reductions in pollution which contribute to global climate change.

Kazakhstan

Resource-rich Kazakhstan, with vast reserves of oil, gas and minerals, stretches from Mongolia to the Caspian Sea yet has a population of merely 16.5 million. Kazakhstan is the most politically and economically stable republic within Central Asia. Although traditionally a nomadic culture, Soviet policies led to a sedentary population that is more ethnically diverse and urban. Since gaining independence in 1991, President Nursultan Nazarbayev has been this constitutional republic's central political figure. Power is centralized within the presidency, although there is a Cabinet of Ministers and a Parliament. Nazarbayev recently relocated the capital to the northern city of Astana (formerly known as Aqmola) even though Almaty remains the cultural and economic center of the country.

In Kazakhstan, USAID promotes the integrated development and economically efficient operation of regional electric power systems, assists the Ministry of Oil and Gas and the state energy companies in oil and gas investment issues, supports region-wide cooperation in sustainable water resource management, and works to improve the capability for environmental management in both pollution mitigation and global climate change areas.

Kyrgyzstan

The small mountainous Kyrgyz Republic situated just south of Kazakhstan hosts the alpine grandeur of the Tien Shan Mountains and the serenity of Issyl-Kul, an inland sea nested between two mountain ranges. Much of the country was closed to foreigners during Soviet times due to the top-secret mining and weapons development facilities located here. Since the declaration of independence in December 1991, Kyrgyzstan has been working closely with international donors and making steady progress in political, social and economic reforms.

USAID support for economic transition initially focused on short-term and later stabilization measures designed to help bring government spending and inflation under control, shifted its focus to key structural reforms. This has included support for privatization of small- and medium-sized enterprises, establishment of financial markets, banking reform, fiscal reform, and development of an appropriate legal infrastructure for commercial activities. In 1998, with significant USAID technical assistance, Kyrgystan became the first Central Asian country to accede to the World Trade Organization.

In Kyrgyzstan, USAID promotes the integrated development and economically efficient operation of regional and national electric power systems, supports region-wide cooperation in sustainable water resource management, and works to improve capability for environmental management.

Tajikistan

Although Tajikistan achieved independence in 1991 with the break-up of the Soviet Union, independence brought widespread civil war to the nation. Tajikistan is the sole country among the five Central Asian states where underlying ethnic, regional, economic, and ideological strife led to civil conflict and caused major population displacements. Civil war broke out between rival clans in 1992 – 1993 and continued intermittently even after formal Peace Accords were signed in Moscow in June 1997.

Civil unrest by rival factions, however, continues to pose a challenge to continuing peace in the republic. Geographic isolation, dependence on food and industrial suppliers from beyond its borders, the elimination of most subsidies from Moscow, and the collapse of former trading relationships have all combines to create instability, with implications for other states in the region.

Currently U.S. government assistance in Tajikistan focuses primarily on humanitarian assistance and promotion of the peace process. Opportunities for longer-term impact are also made when appropriate. Much of the international assistance to Tajikistan has been carried out through U.N.

humanitarian programs, other U.N. agencies, the International Red Cross and other international and American PVOs.

The ultimate challenge in Tajikistan for any development program is to resolve the current security situation. Until this issue is resolved, any progress towards the mission's objectives will be limited.

Turkmenistan

A primarily desert country, Turkmenistan borders the Caspian Sea and has substantial oil and gas reserves. However, getting the oil and gas to market remains a significant obstacle. President Saparmund Niyazov is the highly visible authoritarian leader of Turkmenistan. Even though the constitution provides for a balance of powers, the legislative and juridical branches are in effect powerless. Since gaining independence in 1991, the government has resisted introducing political and economic reforms. As Turkmenistan has not experienced a sharp decline in living standards, the government has had little incentive to undertake the economic reforms necessary to become a market economy.

The USAID portfolio in Turkmenistan focuses on mutually agreed upon activities, wherein the Mission can introduce and implement reforms as well as improve the investment environment for local and international businesses. Specific programs in budgetary reform, trade and investment are currently in operation, as is support for energy sector, with an emphasis on gas and oil. In health programs, USAID introduced modern clinical services, including reproductive health and disease surveillance, and facilitates a medical partnership program. USAID also supports fledging NGOs and community-based organizations in an effort to promote citizen involvement in civic life. Technical training is designed to support the specific activities in which USAID is involved.

Uzbekistan

Uzbekistan, which borders all four other Central Asian republics, boasts many of the historical and architectural highlights of the region. The country has the most diverse economic resources in the region, including agriculture, mining and industry. Officially, Uzbekistan is a secular, democratic presidential republic with a President, cabinet of Ministers and a legislative body.

The USAID portfolio in Uzbekistan focuses on economic, democratic, and social aspects of the transition process, as well as the environment and energy sectors. From a USAID perspective, the goal in Uzbekistan is to engage reform-minded elements in the government and assist as requested in the establishment of the basic building blocks of a market-oriented economic system. Assistance for the market transition involves support or tax reform, budget reform, bank reform, accounting conversion and development of a strong, open and transparent investment climate.

Energy and environment initiatives support specific programs in privatization and development of energy and water resource policies which foster international trade and investment, reduce regional tensions, and increase social stability and environmental sustainability.

III. Statement of Work

The Contractor shall perform the following activities:

A) Hold meetings with the Bureau Environmental Officer (BEO) of USAID's EE Bureau in Washington and the EE Desk Officer and other suggested by the Desk Officer to ensure full understanding of EE's program in Central Asia, USAID environmental procedures and purpose of this assignment. These discussion should include any policy decisions and approaches which the BEO and Agency Environmental Advisor are taking as per their authority under Reg. 216, which may not be explicit in general legal documentation. The Contractor should also meet with a representative of EE's energy division familiar with the CAR program as well as with a representative of the Bureau's democracy and governance office to cover to civil society-related issues. The Contractor should also include meetings with relevant World Bank officials and with appropriate international conversation NGOs .

B) The Contractor should review materials provided by USAID to become familiar with the internationally funded Caspian Environment Program and especially the activities of its regional thematic centers whose work affects bio-resources in Kazakhstan and Turkmenistan. These are existing host-country institutions, each of which have been provided funding to summarize current understanding of an important Caspian Sea environmental issue. These include sea-level rise (Almaty), desertification around the Caspian (Turkmenistan), biodiversity (Almaty), and commercial bio-resources (Astrakhan, Russia).

