



# **Biodiversity Assessment for Azerbaijan**

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

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## SECTION I

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### Introduction

This biodiversity assessment for the Republic of Azerbaijan fulfills three interlinked objectives:

- Summarizes the status of biodiversity and its conservation in Azerbaijan; analyzes threats, identifies opportunities, and makes recommendations for the improved conservation of biodiversity. This information will help USAID/Azerbaijan, and other organizations and individuals, as appropriate, make decisions related to biodiversity conservation.
- Meets the requirements stipulated under Section 119.d (2) of the Foreign Assistance Act (see Annex A, FAA Sections 117 and 119). 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 Azerbaijan.
- Analyzes the impact of current and future USAID activities in Azerbaijan on biodiversity conservation, suggests actions that USAID could support that are consistent with current and future USAID programs, and identifies special opportunities for the Mission in the area of biodiversity conservation.

The assessment was funded by USAID's Bureau of Europe and the New Independent States 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 Spike Millington and Ramaz Gokhelasvili visited Azerbaijan from October 26 to November 4, 1999.

The approach used in the assessment was to collect and analyze information on biodiversity and related areas through documentation searches, field trips, and interviews with key individuals and organizations concerned with biodiversity, both in Azerbaijan and Washington D.C. (see Annex F for a list of persons contacted). Because of the short time in Azerbaijan, the team was able to carry out only one field trip outside of Baku. This trip was focused on littoral wetlands (principally Lake Hajigabul) and the Gobustan cultural reserve.



## SECTION II

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### Status of Biodiversity

#### A. Overview

The Caucasus region has been identified by the World Wide Fund for Nature as a Global 200 Ecoregion, based on selection criteria such as species richness, levels of endemism, taxonomic uniqueness, unusual evolutionary phenomena, and global rarity of major habitat types. Moreover, Conservation International has identified the region as a global “hotspot”—that is, one of the 25 most biologically rich and *most endangered* terrestrial ecosystems in the world.<sup>1</sup> These hotspots have been identified based on three criteria: the number of species present, the number of those species found exclusively in an ecosystem and the degree of threat they face. The Caucasus region is an Endemic Bird Area, with several bird species and subspecies endemic to the region.

The Republic of Azerbaijan occupies the southeast part of the Caucasus isthmus. Within its territory lie the southeastern extension of the Greater Caucasus mountains and the eastern part of the Lesser Caucasus mountains. Between these high mountain ranges in the northeast and southwest of the country is the broad valley of the Kura River flowing out of Georgia. This is joined by the Araks River, which flows along the border with Iran to create a broad floodplain as the two rivers flow southeast into the Caspian Sea. In the extreme southeast of Azerbaijan the Talysh Mountains form an ecologically and geographically distinct zone. The Caspian Sea itself forms the eastern border of the country (see map, Annex C).

The land territory of Azerbaijan is 86,600 km<sup>2</sup> and borders with Russia (Dagestan), Georgia, Armenia and Iran, with an 11-km border with Turkey in the Nakhchivan autonomous republic. The elevation varies from 27 m along the Caspian coastline to 4,466 m at Mount Bazardyuru, Greater Caucasus.

Azerbaijan lies at a biogeographic crossroads where the flora and fauna of at least three biogeographic provinces converge, resulting in high levels of biodiversity. This region contains species typical of Europe (e.g., bear, lynx, chamois, red deer), Central Asia (e.g., wild goat, leopard), and Asia Minor (e.g., striped hyena, Persian gazelle). Many of these species are threatened elsewhere in their ranges. The varied terrain and climatic conditions contribute to a diversity of ecosystems and species. Approximately 4,200 species of vascular plants, 600 species of vertebrate animals, and 14,000 species of insects are known to be from Azerbaijan. An estimated 270 species of plants are endemic to Azerbaijan, but a much greater percentage of both plants and animals are unique to the Caucasus region. The diverse and threatened large mammal fauna includes wild goat, chamois, red and roe deer, and their predators, including wolf, lynx,

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<sup>1</sup> 1) Tropical Andes; 2) Mediterranean Basin; 3) Madagascar/Indian Ocean Islands; 4) Mesoamerica; 5) Caribbean Islands; 6) Indo-Burma; 7) Atlantic Forest of Brazil; 8) Philippines; 9) Cape Floristic Region of South Africa; 10) Mountains of South Central China; 11) Sundaland; 12) Brazilian Cerrado; 13) Southwest Australia; 14) Polynesia and Micronesia; 15) New Caledonia; 16) Choco/Darien/Western Ecuador; 17) Western Ghats & Sri Lanka; 18) California Floristic Province; 19) Succulent Karoo; 20) New Zealand; 21) Central Chile; 22) Guinean Forests of West Africa; **23) Caucasus**; 24) Eastern Arc Mountains, Coastal Forests of Kenya and Tanzania; 25) Wallacea.

wild cats, and possibly leopard. Some of these species (e.g., wild goat, deer, and wolf) undertake large-scale annual movements, increasing their susceptibility to habitat loss, degradation, and fragmentation, overhunting, and competition with domestic livestock for forage. Azerbaijan is an important migratory and wintering area for wildfowl, particularly along the Caspian shore.

The Caucasus region has been identified by the World Wide Fund for Nature as one of the Global 200 Ecoregions based on criteria such as species richness, levels of endemism, taxonomic uniqueness, unusual evolutionary phenomena, and global rarity of major habitat types. It has been identified by Conservation International as a global “hotspot” — one of the 25 most biologically rich and most endangered terrestrial ecosystems in the world. It is also an Endemic Bird Area, with several bird species and subspecies endemic to the region. Azerbaijan also possesses rich agricultural biodiversity that is gradually being replaced by more cosmopolitan varieties. The list of Azerbaijan’s plant genetic resources includes varieties and subspecies, some endemic to the Caucasus region, which are close relatives of domestic food plants. The Caucasus region also harbors several wild close relatives of domestic food plants such as wild rye, wheat, barley, millet, wild pears, cherry, and more than 200 varieties of grapes.

## **B. Main Ecoregions of Azerbaijan**

Based on geographic location, climate, soil, and vegetation cover, the following five ecological regions can be distinguished in the country (State of the Environment Report, 1997):

- The Greater Caucasus mountains (northeast Azerbaijan, about 20 percent of territory)
- The Lesser Caucasus mountains (Karabakh Mountains and Nakhchivan territory of west Azerbaijan, about 25 percent)
- The Kura-Araks valley and floodplain (central, about 35 percent)
- The Talysh-Lenkoran zone (southeast, about 10 percent)
- The Caspian zone, covering the coastal area (about 5 to 7 percent of total land area) and open waters of the Caspian Sea

### **B1. Greater and Lesser Caucasus Mountains**

These mountain chains are treated together here because of broad similarities in vegetation zones, including mountain steppes, mountain forests, and high altitude subalpine and alpine zones.

*Mountain forests (500 to 2,500 m).* Approximately 40 percent of the Greater Caucasus ecoregion is covered by forests, constituting some 48 percent of all the forest areas of Azerbaijan. Lower elevation forests (500 to 1,000 m) are dominated by Georgian oak (*Quercus iberica*) mixed with other tree species, principally hornbeam (*Carpinus orientalis*), but also Caucasian lime (*Tilia caucasica*), sweet chestnut (*Castanea sativa*), ash (*Fraxinus excelsior*), and others. A narrow band of beech-hornbeam forest grows at around 1,300 m, with forests of broad-leaved oak (*Q. macranthera*) at higher altitudes. On northern slopes, beech (*Fagus orientalis*) forests occupy extensive areas, from 600 to 1,800 m, above the Georgian oak/hornbeam forests. The maple *Acer trautvetteri* is also found in these beech forests, which are replaced at higher altitudes by birch woods, and finally by Rhododendron scrub above tree level. The high-altitude beech and birch forests are often characterized by their “crookstem” appearance. In the western part of the region

small patches of conifer forests are present, consisting primarily of *Pinus sosnovskyi* (around 1,600 m in the Belokany district).

The Lesser Caucasus ecoregion contains about 34.2 percent of Azerbaijan forests. Forests generally cover the mid-zone of mountains, occurring at altitudes between 500 m and 2,100 m in the north (up to 2,500 m in the south). These forests are predominantly broad-leaved (97 percent).

Oak forests represent about a third of forest cover and are widely distributed across the country. The frost-tolerant broad-leaved oak (*Quercus macranthera*) is found throughout the Lesser Caucasus at altitudes of up to 2,600 m. In contrast, the Georgian oak (*Quercus iberica*) is typically restricted to altitudes between 500 and 1,400 m, principally in the north and southeast. Other species of the oak forests are ash (*Fraxinus excelsior*), hornbeam (*Carpinus betulus*), Georgian maple (*Acer ibericum*), cork elm (*Ulmus suberosus*), and field maple (*Acer campestre*). Beech forests, dominated by oriental beech (*Fagus orientalis*), also represent about a third of forest cover. They are widespread in northern Azerbaijan, particularly on north-facing slopes at altitudes of 1,000 to 2,100 m. Other species of the beech forests include Caucasian lime (*Tilia caucasica*), Litinov birch (*Betula litwinow*), and spindle tree (*Euonymus europaeus*).

Hornbeam forests are less widespread than oak and beech forests and occur at altitudes of 800 to 1,800 m. Other trees found in these forests include oak, ash, field maple, Caucasian pear (*Pyrus caucasicum*), and Oriental apple (*Malus orientalis*).

*Subalpine zone (1,900 to 2,500 m).* Near the timberline, straight trunk forests reach their climatic limit and are replaced by low (“elfin”) forests of spruce, pine, fir, and beech in relatively dry and sunny areas, and by crookstem forests in moister areas, typically birch (*Betula litwinowii*), service tree (*Sorbus aucuparia*) and beech. All these forests are diverse and floristically rich, including the regionally endemic birch species (*Betula medwedewii* and *B. megrelica*), and Pontic oak (*Quercus megrelica*).

Under certain conditions, a tall herbaceous vegetation, including several species of *Aconitum*, *Cicerbita*, *Delphinium*, *Heracleum*, and *Senecio* occurs in the subalpine zone. This is unique among mountain ecosystems, including the Alps, Himalayas, and Pamir ranges. More typically the vegetation of the subalpine zone consists of grass and grass/forb meadows. Dominant species are *Calamagrostis arundinacea*, *Poa longifolia* and *Festuca varia*.

*Alpine zone (2,500 to 3,000 m).* This zone is characterized by the dominance of short-grass meadows, the “carpet-like” alpine meadows, alternating with thickets of *Rhododendron caucasicum* and rock scree vegetation. Above the alpine zone, in the sub-nival zone, environmental conditions are extreme. Still, more than 300 plant species occur here, with more than 100 being characteristic of the zone and mostly associated with rock and talus substrates.

*Mountain steppes* occur principally at altitudes above 1,500 m in the highlands; patches of forest also occur on ridge tops among steppes. Vegetation cover is varied, but important species include fescue (*Festuca sulcata*) and feather grass (*Stipa spp*). Steppes are used for agriculture (including cultivation of crops, vegetables, frost-tolerant fruit trees (at lower altitudes) and fodder plants (in highland areas). In the north, mountain steppes are characterized by dry climatic conditions, high

vegetation cover, and rich floristic composition. In the south, it is mostly distributed on the rocky and dry mountain ranges and adjacent hills. Mountain dry vegetation is hardly visible among rocks, being characterized by small and inconspicuous plants. The topsoil is almost absent so that these areas resemble mountainous deserts. Vegetation is mostly formed of grasses and dwarf bushes. This habitat is surprisingly rich in plant species and harbors some important wild relatives of domestic fruit trees, including several types of wild pear and almond trees.