C) Field a team to conduct an overview and general analysis of each country's biodiversity and its current status. The documentation should include description of:

- Major ecosystem types highlighting important, unique aspects of the country's biodiversity, including important endemic species and their habitats.

- Natural areas of particular importance to biodiversity conservation, such as key wetlands, remaining old-growth or coastal areas critical for species reproduction, feeding or migration, if relevant.

- Plant and animal species which are endangered or threatened with extinction. Endangered species of particular social, economic or environmental importance (such as the Caspian seal) should be highlighted and described, as should their habitats. An updated list, such as the IUCN red list should be included as an annex.

- Current and potential future threats to biodiversity including a general assessment of overall health of ecosystems and major factors affecting ecosystem health such as land use, pests, and/or contamination, etc. or major institutional or policy failures or transboundary issues as appropriate. Special attention should be given to the potential impacts from future oil and gas development, especially in the Caspian Sea region, and from changing patterns of transboundary water use.

- Conservation efforts including national policies and strategies, the status of financing for conservation, the status of country participation in major international treaties (with particular attention to the Convention on International Trade in Endangered Species – CITES), the country's protected area system, and botanical gardens/gene banks (if relevant) and their status, and monitoring systems. This section should also include recent, current and planned activities by donor and mulitlateral lending organizations (IFIs), international conservation NGOs, and agencies of the USG that support biodiversity conservation, including sustainable forestry, soil conservation, and efforts to combat desertification and establishment of parks. Identify NGOs, universities and other local organizations involved in conservation, and a general description of responsible government agencies. A general assessment of the effectiveness of these policies, institutions and activities to achieve biodiversity conservation should be included. Priority conservation needs which lack donor or local support should be highlighted.

- USAID's program in general and, if relevant, 1) any perceived potential areas of concern related to biodiversity impacts with current or planned program activities, or

- Any potential opportunities for USAID to support biodiversity conservation consistent with Mission program objectives.

D) For the CAR region prepare a report which incorporates the points above on the status of biodiversity and conservation efforts and implications for USAID programming and environmental monitoring to ensure compliance with 22 CFR 216.

IV. Methodology:

The Contractor shall field a two-person team of U.S. specialists for this assignment. One team member should be a natural resource management specialist with significant experience international, regional or Central Asia experience. The second team member should be a natural resources/institutional policy specialist with significant, relevant international, regional or Central Asia experience.

The Team Leader may have either of these specialties; however, he or she must have international experience with USAID and knowledge of USAID environmental regulations and programs. Additionally, the Team Leader must have proven leadership and communication skills (both oral and written), and preferably with relevant experience in USAID's E&E Bureau. The Team Leader should be a senior-level professional with minimum qualifications of Ph.D. or equivalent education plus 7 years additional relevant experience, or Masters plus 9 years additional relevant experience, or Bachelors plus 11 years additional relevant experience.

The second team member should be mid-level or well-qualified junior level professional. This specialist must have proven technical, analytical, and written communication skills, and have demonstrated his or her ability to work successfully in a team. Minimum requirements for a mid-level professional are Ph.D. or equivalent degree plus 3 years of relevant additional experience, or Masters plus 9 years additional relevant experience, or Bachelors plus 7 years

additional relevant experience. Minimum qualifications for a Junior-level specialist are Ph.D. or equivalent degree or Masters, or Bachelors plus one year additional relevant experience or 5 years experience. Potential contractors are asked to supply USAID/CAR with the names of the proposed U.S. specialists, indicating the Team Leader along with at least one alternate candidate named for each of the two positions.

USAID/CAR strongly encourages the use of qualified local professionals with command of the English language as additional team members for this assignment. With a large and varied geographic region to cover, comprising several independent nations, the addition of knowledgeable local specialists would considerably strengthen the team. In selecting such specialists, the Contractor should consider previous experience working with international donor projects, as well as technical knowledge and English language skills, as a key qualification.

Prior to beginning actual field work in the region, the Contractor shall submit an outline of a model country-wide biodiversity assessment to USAID/CAR to ensure that USAID and the Contractor have a common understanding of the approach to be taken in the preparation of the assessment, the depth of coverage expected, and the treatment of sensitive issues.

V. Deliverables:

The primary deliverable under this task order is a report on the CAR region, with discrete sections for each of the five countries, addressing the points specified in the statement of work. The report will contain country-specific findings and recommendations and also provide a regional context and recommendations. The report will contain at a minimum one map per country that provides a broad picture of key ecosystems, habitats and projected areas, one annex containing IUCN lists for endangered and threatened species, and one annex containing Sections 117 and 119 of the Foreign Assistance Act.

The second sets of deliverables are in-country Mission exit briefings accompanied by two-page written summaries of key findings and recommendations. One electronic copy in Word format of this assessment shall be provided to the USAID/CAR Mission as well CTO (Environmental Officer).

VI. Reporting Requirements:

The Contractor shall report to the USAID/CAR Mission Environmental Officer in Almaty, Kazakhstan for this overall assignment.

Anticipated Level of Effort (LOE) and Schedule:

The LOE for this assignment is a total of 176 expatriate person-days, assuming 2.5 weeks per country for a two-person U.S. team as follows:

- Meetings in Washington with USAID, World Bank, NGOs and other as relevant – to cover all five countries (3 person – days)
- Field assessment, analysis and Mission debriefing (15 person-days in each country, except Tajikistan. For Tajikistan is allocated 5 person-days)

- Report preparation (including incorporating USAID comments (12 person-days)

Additional LOE is provided for local experts (120 days), drivers (65 days) and interpreters (65 days).

Schedule: Work under this task order may begin immediately after its signing. Upon signing this task order, the Contractor shall coordinate with USAID/CAR to establish the timing for the field assessments with the USAID Mission.* A final schedule shall be developed for this task order and delivered to the USAID/CAR Mission Environment Officer no later than 2 weeks after the signing of this task order.

Logistics: The Contractor will coordinate logistics with the USAID/CAR Mission (CTO) Environmental Officer or his designated Control Officer in each country. The Regional Mission and its Country Program Offices will assist the contractor by providing key references, documents and contacts available in country as well as advise on local transportation and interpretation services. In planning regional travel, the Contractor should consider that air travel in CAR during the winter months can be adversely affected by inclement weather, causing irregular flight schedules and unforeseen delays and reroutings. An additional logistical consideration is the frequent inability of U.S. personnel to physically visit Tajikistan. Travel to Tajikistan is, at the moment, prohibited due to security issues. The contractor will likely have to rely on a "desk-study" approach, strengthened by input from in-country expertise.