*Dry scrub forests* are found in both the north and south of the country, occurring at altitudes of 900 to 1,000 m in the north, but at much higher altitudes in the south (1,800 to 2,000 m). These forests support some 80 species of xeric trees and scrubs. Juniper (*Juniperus spp.*) and broad-leaved forests occur, the latter characterized by species such as pistachio (*Pistachia mutica*), and Georgian maple and almond (*Amygdalus fenzlianum*). A variety of shrubs are supported by these forests, including buckthorn (*Rhamnus catharticus*), cherry (*Prunus spp.*), and jasmine (*Jasminium fruficans*).

## **B2. The Kura-Araks Ecoregion**

The Kura-Araks ecoregion has an arid subtropical climate and includes semi-desert and lowland steppe habitats.

*Semi-desert habitats* are dominated by wormwood (*Artemisia fragrans*), either alone or associated with saltwort (*Salsola spp*) or *Bothriochloa*. Pockets of more typical desert vegetation also occur in this area.

*Steppe vegetation* occurs in the lowlands and foothills around 300 to 700 m and is largely the result of human influence on woodland and shrub habitats. The dominant species are grasses (*Bothriochloa spp*). Rich floristic communities have developed in the *Bothriochloa ischaemum/ Glycyrrhiza glabra* steppes of the lowlands. On the foothill slopes, *Bothriochloa ephemerosa* is mixed with other grasses such as *Festuca sulcata* and *Stipa spp*. Thorny shrubs, notably Christ's Thorn (*Paliurus spina-christii*), are typical. In the western part of the region, small patches of the endemic pine (*Pinus eldarica*) are found. Currently, more than 58 percent of the territory is cultivated for agriculture (cotton, vines, grain, vegetable areas). Considerable areas are used for winter grazing pastures for domestic livestock.

Riparian forests occur along river banks and floodplain areas. Wing nut (*Pterocarya pterocarpa*) is a characteristic species, but others include the oak (*Quercus longipes*) and white poplar (*Populus alba*). These forests, known as tugay, are threatened throughout the Caucasus, with probably the most intact remaining examples being found along the Kura river in Azerbaijan.

## **B3. Talysh-Lenkoran Zone**

This zone includes the lowland area (Lenkoran) at the western coast of the Caspian and the Talysh mountains, which rise sharply from 50 to 2,436 m. The area is notable for the presence of relic forests characteristic of the Tertiary period, which occurred some 70 million years ago. Sharp variations in precipitation and climate are typical of this relatively small area, for which five climatic zones have been identified. A peculiar subtropical climate with prolonged summer droughts and heavy precipitation in other seasons has produced features more typical of South-East

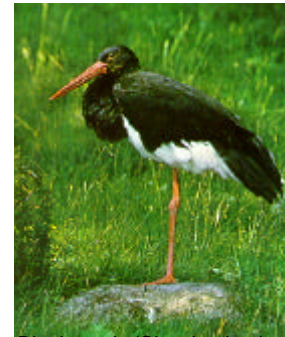


Asia than Europe. The lowland deciduous forests have a dominance of “Girkan” relic types, including *Quercus castaneifolia*, *Zelkova carpinifolia*, Caucasian persimmon, Girkan poplar, and hornbeam. Relic alder (*Alnus barbata*) and maple (*Acer velutinum*) forests occur in the river valleys and silk acacia predominates in the foothills, although stands of evergreen species, such as *Ruscus hyrcana*, box tree (*Buxus hyrcana*) and *Ilex hyrcana* are found. From 600 to 1,300 m, *Quercus castaneifolia*, *Q. hyrcanus*, and hornbeam dominate. The forests in the upper zone from 1,200 m consist mainly of *Quercus orientalis* mixed with *Sorbus caucasicus* and some *Z. carpinifolia* and *Q. castaneifolia*. Subalpine meadows occur at higher altitudes. The natural landscape has been considerably altered for agriculture, principally citrus fruits and early vegetables, as well as for livestock (cattle).

#### B4. Caspian Sea

The Caspian Sea is the largest inland body of water in the world, with a total surface area of 400,000 km<sup>2</sup>. More than 800 km of the shoreline is in Azerbaijan. 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 Caspian 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.

Desert vegetation is represented by formations of *Halocnemum spp.*, with *Halostachys spp.* (principally *H. strobilaceum*) in elevated areas. In zones of high salinity, *Salicornia* vegetation has developed. The desert habitats give way to semi-deserts with *Sueda* and *Artemisia* the dominant vegetation types.



Black stork (*Ciconia nigra*)

#### C. Species Diversity

Data on the status, abundance, and distribution of fauna and flora are very outdated. The Red Data Book of Azerbaijan, which describes plants and animals considered to be either rare, threatened, or endangered in the country, was published in 1985, but was based on data from 15 to 20 years earlier. The book does not include information on the criteria for inclusion, nor does it attempt to summarize status. Inclusion appears to be based on old scientific works, supplemented by the opinions of scientists in particular fields, and is often based on qualitative data. In some cases, data appears to be non-existent. Accordingly, the lists do not illustrate the actual status of endangered species in Azerbaijan. A better gauge of endangered species can be developed using the Red Data Book of the former Soviet Union, which also includes older data but at least considers species in the context of a much wider geographical area. The IUCN Red Data Books, in contrast, base criteria on global status and include up-to-date information, but identify only whether the species has occurred in Azerbaijan and not its status there. This may vary from that of a rare vagrant to that of a species with a substantial portion of its population found in the country.

**Table 1. Number of Animal Species Included in the Azerbaijan Red Data Book (ARDB), the Red Data Book of the Former USSR (RDB/FSU) and the IUCN Red Data Books (1996)**

Group	ARDB	RDB/FSU	IUCN	Total
Mammals	14	10	25	32
Birds	37	24	14	53
Reptiles	8	6	6	15
Amphibians	5	2	1	6
Fishes	5	n.d.	19	19
Insects	40	n.d.	11	49

*n.d.* = no data

More detailed information on the status of individual species is included in Annex D.

As befits a country straddling both Europe and Asia, Azerbaijan's fauna brings together southern species such as Persian gazelle, leopard, and striped hyaena with typically north European species such as wolf, brown bear, chamois, lynx, and wild boar. Among birds, Azerbaijan counts important populations of southern European species with restricted distributions, such as white-headed duck, ferruginous duck, and marbled teal. In migration and wintering periods, the importance of Azerbaijan's shoreline and wetlands increases, supporting high numbers of wildfowl species, including endangered species such as the three mentioned above, and lesser white-fronted goose (*Anser erythropus*), a globally declining species. Thousands of little bustards (*otis tetrax*) winter in Azerbaijan's lowlands, making this an important wintering ground for that species. The Caspian Sea supports the total world population of the Caspian seal, as well as many endemic fish species, including the economically important yet potentially endangered seven species of sturgeon.

One hundred and forty (140) species of vascular plants are listed by the Azerbaijan Red Data Book and 5 species of Azerbaijan trees are listed by IUCN.

#### D. Agrobiodiversity

Agriculture in Azerbaijan has a long history. For thousands of years, local farmers have been cultivating domestic crops such as wheat, barley, oat, rye, and grain legumes (pea, chickpea, lentil, fava beans).

Indeed, Azerbaijan has a rich flora of crop plants, both in terms of number of crop species as well as in terms of intraspecific variability. There are numerous endemic cultivated taxa. The variability within crop species is significant and well documented for some indigenous varieties (*Triticum spp.*, *Vitis vinifera*.) as well as for introduced species (*Phaseolus vulgaris*, *Glycine max*, *Zea mays*). Wild relatives of crop species are also important in Azerbaijan. A wild cultivar of beetroot (*Betta*) was recently discovered in Azerbaijan that has a higher sugar content than commercially grown varieties.

However, Azerbaijan's rich agrobiodiversity is threatened by the introduction of cultivars of a few popular species, and by the erosion of traditional



knowledge and practices for conserving agrobiodiversity.

There is also a rich diversity of fruit trees. This group of plants is composed of more than 100 species of seed and stone fruit trees, nuts, and wild berries. Notable among this group are plum, cherry, quince, and grape.

## E. Threats

Wild goat (*Capra aegargus*)

*Habitat loss and fragmentation.* Although significant areas of natural habitat remain, recent declines in available habitat threaten the persistence of some of Azerbaijan's most distinctive biodiversity. Deforestation and habitat fragmentation is a growing problem throughout the Caucasus. Easily accessible forests, such as those occurring in mountain river valleys and riparian forests, have been the hardest hit. Riparian forests, dominated by *Quercus longipes* and *Ulmus carpinifolia* with a mixture of *Celtis caucasicum*, have suffered significant destruction and degradation.

In addition, wetland habitats have suffered from drainage for agricultural and urban development, as well as oil exploration, peat extraction, and gravel mining. In addition to their unique plant and animal communities, wetlands provide critical habitat for migratory and wintering birds.

Caves that support large colonies of up to several thousand bats, including Red Data Book species, are being used as ammunition depots in the disputed area of the country, with consequent declines in bat populations.

*Unsustainable forest practices.* In the Soviet era, forests were managed principally for protection and recreation, with timber and timber products being imported from Russia. Since independence in 1991, Azerbaijan's forests have been particularly hard hit due to poor management, with widespread illegal harvesting of timber and uncontrolled fuelwood exploitation, the latter driven by the acute energy crisis during the winter months. This situation is particularly serious in the disputed region of Ngorno-Karabakh in the Lesser Caucasus due to the armed conflict, the influx of displaced persons, and the inability of forestry agents to operate in the region.

*Unsustainable livestock practices.* The rangelands (alpine meadows and lowland steppe communities) of the Eastern Caucasus have been overgrazed by sheep. Unsustainable range management, mainly by overstocking, has been intensified by the repopulation of high mountain villages, starting in the late 1980s. In subalpine meadows, overgrazing and associated disturbance is contributing to declines in wild goats (*Capra spp.*) and chamois (*Rupicapra rupicapra*). In the lowland grasslands, where the same domestic sheep move to winter pasture, severe overgrazing is significantly impacting the endemic flora and fauna of steppe communities. Such competition for grazing has contributed to the decline of Persian gazelle (*Gazella subgutturosa*) and, indirectly, the striped hyaena (*Hyaena hyaena*).

Traditionally, sheep were grazed on alpine meadows, with subalpine meadows reserved for fodder production and used during the winter months. Currently, traditional grazing grounds in the north Caucasus (Dagestan, Georgia) are no longer accessible, and livestock is kept nearer to villages all year round, resulting in overgrazing of the subalpine meadows as well as degradation of fragile subalpine woodland ecosystems.

*Illegal hunting and harvesting.* Little data exist on the impact of illegal hunting, although data indicate significant declines in the populations of large mammals, particularly ungulates (see Table 2) and predators such as wolf, lynx, and brown bear. The impact of illegal hunting on these declines is thought to be significant, although other factors such as habitat loss and competition with domestic livestock are also critical.

**Table 2. Decline in Numbers of Selected Mammal Species, 1976/1980 to 1991/1996 (from NEAP Biodiversity Working Group report)**

Species	1976-1980	1991-1996
Red deer	2500-2800	1000-1200
Roe deer	3500-3800	2800-3000
Persian Gazelle	3000-3500	2000-2800
Wild Goat	2300-2800	1200-2000
Mouflon	1600-1800*	500-700

\* data from 1981-1985

*Pollution of the Caspian Sea.* Oil exploration and production have dominated Azerbaijan's economy since the early 19th century. As onshore deposits were exploited, infrastructure for production, refinement, and transport significantly effected the littoral ecology of Azerbaijan's Caspian shoreline, particularly around Baku. Today, the legacy of decades-old inefficient production systems and crumbling infrastructure can be seen in the effects of widespread and severe oil pollution. In the post-Soviet era, western oil companies have invested primarily offshore (at least 50 km) and have adopted modern environmental control and monitoring procedures. However, oil spills from state-owned oil companies are depressingly regular since the withdrawal of Soviet support. Public awareness of this situation was raised in the late 1980s by the plight of the Sumgait terminal area, which was declared a "dead zone." Efforts to mitigate environmental pollution in Sumgait, Baku, and elsewhere have increased in recent years, but the magnitude of the problem remains severe and the costs of rehabilitation are dauntingly high. In addition to oil pollution in the Caspian Sea itself, high levels of nutrients from agricultural runoff and indiscriminate industrial and municipal discharges into those rivers (notably the Kura river) that empty into the Caspian Sea also contribute to increased pollution levels in the Sea.