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* See tentative itinerary on pages 9

Tentative Itinerary for the Biodiversity Assessment Team

Central Asia, March

Country, city	**Amount of time (days)**	**Comments**
II. Kazakhstan		
Almaty	4	
Kokshetau	3	4 flights a week from Almaty
Pavlodar (and/or other city)	3	train /flight from Kokshetau
Almaty	3	
Atyrau	3	4 flights a week from Almaty
Almaty	1	
Kyrgyzstan		
Bishkek (and/or other city plus Tajikistani assessment)	17	by road
Almaty	2	

Uzbekistan

Tashkent	7	everyday flights from Almaty
Nukus (and/or other city	4	everyday flights from Tashkent
Tashkent	6	

Turkmenistan

Ashgabat	8	2 flights a week from Tashkent
Dashhowuz (and/or other city)	5	everyday flights from Ashgabat
Ashgabat	4	
Tashkent	2	
Almaty	1	everyday flights from Tashkent
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ANNEX C

List of Contacts in Kazakhstan

Name	Occupation	Email (or fax/phone)
James L. Goggin	Director, Office of Energy and Environmental Initiatives, USAID, Almaty, Kazakhstan,	jgoggin@usaid.gov
Nina Kavetskaya	Project Management Specialist, Office of Energy and Environmental Initiatives, USAID, Kazakhstan	nkavetskaya@usaid.gov
Theodore M. Streit	Energy Policy Specialist, Oil & Gas & Electricity, USAID, Kazakhstan	tstreit@usaid.gov
Ken McNamara	USAID, Almaty, Kazakhstan, Office of Energy and Environmental Initiatives	
Sergey Yelkin	Energy Project Specialist, CEP participant, Office of Energy and Environmental Initiatives, USAID, Kazakhstan	syelkin@usaid.gov
Iskander Mirkhashimov	In-country Coordinator, Chemonics Biodiversity Assessment Team, Consultant on Institutional and Legal Issues, Wetlands Consultant, UNDP, Kazakhstan	inet@un.almaty.kz imirkhashimov@hotmail.com
Igor Glukhovtsev	In-country Coordinator, Chemonics Biodiversity Assessment Team, Consultant on Institutional and Legal Issues, CAR Biodiversity Consultant, Public Center on Biodiversity of Kazakhstan, Almaty, Kazakhstan	cbdkz@mail.ru
Myrat Musataev	Deputy Minister, Ministry of Natural Resources and Environmental Protection, Kokshetau, Kazakhstan	www.ecoline.ru/caspinfo
Serikbeck Daukeyev	Minister, Ministry of Forestry Kazakhstan	raushan@dan.kz
Ongarbai Sh. Kodanov	Chief Officer, Mangistau National Office for Flora and Fauna Control, Ministry of Natural Resources and Environment, Aktau, Kazakhstan	(3292) 440011 phone
Tokan A. Kudabaev	Deputy Director, State Inspection Department, Ministry of Natural Resources and Environment, Kokshetau, Kazakhstan	8-(316)-22-5-37-08
Beksyrga Danyshpanov	Chief, Department of Bioresources, Almaty Region, Kazakhstan	(3272) 62-41-92 (3272) 69-66-21
Marat G. Abdrakhmanov	Head, Atyrau Regional Department of Environmental Protection, Atyrau, Kazakhstan	(31222) 33035 phone
Aian Aitjanov	Head, Almaty Regional Department of Environmental Protection, Regional Ecology Expert, Almaty, Kazakhstan	633655 phone
Esen Taskinbayev	Chairman, Atyrau Regional Association of Huntergs and Fishermen, Atyrau, Kazakhstan	(3122) 37732 phone
Alexander Amanbaev	Minister of Forestry, Agrobiodiversity Specialist, Land Use, Privatization Issues, Astana, Kazakhstan	raushan@dan.kz

Talgat S. Kerteshev	Chief , Special Protected Territories and National Parks Department, Ministry of Natural Resources and Environmental Protection. Committee for Forestry, Fisheries and Wildlife, Astana, Kazakhstan	raushan@dan.kz
Koirot Ustemirov	Department Chief, Ministry of Forestry, Astana, Kazakhstan	raushan@dan.kz
Kanat B. Suleimenov	Head, North Caspian Regional Authority for Bioresources Protection, Ministry of Natural Resources and Environmental Kazakhstan, Almaty	63-36-58 63-35-62
Bulat Yessekin	Director, National Environmental Center for Sustainable Development, Chief Ecology Consultant, Kokshetau, Kazakhstan	besekin@neapsd.kz
Kuralay Karibayeva	Head, South Regional Department, National Environmental Center for Sustainable Development, Almaty, Kazakhstan	kkaribayeva@itte.kz
Zharas Takenov	Sustainable Development Policy Specialist, United Nations Development Programme, Almaty, Kazakhstan	zharas.takenov@undp.org
Saule Yessimova	Sustainable Development Policy Specialist, United Nations Development Programme, Almaty, Kazakhstan	saule.yessimova@undp.org
Sergei Yurevich Razmazin	Director, Bayanaul State National Park, Ministry of Natural Resources and Environmental Protection. Committee for Forestry, Fisheries and Wildlife	9-15-60 9-14-19
Anatoly Alekseevich Dovgal	Forest Fire Prevention Department, Almaty, Kazakhstan	(3272) 341764)
Kim Fedorovich Yelkin	Forestry Laws and Legal Issues Expert, Parliament Member, Almaty, Kazakhstan	
Alexander Bolshov	Director, CRTC biodiversity group, Kazakhstan	crtc_bd@astel.kz www.caspianenvironment.org
Ludmila Shabanova	Chair, Caspian Sea and Oil/gas Pollution Problems Committee, National Environmental Center, Sustainable Development for the Republic of Kazakhstan, Kokshetau, Kazakhstan	lshabanova@neapsd.kz www.ecoline.ru/caspinfo
Timothy Turner	Coordinator, Caspian Environmental Program, Baku, Azerbaijan	tturner@caspian.in-baku.com www.ecoline.ru/caspinfo
Vladimir Vladimirov	Scientific Liaison and Information Management Officer, Caspian Environmental Program, Baku, Azerbaijan	vladymyrov@caspian.in-baku.com www.caspianenvironment.org
Yuvenaly Petrovich Zaitzev	CEP Consultant, Chief Scientist, Odessa Institute of Marine Biology, Ukraine	ibss@paco.net
John M. Addy	Senior Adviser on Ecology, BP Environmental Officer, London,UK	addyj@bp.com
Vladimir Mamaev	CEP Conference Mediator, Biodiversity CRTC Adviser, Woods Hole Group, USA	vmamaev@whgrp.com
Katunin Damir Nikitovich	CEP Bioresources expert, Vice-Director, KASPNIIRKH, Astrakhan, Russia	kaspiy@astranet.ru
Bella Kathy Sewall	Executive Director, Law and Environment Eurasia Partnership, USA	www.ecostan.org