The Caspian Sea Monitoring Station is responsible for monitoring the quality of water and subsoils of the Caspian Sea, as well as control and enforcement of environmental licensing. The Hydrometeorological Committee also operates monitoring stations, checking sediments for dissolved oxygen, oil, phenols, and heavy metals (notably mercury). Explicit monitoring of biodiversity has begun only recently with the arrival of western oil companies, and has focused on their own offshore stations. Baseline data do not exist. However, recent declines in the Caspian Sea sturgeon fishery have been linked to the decline in the benthic (bottom-feeding) biota of open waters. The accidental introduction of the exotic and invasive jellyfish species *Mnemiopsis leidyi* led to an explosive increase in this species, which feeds on plankton and fish larvae. In 1998, a beached bird survey south of Baku found thousands of oiled corpses of waterfowl along the shoreline.

## SECTION III

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### Status of Biodiversity Conservation

#### A. Protected Areas

According to the State of the Environment Report, the first protected area in the Caucasus was established in 1910 to protect the relic Eldar pine grove on the slopes of the Ellar-Ogli ridge in northwestern Azerbaijan. This reserve still exists today. Currently, 34 traditional protected areas exist in Azerbaijan (see map, Annex C.). These were established during the Soviet era and follow the rigid model developed and used throughout the former Soviet Union. These are divided into strict nature reserves, or state reserves (“zapovedniks”), whose objective is to preserve ecosystems and their constituent species in a natural, untouched state. All human activities, even tourism and research, are prohibited without special permission; in fact, some manipulation to increase the populations of selected species has been carried out (e.g., supplemental feeding for gamebirds and deer). There are 14 strict reserves. In addition, there are 20 state protected areas, or conservation areas, whose objective is the preservation of elements of the natural landscape, including natural ecosystems. Within these areas, certain activities are permitted provided they are compatible with the protected area’s objective. Two state hunting reserves, totaling 50,000 ha, are also included under the country’s protected area system.

Azerbaijan has also established a number of natural monuments, generally small areas considered to be of exceptional cultural, aesthetic, or scientific value. Individual trees, or stands of trees more than 100 years old are included as natural monuments. These include stands of plane trees (*Platanus orientalis*), box-tree (*Buxus hyrcana*), Pistachio (*Pistacia mutica*), *Zelkova carpinifolia*, *Celtis caucasica* and black walnut (*Juglans nigra*), containing trees up to 800 years old. Of the original 2,083 individual trees, only 1,810 remained in 1995. Similarly, of the 15,000 ha of “endemic, relict species and valuable forests” protected as natural monuments, only 7,000 remained in 1995. The principal reason stated for the decline was the inability to effectively protect these areas in zones of military conflict.

On paper, a total of 516,000 ha of lands are under some type of protection. This represents about 8 percent of the total land area of Azerbaijan. This 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 and the ecosystems and species that they are intended to protect is poorly known. Protected areas have local staff but generally lack resources, often including the means to pay staff salaries. As a result, management effectiveness of protected areas is severely reduced. A thorough inventory of the extent and status of natural ecosystems and individual species, both within and outside of protected areas, is sorely needed to develop an effective and representative protected area network for Azerbaijan. The inventory should include an assessment of the feasibility and effectiveness of current and proposed protected areas in conserving biodiversity, including the investment and reforms required to make such a system operational. This should include the consideration of a more flexible and adapted system of protected areas with a variety of management categories.

In this context, it will be useful to review the case of Georgia, where a 1996 Law on Protected areas established several categories of protected areas, following IUCN criteria, and under which a modern system of protected areas based on broad ecoregions has been proposed. The proposal in the NEAP to create two new strict reserves and two new national parks needs to be evaluated as part of this broader assessment.

### **Moving from Research to Conservation**

Azerbaijan, like many of the former Soviet states, has a long history of academic research and development. Academic excellence has traditionally been rewarded and valued. Many scientists have detailed knowledge of the country's ecology and biodiversity, and have contributed extensively to recent initiatives, such as the NEAP. Many of the members of SCE and other government agencies, as well as NGOs, have a background in academic sciences. However, there is a significant gap when it comes to applying that knowledge to practical approaches and solutions to biodiversity conservation. There is a widespread conviction that only a strictly protectionist approach will be effective in achieving biodiversity conservation goals in Azerbaijan, despite the acknowledged lack of enforcement capacity. Decision-makers and technical experts have not been exposed to alternative management approaches that:

- Promote greater participation of stakeholder and community groups in biodiversity conservation and protected area management
- Allow for broader activities in protected areas that are compatible with protected area goals and objectives
- Provide incentives for improved biodiversity conservation.

Management plans for strict reserves come down to enforcement and monitoring. There is a need to review the effectiveness of current protected areas in conserving biodiversity and to examine alternative management approaches to both existing and new protected areas where these may increase the effectiveness and sustainability of conservation. In addition, protected areas and other sites of biodiversity importance ultimately need to be considered as elements of a broader landscape approach that addresses pressures on biodiversity and gives a stake to local populations in its improved conservation. Government agencies and others have a legitimate concern that, without the required checks and balances, including environmental education and adequate monitoring capacity, risks are too great. It is therefore important that pilot initiatives are undertaken, with the support necessary to ensure that the appropriate measures and capacity are in place to assess the effectiveness of alternative approaches.

To address these concerns, study tours, exchange visits, and collaborative partnerships for decision-makers and technical managers offer opportunities to observe and learn from alternative approaches in other countries. International conservation NGOs have considerable experience in protected area management and biodiversity conservation throughout the world, and can be valuable partners in pilot initiatives. Currently none have offices in Azerbaijan, though WWF has provided limited support through its office in Georgia.

In addition to these protected areas, the Hunters Union of Azerbaijan manages 30 hunting reserves throughout the country, with a total area of approximately 450,000 ha. About 40 percent of these lands are wetlands and managed for waterfowl. Reserves are managed under contract to the State Committee on Ecology and Natural Resource Utilization (SCE), and management and revenue sharing guidelines are laid out in the individual contracts. License fees are collected by SCE, but the Hunters Union retains revenues from hunting operations, such as boat and hostel rental fees. However, revenue splits are the subject of dispute, with the Hunters Union claiming that license fees should be returned to invest in habitat management. The SCE notes that license fees are deposited in the Ecological Fund of the SCE to be distributed according to SCE priorities. Habitat management of hunting areas is non-existent.

Tables 1 and 2 list Azerbaijan's nature reserves and conservation areas.

**Table 1. Nature Reserves of Azerbaijan**

Name	Area Ha	Ecoregion	Ecosystem	Purpose of Establishment
Ag-Gel	4,400	Kura-Araks	Wetlands, semi-desert steppe	Waterfowl, fish populations
Alti-Agach	4,400	Greater Caucasus	90 percent is broad-leaved forest	Ecosystem conservation
Basit-Chay	107	Lesser Caucasus	Riparian forest	A unique grove of ancient plane trees
Gey-Gel	7,131	Lesser Caucasus	60 percent forests, 40 percent subalpine and alpine meadows, wetlands	Conservation of mountain forests and subalpine area of Lesser Caucasus, provision of the purity of water in the Gey-Gel Lake, and Eldar pine
Girkan	2,976	Lenkoran – Talysh	Humid subtropical forests	Rare, endemic and relic flora
Zakatala	25,218	Great Caucasus	Forests, alpine meadows	Protection and study of the fauna and flora of the southern slopes of the Greater Caucasus
Ilisu	9,200	Great Caucasus	93 percent is broad-leaved forest	Ecosystem conservation
Ismaili	5,778	Great Caucasus	Mountain and lowland forests	Rare and endangered species conservation
Gara-Gel	300	Lesser Caucasus	High mountain lake	Conservation of the lake
Gara-Yaz	4,900	Kura-Araks	Lowland tugay forest	Forest conservation
Kizil-Agach	88,400	Caspian	Wetlands	Bird (mainly waterfowl) conservation
Pirguli	1,521	Greater Caucasus	85 percent are forests	Ecosystem conservation
Turian-Chay	12,630	Kura-Araks and Greater Caucasus	Semi-desert and arid light forests	Ecosystem conservation
Shirvan	25,800	Caspian, Kura-Araks	Semi-desert meadows, wetlands,	Conservation of Persian gazelle, waterfowl, and plants of the Shirvan lowlands
<b>Total land area</b>	191,200	2.2 percent of the Azerbaijan		

**Table 2. Conservation Areas of Azerbaijan**

Name	Area Ha	Ecoregion	Ecosystem	Purpose of Establishment
Gara-Yaz-Akstafa	17,900	Kura-Araks	Riparian (tugay) forests	Mammals and birds preservation and restoration
Barda	7,600	Kura-Araks	Riparian forests and lowlands	Game birds
Sheki	9,100	Kura-Araks	Lowlands	Game birds, mainly pheasants
Glinani island	2,000	Caspian	Wetland	Waterfowl, other birds
Byandovan	30,000	Caspian, Kura-Araks	Semi-desert meadows, wetlands	Conservation of Persian gazelle, waterfowl, and plants of the Shirvan lowland
Gerchay	15,000	Kura-Araks	Semi-desert meadows, wetlands	Persian gazelle conservation
Lachin	20,000	Lesser Caucasus	Mountain forests and meadows	Bezoar goat ( <i>Capra aegagrus</i> ), bear, wild boar and hare conservation
Gusar	15,000	Great	Foothills and lowland	Game birds, wild boar and hare

Name	Area Ha	Ecoregion	Ecosystem	Purpose of Establishment
		Caucasus	forests	conservation
Shankhor	10,000	Kura-Araks	Wetlands	Game birds and waterfowl conservation
Ag-Gel	7,500	Kura-Araks	Wetlands	Waterfowl, little bustard, wild boar conservation
Apsheron	800	Caspian	Wetlands	Waterfowl, Caspian seal conservation
Zuvand	15,000	Talysh	Mountain meadows and forests	Game birds, bear, leopard, and rare reptiles conservation
Ismaili	40,000	Great Caucasus	Mountain and lowland forests	Rare and endangered species conservation
Gubadli	20,000	Lesser Caucasus	Mountain forests and meadows	Mammal conservation
Ordubad	40,000	Lesser Caucasus	Treeless mountain plateau	Mammal conservation
Kizil-Agach	10,700	Lenkoran	Wetlands	Waterfowl
Kiziljan	5,100	Lesser Caucasus	Mountain forests	Ecosystem conservation
Dashalti	450	Lesser Caucasus	Forests	Ecosystem conservation
Arazboyu	2,200	Kura-Araks	Riparian ( <i>tugay</i> ) forests	Forest conservation
Gabala	39,700	Great Caucasus	Forests	Forest and rare species conservation
<b>Total land area</b>	260,000			

*Ex-situ* conservation is virtually non-existent in Azerbaijan. The botanical garden of the Institute of Botany has suffered from lack of resources since independence, but *ex-situ* conservation capacity has always been low. The institute has no formal partnerships with Western botanical institutes. Further, botanical data, including the status and distribution of vegetation communities, urgently needs updating.

## B. Forests

Approximately 11 percent of Azerbaijan's territory (950,000 ha) is reportedly under forests, although the actual figure is certainly lower because of deforestation. The state forestry department (Azerles) has responsibility for about 1.2 million ha, including non-forest lands, but an estimated 266,000 ha are currently out of the control of the forestry department because of military conflict. An additional 4,000 to 5,000 ha are planted each year in open areas (mainly poplars). Commercial forestry is limited, with most management being confined to the removal of dead wood and diseased trees (estimated at about 80,000 cubic m per year). In Soviet times, 10 yearly forest inventories were carried out. The last one was in 1984. Currently, the Forest Department lacks the resources to perform inventories, although forestry "teams" exist in 34 areas of the country where significant forest resources remain. Of particular concern to the Forestry Department is the loss of riparian (*tugay*) forests along the Kura river since the damming of the river to create the Mingechevir hydropower reservoir. This has destroyed the natural flood cycle control function of downstream forests, changing the ecology of the area and affecting the water balance of surrounding agricultural lands, resulting in waterlogging and salinization. The department proposes developing pumping and irrigation systems to recreate natural ecosystems and mimic the natural flood cycle, but currently has no resources to implement this.