Ekaterina I. Rachkovskaya	Institute of Botany and Phytointroduction, Academy of Sciences, Kazakhstan	npdoos@itte.kz
Natalia Ogar	Head, Laboratory of Geobotany and Phytointroduction, NGO TERRA, Almaty, Kazakhstan	n_ogar@yahoo.com envirc@online.ru
Larisa Leonidovna Stogova	Director, ENVIRC Ecological Studies Center, NGO , Almaty, Kazakhstan	envirc@online.ru
Lidya Yakovlevna Kurochkina	Institute of Botany and Phytointroduction, Academy of Sciences, Kazakhstan	npdoos@itte.kz
Valery Melnikov	Head, Laboratory of Bioresources, Kazakh Research Institute of Fisheries, Kazakhstan	fish@itte.kz
Lyudmila Sharapova	Head, Laboratory of Hydrobionts, Kazakh Research Institute of Fisheries, Kazakhstan	fish@itte.kz (3272) 623179
Oksana Tarnetskaya	Director, Ecological Press Center NGO, Kazakhstan	otarnetskaya@itte.kz
Valery Lyssenko	Institute of Ecology and Sustainable Development (NGO), Kazakhstan	npdoos@itte.kz
Zhupar Zhunusova	Consultant on Socio-Economical Issues, UNDP/GEF, Kazakhstan	zhunusova@undp.org
Sergei Erokhov	Project Coordinator UNDP/GEF on Wetlands, Zoological Institute, Almaty, Kazakhstan	inet@undp.org common@zoo12.academ.alma-ata.su
Raushan Seitzhanova	Engineer, Environmental Dept., IAC MNREP	raushan@dan.kz
Nikolai Aladin	Chief. Zoology Lab, CEP expert, Aral Sea problems expert , Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia	aral@zin.ru
Olga B. Pereladova	Central Asia Regional Programme Manager, World Wide Fund for Nature	opereladova@wwf.ru
Raushan Kryldakova	UNDP GEF/SGP National Coordinator, Kazakhstan	Raushan.kryldakova@undp.org
Katerina Yushenko	Coordinator, GEF/SGP Coordinator on Project Monitoring and Evaluation, United Nations Development Programme, Almaty, Kazakhstan	katerina.yushenko@undp.org
Sanne Siegtenhorst	Project Officer, Milieukontakt Oost-Europa, The Netherlands	s.siegtenhorst@milieukontakt.nl
Anne Haaranen	Programme Officer, United Nations Development Programme, Almaty, Kazakhstan	anne.haaranen@undp.org
Aziz Najafov	Chief, Department of Reserves and Hunting, State Committee on Ecology, Azerbaijan, CEP country representative	econet@inteco.net
Victor E. Bulekbaev	President, Kulttorg Trade Company, Almaty, Kazakhstan	kulttorg@lorton.com
Svetlana Kolesnikova	Expert on the Aarhus Convention, National Environmental Center for Sustainable Development, Kokshetau, Kazakhstan	gsergazina@neapsd.kz
Konstantin M. Pachikin	Head, Department of soil geography, genesis and valuation, Kazakhstan Institute of Soil Sciences, National Academy of Sciences, Almaty, Kazakhstan (Council Member, Tethys NGO)	kovshar@anatoly.almaty.kz

Amankul B. Bekenov	Director, Institute of Zoology, National Academy of Sciences, Almaty, Kazakhstan (Council Member, Tethys NGO)	ADM@ZOOL@.ACADEM.ALMA-ATA.SU
Anatoly Kovshar	Head, Laboratory of Ornithology, Institute of Zoology, National Academy of Sciences, Almaty, Kazakhstan (Council Member, Tethys NGO)	kovshar@anatoly.almaty.kz
Roman Jaschenko	President, Tethys NGO, Kazakhstan, Institute of Zoology, National Academy of Sciences, Almaty, Kazakhstan	tethys@jashenko.almaty.kz
Boris Aronov	Vice president, Tethys NGO, Institute of Zoology, National Academy of Sciences, Almaty, Kazakhstan	boris@aronov.almaty.kz
Anatoly Levin	Ornithologist, Falco project manager, Institute of Zoology, National Academy of Sciences, Almaty, Kazakhstan	kovshar@anatoly.almaty.kz
Ivan Dmitrievich Mitiaev	Red Book Co-Editor, Institute of Zoology, National Academy of Sciences, Almaty, Kazakhstan	tethys@jashenko.almaty.kz
Tatyana Sidorova	Assistant Director, Korgalshin (Kurgaldjinsky) Zapovednik (Reserve),Kazakhstan	korgalshin@nursat.kz sidorca@mail.ru
Zhasulan K. Shaimardanov	Vice-President on Research and International Contacts, Pavlodar State University, Kazakhstan	zhaslan@psu.pvl.kz
Oleg N. Khamula	Director, Almaty Reserve	
Sergei Kuratov	Green Salvation Ecological Society (NGO),Almaty, Kazakhstan	ecoalmati@glas.apc.org
Wylie L .Williams	US Peace Corps Country Director, Kazakhstan	wwilliams@pcorps.alma-ata.su
Yulia Baranova	Assistant, UNDP/GEF, Kazakhstan	baranova@undp.org
Alla Bolshova	National Volunteer, UNDP, Almaty, Kazakhstan	undp_atyrau@astel.kz
Vladimir M. Litvak	Advisor, Greenhouse Gas Emissions Reduction Initiative, Environmental Policies and Institutions for Central Asia, USAID, Astana, Kazakhstan	vlitvak@nursat.kz

ANNEX D

Lists of Rare and Endangered Species of Kazakhstan

Courtesy of the Chevron IUCN Red Data Book of Kazakhstan

Fish

Species' Common Name	Latin Name	IUCN Red Data Category
Caspian lamprey	*Caspiomyzon wagneri*	2
Syr darya shovelnose	*Pseudoscaphirhynchus fedtschenkoi*	1
Aral sturgeon	*Acipenser nudiventris*	1
Volga shad	*Alosa kesslerivolgensis*	2
Caspian lake trout	*Salmo trutta caspius*	1
Aral lake trout (kumzha)	*Salmo trutta aralensis*	1
Taimen trout	*Hucho taimen*	2
Inconnu (Bukhtarma-Zaysan population)	*Stenodus leucichthys nelma*	2
Inconnu, sheetfish	*Stenodus leucichthys leucichthys*	4
Black Sea roach	*Rutilus frisii kutum*	3
Pike asp	*Aspiolucius asocinus*	1
Aral barbel	*Barbus brachycephalus brachycephalus*	2
Turkestan barbel	*Barbus capito conocephalus*	2
Ili marinka	*Schizothorax argentatus pseudaksaiensis*	1
Chu ostroluhka	*Capoetobrama kuschakewitschi orientalis*	1
Balkhash perch	*Perca schrenki*	2

Amphibians

Siberian salamander	*Ranodon sibiricus*	3
Asiatic toad	*Bufo danatensis*	4
Asiatic frog	*Rana asiatica*	2

Reptiles

Variegated toad agame	*Phrynocephalus versicolor*	3
Black toad agame	*Phrynocephalus melanurus*	3
Desert monitor	*Varanus griseus*	2
Glass-lizard, glass snake	*Ophisaurus apodus*	3
Multiocellated racerunner	*Eremias multiocellata*	4
Variegated racerunner	*Eremias vermiculata*	4
Slender racer	*Coluber spinalis*	4
Cliff racer	*Coluber rhodorhachis*	3
Caspian whip snake	*Coluber caspius*	3
Four-lined snake	*Elaphe quatuorlineata*	4

Birds

Eastern white pelican	*Pelecanus onocrotalus*	1
Dalmatian pelican	*Pelecanus crispus*	2
Squacco pond-heron	*Ardeola ralloides*	2
Little egret	*Egretta garzetta*	3
Eurasian spoonbill	*Platalea leucorodia*	2
Glossy ibis	*Plegadis falcinellus*	2
White stork	*Ciconia ciconia asiatica*	2
Red-breasted goose	*Rufibrenta ruficollis*	2
Swan goose	*Cygnopsis cygnoides*	1
Black stork	*Ciconia nigra*	3
Pink flamingo	*Phoenicopterus roseus*	1
Whooper swan	*Cygnus cygnus*	2
Bewick's swan	*Cygnus bewickii*	5
Marbled duck	*Anas angustirostris*	1
Feruginous pochard	*Aythya nyroca*	3
Velvet scoter	*Melanitta deglandi*	3
White-winged scoter	*Melanitta fusca*	3
White-headed duck	*Oxyura leucocephala*	1
Osprey	*Pandion haliaetus*	1
Short-toed snake-eagle	*Circaëtus gallicus*	2
Booted eagle	*Hieraaetus pennatus*	3
Steppe eagle	*Aquila rapax*	5
Imperial eagle	*Aquila heliaca*	3
Golden eagle	*Aquila chrysaëtus*	3
Palla's sea-eagle	*Haliaeetus leucoryphus*	1
White-tailed sea-eagle	*Haliaeetus albicilla*	2
Lammergeier	*Gyphaëtus barbatus*	3
Egyptian vulture	*Neophron percnopterus*	3
Himalayan griffon	*Gyps himalayensis*	4
Gyrfalcon	*Falco rusticolus*	3
Saker falcon	*Falco cherrug*	1
Barbary falcon	*Falco pelegrinoides*	1
Peregrine falcon	*Falco peregrinus*	1
Altai snowcock	*Tetraogallus altaicus*	2
Siberian white crane	*Grus leucogeranus*	1
Common crane	*Grus grus*	3
Demoiselle crane	*Anthropoides virgo*	5
Purple swamphen	*Porphyrio porphyrio*	2
Great bustard	*Otis tarda*	1
Little bustard	*Otis tetrax*	2
Houbara bustard	*Chlamydotis undulata*	2
Sociable lapwing	*Chettusia gregaria*	1
Ibisbill	*Ibidorhyncha struthersii*	3
Little curlew	*Numenius minutus*	3
Slender-billed curlew	*Numenius tenuirostris*	1
Asian dowitcher	*Limnodromus semipalmatus*	4
Great black-headed gull	*Larus ichthyaetus*	2