### C. Agricultural Lands

Agriculture and livestock form the basis of the rural economy in most of Azerbaijan. Since the collapse of the Soviet Union there has been a marked decline in the infrastructure and inputs that supported agricultural production during that era. With the decline of the cooperative farms, there has been a decline in intensive agriculture based on relatively few economically important crops, such as cotton. This has led to a return to a more diverse crop production, including market vegetables, that is less dependent on agricultural inputs, such as fertilizers and pesticides, which are now scarce and expensive. Extensive irrigation infrastructure is poorly maintained and inefficient. Soil erosion, salinization, and waterlogging are increasing problems. It is estimated that salinization affects half a million ha of irrigated land in Azerbaijan (State of Environment Report, 1997).

The trend toward more diverse agricultural and pastoral systems offers a significant opportunity for biodiversity conservation within the rural landscape. This opportunity is timely, coinciding with the ongoing land privatization process. Although land privatization currently excludes protected areas, including forest reserves, it has significant potential to impact these areas through changing the relationship and perception of rural populations to land and natural resource tenure and management, including natural ecosystems such as forests and wetlands. Incentives need to be built into the land privatization process that encourage and value improved natural resource management and biodiversity conservation. This needs to be accompanied by an awareness-raising process and technical information and assistance for improved management options. Examples could include:

#### **Integrated Wetland Management**

Integrated wetland management is an area that presents significant challenges and opportunities. Some wetlands have been drained for irrigated agriculture, others have been created for reservoirs and fishponds, but in all cases there are implications for land and water balances affecting the productivity of these systems. It is not clear how wetlands will be considered under the land privatization process, and whether there will be incentives to drain them in order to gain ownership or access rights. Wetlands in Azerbaijan are important for biodiversity conservation, supporting rare and endangered species, as well as important migratory and wintering populations of waterfowl and other species. Commercially, they can be important for fisheries and waterfowl hunting. Populations of coypu (*Myiocastor*), an introduced wetland species, are exploited for their fur. There is a need to look at wetland management in an integrated fashion to optimize the continued provision of ecological goods and services, both for wetlands themselves, and also for adjacent lands dependent on appropriate water balances. Different stakeholder groups, including direct and indirect beneficiaries, should be involved in developing and implementing management plans. Pilot initiatives can inform land and resource policy and activities and provide examples of multi-stakeholder initiatives for sustainable management.

- Community-based management of woodlands and forest stands
- Integrated wetland management
- Promotion of diversity in farming systems, such as the use of genetically diverse crop species and cultivars, medicinal plants
- Incorporation of natural habitats within a mosaic of farming systems
- Range and pastoral management systems that integrate and support improved biodiversity conservation

Many of these systems may represent traditional natural resource management systems that predated the Soviet era. Thus, the opportunity to build on them might present fewer challenges in terms of awareness raising and technical assistance.

## SECTION IV

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### Strategy and Policy Framework

#### A. Policy Framework

Increasing concern for the plight of Azerbaijan's environment led to a State of the Environment Report, developed by the State Committee on Ecology and Natural Resource Utilization (SCE) with the support of UNDP, and published in 1997. This report contains information on the ecology and ecological problems of the country, and includes a chapter entitled "National Strategy for the Preservation of Biodiversity." This chapter focuses exclusively on protected areas, providing summary ecological and historical information.

In June 1996, the Government of Azerbaijan (GoA), with support of the World Bank, began preparing a National Environmental Action Plan (NEAP) to assess and prioritize environmental issues and provide a framework for investment in the area. The NEAP was chaired by the Vice Prime Minister and coordinated by the SCE. A NEAP document was published in early 1998. The NEAP table of contents is included as Annex E. The NEAP includes a section on biological diversity, forests, and agricultural lands and attempts to link these areas in an "overall natural resources management strategy" while advocating the need to develop individual strategic plans for each area, outlining short-, medium- and long-term actions. However, priority actions detailed in the NEAP do not reflect an integrated approach. For biodiversity conservation, these are described below. In addition, the forestry actions call for replanting, primarily in riparian forests along the Kura River, to enhance soil and water conservation. No actions are proposed for land and natural resources in agricultural landscapes.

#### *1. Improve biodiversity protection*

- Develop a national strategy for biodiversity and landscape preservation (\$50,000)
- Rehabilitate and fund the Kizil-Agach Reserve (\$150,000)
- Create two new state reserves, Ordubad (upgraded from a conservation area) and Shakhbuz (\$500,000)
- Establish two new national parks, Shakhdag (which will extend from the Caspian shore up to the highest areas of the Greater Caucasus range) and Talysh (\$1 million)

#### *2. Establish a biodiversity database to protect threatened and endangered species*

- Conduct a botanical and forest resources survey (\$300,000)
- Update and republish the Red Data Book of Azerbaijan and develop a joint management plan for protecting endangered species (\$300,000)

### Sturgeon Fisheries

The Azerbaijan portion of the Caspian Sea harbors about 120 species of fish, including 7 species of sturgeon, representatives of an ancient family (Acipenstridae) dating back 200 to 300 million years. Sturgeon roe is processed as caviar and is a major source of foreign exchange for Caspian states, where 90 percent of world caviar production originates. Caviar retails at up to \$3,000/kg. In recent years, sturgeon stocks have collapsed as a result of 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 Azerbaijan, the Kyur river has lost 85 percent of its natural spawning grounds. 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. A recently started project supported by the World Bank aims to increase sturgeon populations in Azerbaijan through the development of hatcheries and improved access to spawning grounds, as well as better control of illegal harvesting and reduction in pollution levels.