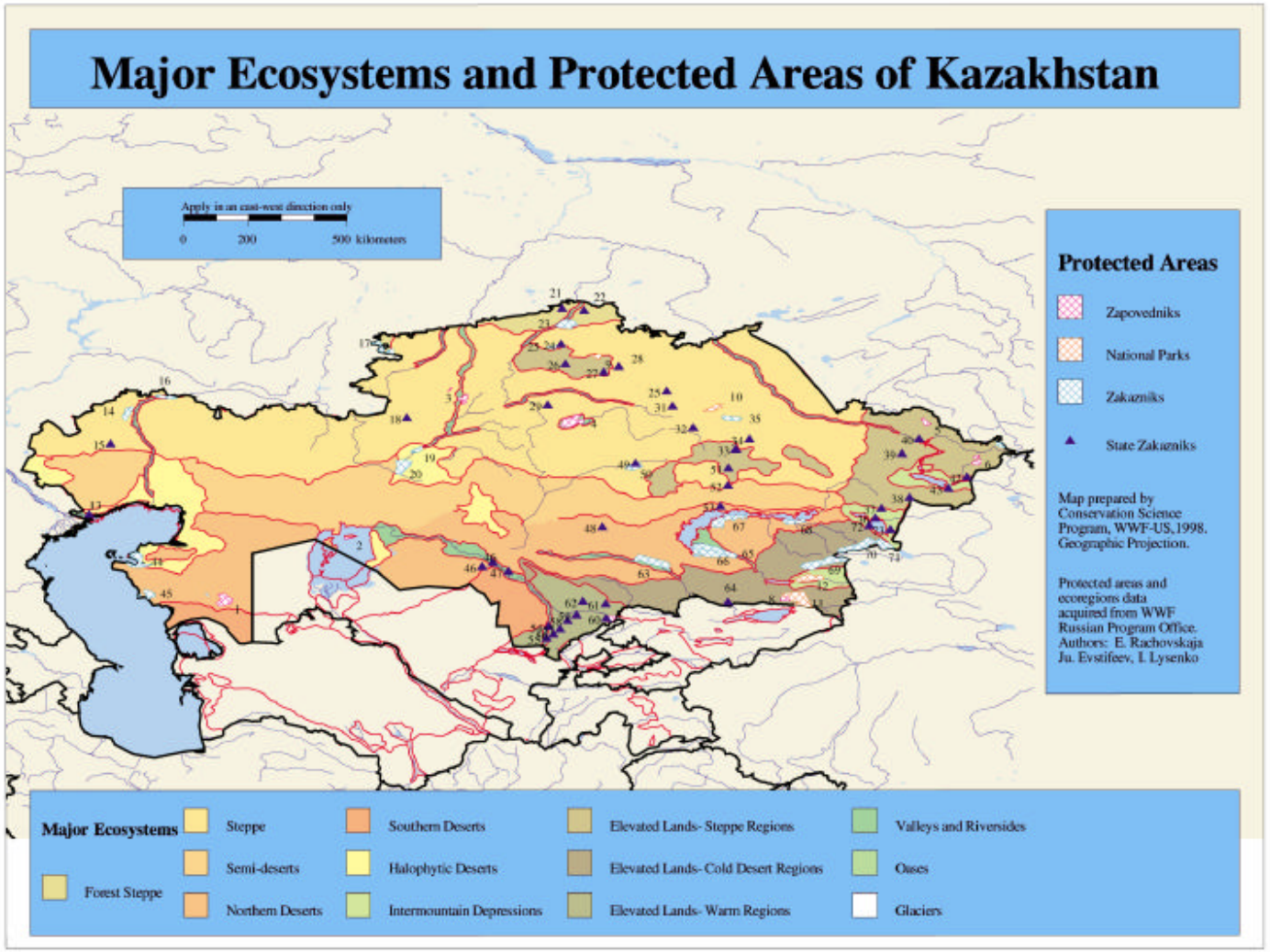
Relict gull	*Larus relictus*	1
Black-billed sandgrouse	*Pterocles orientalis*	3
Pin-tailed sandgrouse	*Pterocles alchata*	3
Palla's sandgrouse	*Syrrhaptes paradoxus*	4
Eastern stock pigeon	*Columba eversmanni*	3
Northern eagle owl	*Bubo bubo*	2
Pander's ground-jay	*Podoces panderi ilensis*	3
Blue whistling-thrush	*Myophonus coeruleus*	5
Great rosefinch	*Carpodacus rubicilla*	4

Mammals

Dwarf shrew	*Suncus etruscus*	3
Russian desman	*Desmana moschata*	2
Ikonnikov's bat	*Myotis ikonnikovi*	4
Asian barbastelle	*Barbastella leucomelas*	4
Bobrinskis's bat	*Eptesicus bobrinskii*	3
Hemprich long-eared bat	*Otonycteris hemprichi*	3
Free-tailed bat	*Tadarida teniotis*	3
Asiatic wild dog	*Cuon alpinus*	1
Tian shan red bear	*Ursus arctos isabellinus*	3
Pine marten	*Martes foina*	3
Forest marten	*Martes martes*	3
European mink	*Mustela lutreola*	1
Marbled polecat	*Vormela peregusna*	3
Honey badger	*Mellivora capensis*	1
Otter	*Lutra lutra seistanica*	2
Cheetah	*Acinonyx*	1
Sand cat	*Felis margarita*	3
Palla's cat	*Felis manul*	3
Caracal	*Lynx caracal*	1
Turkestan lynx	*Lynx lynx isabellinus*	3
Snow leopard	*Uncia uncia*	3
Central Asian wild ass	*Equus hemonius*	2
Bukhara red deer	*Cervus elaphus bactrianus*	1
Persian gazelle	*Gazella subgutturosa*	3
Transcaspian urial	*Ovis vignei arkal*	3
Altai argali	*Ovis ammon ammon*	1
Kyzyl kum argali	*Ovis ammon severtzovi*	1
Kazakhstan argali	*Ovis ammon collium*	3
Tian Shan argali	*Ovis ammon karelini*	2
Karatau argali	*Ovis ammon nigrimontana*	1
Menzbier marmot	*Marmota menzbieri*	2
Indian crested porcupine	*Hystrix indica*	4
Selevinia	*Selevinia betpakdalensis*	3
Satunin's pygmy jerboa	*Cardiocranius paradoxus*	3
Heptner's pygmy jerboa	*Salpingotus heptneri*	3
Pale pygmy jerboa	*Salpingotus pallidus*	3
Thick-tailed pygmy jerboa	*Salpingotus crassicauda*	3

Russian mole rat	*Spalax giganteus*	3
Roborovsky's desert hamster	*Phodopus roborovskii*	3
Yellow lemming	*Lagurus luteus*	3

ANNEX E


Major Ecosystems and Protected Areas of Kazakhstan
Apply in an east-west direction only
0
200
500 kilometers
Protected Areas
Zapovedniks
National Parks
Zakazniks
State Zakazniks
Map prepared by Conservation Science Program, WWF-US, 1998. Geographic Projection.
Protected areas and ecoregions data acquired from WWF Russian Program Office. Authors: E. Rachovskaja Ju. Evstifeev, I. Lysenko
Major Ecosystems
Forest Steppe
Steppe
Semi-deserts
Northern Deserts
Southern Deserts
Halophytic Deserts
Intermountain Depressions
Elevated Lands- Steppe Regions
Elevated Lands- Cold Desert Regions
Elevated Lands- Warm Regions
Valleys and Riversides
Oases
Glaciers

ANNEX F

Schedule of Team Visit

2000 BIOFOR C.A.R. Regional Biodiversity Assessment

Day, Date		Location	Schedule	Appointments	Notes
April					
TU	4	Washington DC	Early AM flight for D.C. PM arrival at Dulles International.		Booking at Wyndham City Center Hotel.
WD	5	Washington DC	AM appointment with Spike Millington, Nicole Beaumont.		
TH	6	Washington DC	AM meeting with Chemonics. PM briefing by project managers.		
FR	7	Washington DC			
SA	8	Washington DC			
SU	9	Frankfurt	Day in Frankfurt enroute to Almaty, Kazakhstan.		Flight delay.
MO	10	Almaty	Calls, mail. 4:30 PM USAID meeting.	Net connections.	
TU	11	Almaty	USAID documents. Meeting with facilitator.	Info from documents.	
WD	12	Almaty	Travel planing. Appointments, NGO.	Local contact info and phone.	Tickets & travel arrangements
TH	13	Almaty	10:00 Bekenov Amankul Bekenovich (Ministry of Sciences). 11:30 Aitjanov Aian, chief ecologist EPD (local EPA) UNDP programs, water resources issues, pollution. Kryldakova R.(national coordinator) Yushenko K. (monitoring) 11:00 Institute of zoology, Kovshar'A.F, Erokhov, Levin (crane). 15:30 Dnyshpanov, Regional Forestry Zoological Society (Red Book).	(requested info) 10 days Thesis of the conference 1999. Get e-info 5 days (e-request sent). Get e-info 5 days. Electronic proposal in print. Get report @info. Get more info.	10-12:00 PM email: 1.Chinara (Kyrgyz) 2. Firuza (Tadjik, desk) 3. Elena (Uzbek) 4. Turkmen inquiry

FR	14	Almaty	9:00 – 10:00 Turkmenistan calls. 10:00 Envirc and Terra, both NGOs working in environmental and trans-border issues. Envirc produced two books on Methodologies of Stony Lands Sustainable Development and Desert Management. 11:00 Forestry committee. 14:00 Rushan Karyldakova, small grants GEF-UNDP. Zharas Tokenov, UNDP Sustainable Development Policy Specialist (Program officer, ? Regional Environmental Representative).	Calls and electronic responses from local facilitators.	Travel arrangements for trip to Pavlodar etc.
SAT	15	Pavlodar	Full day of interviews, Almaty Regional Director Forestry, Academy of Sciences. (See appendix for people met.) Travel to Pavlodar PM.	Discussed wide range of environmental and natural resource development impacts.	Hotel check out. Flight 3113; 19:15-21:35.
SUN	16	Pavlodar, Almaata park tour.	Dr. Prof. Vice Dean of Pavlodar State University, Fungi expert. Park Director, Regional Forestry Director (cards in Russian, will photo copy). Director-Xamula Oleg Nik., Galina Vishnevskaya Dr. Prof. V. Dean Pavlodar State University), rangers, local officials. Visit to Nature Museum. (5 hrs. each way driving.)	Park hit by fungal infestation, causing large-scale forest loss.	
MO	17	Almaty	Vice Minister of Forestry. Director of the protected areas.		Flight 3114; 15:00-17:30.
TU	18	Almaty – Kokchetav	Prof. Kim Yelki, Forestry Law/Legislation. AM. Vice Minister of Environmental Affairs, Reg. Director of Forests, Hunting & Fishing. Kokchetav. Met director & staff of Caspian Ecological Program.		Flight 4477; 15:00-18:30.
WD	19	Astana	Minister of Forestry early AM. Director Protected Areas & Wetlands. Dr. L. Shabanova, Chr Caspian Sea Project, UNDP-funded. Visiting protected areas enroute.	By road to Astana.	
TH	20	Astana	Committees, NGOs & Caspian Sea project leaders. PM Bayan Aul National Park. Astana late PM.	Dir. Tengis Biosphere, Minister, Forestry.	

FR	21	Astana	Mr. Alexander Amanbaev Minister of Forestry early AM, Director Protected Areas, & Wetlands. Visiting Ministries, Forestry, Protected Areas. Talgat S. Kerteshev Chief Min. Forestry, and Ustemirov Koirot, Forestry Department Chief.	People: Ministry of Forestry, Protected Areas (see card appendix).	
SAT	22	Astana, wetlands AM, Almaty PM	Kurgaljinsky Zapovednik & Murat National Park, also called Tengis Wetlands (3 hrs. each way driving). Dir. (forestry) Dr. T. Sidorova Assistant Director (field scientist). The park is being supported by NABU, and they are funding its preparation for being declared a Biosphere site.		Traveled with Head of Protected Areas & Wetlands, Biosphere. Return flight to Almaty.
SUN	23	Almaty	Paper work.		Forms to Chemonics.
MO	24	Almaty	**Appointment USAID 9:30.** TETHYS Tethys group NGO Dr. K. Pachikin Soils Sci Dept Head, Dr. B. Arnov V. Pres., Dr. Roman Jashenko (UNDP TERRA (GIS) NGS, KSG Ibrashev. 534-050 (070) 534-082	Some of these may not be able to see us due to big meetings re: inauguration of wells.	Petroleum people not available.
TU	25	Almaty	Aliya Satubaldina. European Union (not available). Met Tethys (NGO) and Kazakh Zoological Society people (cards on list) Ministry of Science Institute Dir. Dr. Prof. Science Laureate, Amankul Bekenov.	Excellent NGO with every capability, with Acad. of Science experts. Funded projects with IUCN, WWF and German orgs. 'Nature-shcutz-Bund'	
WD	26	Almaty	World Bank? Nat. Info & Analytical Center for Statistical Info in PM.	Visited NGO, Mapping Office, Dostyk for mail.	Revisited Terra NGO.
TH	27	Almaty	Michael Bailly, principal regional man. Jmb@hb.almaty.kz, USAID oil contacts.		Will complete interviews when able, and contacts made by USAID.
FR	28	Almaty	Report.		
SAT	29	Almaty	Report.		
SUN	30	Almaty	**Day off.**		
May					
MO	1	Almaty	Report. Meeting with Chinara. Igor and Tadjik people at hotel while they are on stopover between flights from Peking. AM report writing.		Arrange to meet them at Airport with Dostyk vehicle. Igor to email flights, times. Last minute flight changes, had to pay for vehicle sent to airport for pickup.
TU	2	Almaty – Bishkek Note*** Revised Kyrgyz itinerary	By road to Bishkek, 07:00. Appointment at USAID Mission at 16:30, approx. Minister has agreed to see us after his official meetings with the President.	Met Chinara PM and went over our program in Kyrgyzstan. Have an appointment with Minister of Environ. Affairs in PM. Overnight hotel.	Confirmed hotel reservations, and program with Chinara and travel plans. Met Vice Minister. Met Nina from Almaty Mission at USAID/Bishkek.

June					
SAT	24	Tashkent – Almaty	Travel to Almaty.		
SUN	25	Almaty – Aktau	Travel to Aktau.		
MO	26	Aktau	AM meeting with Regional Hunting & Fishing Protection Department. Met director and staff. Manage Karagia Protected Area of 147,500 hectares.		
TU	27	Aktau	AM Ministry of Ecology, Minister unavailable due to President's visit next two days.		
WD	28	Aktau	Met with Marat G. Abdrakmanov, head of Regional Environmental Protection Agency.		
TH	29	Atyrau	Met head of Oblast Fisheries Protection Agency, northern Caspian area to discuss seal die off. PM flight to Atyrau.	Has no monitoring system that is linked with other Regional Caspian Project offices. Did not hear of die off until end of May. Also needed to test sedimentary plugs for DDT and other agrochemicals.	
FR	30	Atyrau			
July					
SAT	1	Atyrau			
SUN	2	Almaty			
MO	3	Almaty	Mission debriefing on Caspian Seal die off PM.		
TU	4	Almaty	**Holiday**		
WD	5	Enroute to USA	Early AM flight to Frankfurt.		
TH	6	Enroute	No bookings made by UA to Lufthansa, standby for two flights. Ended up spending day 06:30 – I9:30 in Frankfurt. Baggage was left in Almaty.		
FR	7	Washington DC	Arrived Washington without bags.		
SAT	8	Washington DC	Bags delivered in late PM.		
SUN	9	Washington DC	**Day off.**		
MO	10	Washington DC	Project expense report.		
TU	11	Washington DC	Report writing/expenses.		
WD	12	Washington DC	Financial report.		
TH	13	Washington DC	Financial report.		
FR	14	Washington/SFO	Travel.		

ANNEX G

List of NEAP Priority Projects Related to Biodiversity Conservation

Conservation of water resources

1. Rehabilitation of the Syrdarya river water protection zone; US$ 1.2 million
2. Improvement of the Balkhash-Alakol river basin water resource management (pilot project); US$7 million

Conservation related to oil and gas pollution

3. Conservation of the oil field flooded wells and exploratory wells for the purpose of the northern Caspian biodiversity conservation; US$ 3.2 million
4. Organization of environmental monitoring and the northern Caspian ecosystem pollution prevention system; US$ 6.69 million
5. Liquidation of oil pollution remaining from past activities in the Zhyloy district of the Aterau region; US$ 5.4 million

Conservation of arable lands and pastures

6. Inventory of lands and taking environmentally marginal lands and arable lands with low productivity out of agricultural rotation; US$ 1.37 million
7. Improvement of regional pasture utilization, and creation of sown pastures for the purpose of combating desertification in Kyzyl-Orda and South-Kazakhstan regions; US$ 7.35 million
8. Creation of a center for land degradation problems in the Akmola region; US$ 2.24 million
9. Development and implementation of measures for improving fertility of arable lands (pilot projects in the South-Kazakhstan and North Kazakhstan regions); US$ 17.4 million

Conservation of landscape and biological diversity

10. Increase in forest coverage for renewal and conservation of biodiversity and ecosystems; US$ 14 million
11. Enhancing the system of protecting coniferous forests from fires (Eastern Kazakhstan region); US$ 3.96 million
12. Development of the specially protected territories (SPNT) network. Creation of national inventory of unique natural areas for their inclusion into the list of World Heritage sites;
13. US$ 8.3 million
14. Organization of the priority projects management system; US $0.62 million

Supporting institutional projects

15. Creation of the priority projects management system; US$ 2.4 million

ANNEX H

Priority Action Recommendations from Republic of Kazakhstan National Strategy and Action Plan on Conservation and Sustainable Use of Biological Diversity

2.1 Completion of biodiversity inventory

2.1.1 Inventory of forest ecosystems
2.1.2 Completion of inventory and publication of the moss flora
2.1.3 Completion of inventory and publication of the algae flora
2.1.4 Key ornithological sites as a basis for conservation and sustainable use of bird biodiversity
2.1.5 Inventory of invertebrates (preparation and publication of a reference book on insects and arachnids)

2.2 Conservation of biodiversity

2.2.1 Preparation of development chart of the specially protected natural territories network and creation of reserves, national parks, and a botanical garden in the city of Astana
2.2.2 Conservation of forest ecosystems and sustainable use of their components
2.2.3 *In-situ* conservation of mountain agrobiodiversity
2.2.4 Creation of a network of protected wetlands of international significance, in accordance with Ramsar Convention
2.2.5 Conservation of biodiversity of the Caspian Sea and the Caspian region
2.2.6 Publication of the Red Data Book of Kazakhstan, Volume I, "Animals," Part 2, Invertebrata
2.2.7 Publication of the Red Data Book of Kazakhstan, Volume II, "Plants"
2.2.8 Publication of the Red Data Book, Volume III – "Vegetation Communities and Ecosystems"
2.2.9 Book of genetic fund (annotated list of species) insects and arachnids
2.2.10 Creation of a germplasm bank of endemic and disappearing plant species of Kazakhstan – conservation *Ex-situ*
2.2.11 Creation of agricultural crops and livestock germplasm bank

2.3 Sustainable use of biodiversity

2.3.1 Sustainable use of the Balkhash-Alakol basin resources for the purpose of biodiversity conservation and desertification control
2.3.2 Improvement of the system of rational use of pastures and hay harvests for the purpose of preventing the desertification process in Kzylorda, South Kazakhstan, and Almaty Regions
2.3.3 Renewal of biological diversity on degraded lands
2.3.4 Development of infrastructure for Ecotourism

2.4 Regulation of conservation and use of biodiversity

2.4.1 Environmental division by regions
2.4.2 Creation of the biological diversity monitoring system

2.5 Institutional bases of biodiversity issues

2.5.1 Improvement of the legal framework of the biological diversity conservation and use
2.5.2 Improvement of the biodiversity conservation incentive system
2.5.3 Development of the framework of the biological resources economic evaluation and standards of sustainable use
2.5.4 Information provision and dissemination of knowledge among the public on biodiversity issues

2.6 Strengthening of international relations

2.6.1 Enhancing regional interaction and international cooperation in biodiversity