The SCE is proposed as the principal responsible authority for all NEAP activities, coordinating with regional authorities for new protected area development, with the State Forestry Agency (Azerles) and the State Land Committee for the botanical and forests survey. SCE would work with environmental NGOs to update and republish the Red Data Book.

A biodiversity issue treated in some detail in the NEAP, and currently one of four priority projects being funded by the World Bank, is the sturgeon fishery (see box at left).

### **B. Legislative Framework**

Environmental legislation in Azerbaijan is based on the Constitution, adopted in 1995, which

states “that citizens of the Republic are obliged to take care of the environment and protect its wealth. The Government on behalf of present and future generations takes necessary measures for the protection and scientifically justified and rational use of land and its resources, water resources, flora and fauna, preservation of pure air and water, guaranteeing the regeneration of natural wealth and improvement in the quality of the human environment.” This is supported by the law “On Environmental Protection and the use of Natural Resources (1992)” and the “statute of the SCE (1992),” which provide for:

- The establishment and development of EIA programs
- Review and improvement of environmental standards
- Use of economic instruments for controlling pollution
- Improvement of the system of environmental awareness and education
- Promotion of cooperation in environment with regional and international organizations
- Establishment of the “polluter pays” principle
- Improvement in the system of environmental monitoring

In addition, there are agreements on cooperation in environment and natural resources with both Turkey and Georgia.

However, these laws are framework laws that require detailed implementing regulations to become effective. For example, many resolutions regarding individual protected areas have not been put into effect, with the result that many reserves are occupied by livestock and agriculturalists.

The NEAP also calls for ratification of international treaties. The principal of these is the Convention on Biological Diversity (CBD), which the GOA signed at the 1992 Rio conference, but has yet to ratify. The proposal for CBD ratification is supposedly before Parliament, but there is no indication of when it will come up for consideration. If ratified, this would provide access to Global Environmental Facility funds, which can be used to develop a national biodiversity strategy and action plan, in addition to activities related to information sharing, awareness-raising and institutional strengthening, and eventually priority projects with global biodiversity benefits that would not otherwise be financed. Other important conventions remain to be signed and ratified, including the Convention on Trade in Endangered Species (CITES); the Ramsar Convention on Wetlands; the Bonn Convention on Migratory Species; and, most recently, the Aarhus Convention on Access to Information, Public Participation Decision-Making, and Access to Justice in Environmental Matters. In the area of international conventions, Azerbaijan is far behind Georgia and Armenia.

## **C. Institutional Framework**

### **C1. Government Agencies**

The SCE is the principal government agency with responsibilities in the area of environment, including biodiversity conservation. It reports directly to the presidency, and has a central administration of about 50 professional and administrative staff and includes 26 local environmental authorities (with a total staff of 520). At the central level, there is a small Department of Protected Areas, as well as 440 staff in 35 protected areas.

While SCE is responsible for overall environmental protection, state forestry (Azerles) and fishery (Azerbalyk) agencies are also responsible for management and protection in their respective domains. Additionally, the state land commission has the mandate for “productive” land use management, particularly in the context of the ongoing land privatization process. This consists primarily of agricultural lands, and does not consider protected areas and forest reserves.

The SCE is responsible for:

- Development and implementation of environmental policy
- Development of recommendations for nature protection measures
- Implementation of Government ecological expertise for new and existing projects
- Suspension or closing down of enterprises not in compliance with environmental legislation
- Inspection of operating enterprises
- Issuance of permits for permitted pollution

There is recognition that the current institutional and policy configuration has led to confusion, overlap, and duplication of environmental functions and activities. Mandates, in addition to being unclear, often appear contradictory. The NEAP proposes the separation of management functions from control and regulation functions for agencies such as Forestry and Fisheries, with the control

and regulation function passing to SCE, thus eliminating conflict of interest in Azerles and Azerbalyk.

The World Bank-supported Urgent Environmental Investment Project (UEIP) focuses on four priority actions recommended in the NEAP. One of these is to strengthen the institutional capacity of the Government of Azerbaijan environmental agencies. The project will review the mandates and responsibilities of different agencies as well as the legislative and regulatory base for their activities, and make recommendations to rationalize these. The creation of a new Ministry of Environment or Environmental Agency is mentioned in the Terms of Reference. At the same time, the project proposes to rationalize the structure and functions of the SCE at the central, regional, and local level, as well as develop the capacity of the SCE through the adoption of improved management and information systems that will aid priority setting and resource allocation. This will also enable the SCE to focus on those areas of high ecological importance and that face significant threats.

The the Government of Azerbaijan is currently preparing a major public sector reform program to streamline the structure of government by reducing the number of government agencies. The World Bank will support this process through a structural adjustment loan. Environment is seen as an opportunity to provide a model for the public sector reform process, as well as commitment to the process at the highest levels of the government.

## **C2. Academic Institutions**

The Azerbaijan Academy of Sciences includes the Institutes of Zoology and Botany. Resources for these institutes have become very scarce in the post-Soviet era and there are few incentives for young scientists to continue in academic research. There is a clearly a role for these organizations to play in supporting research and information gathering on Azerbaijan's biodiversity, for which most information is out of date. Individual scientists have been involved in inventory and monitoring work with the support of international organizations, and work with government agencies on an ad-hoc basis when information is needed (e.g., NEAP preparation), but there is no systematic support of the type that could be fostered through partnerships with academic or conservation organizations in other countries.

## **C3. NGOs**

The informal and NGO sector concerned with environmental issues has flourished in the last couple of years, but remains embryonic. Environmental NGOs are often created by concerned academics, who see the need for an independent voice in environmental issues but also view NGOs as an outlet for their scientific expertise. However, organizational and management capacity remains low: despite the fact that a clear role and opportunities exist for NGOs, many lack a clear vision and idea of where and how they can most effectively contribute to improved environmental management in Azerbaijan. Tensions exist with some government agencies, which view some NGO activities as more appropriate for government. This tension is heightened by perceived competition for scarce financial resources provided by international organizations. On the other hand, NGOs are often frustrated by the slow pace and cumbersome bureaucracies of government agencies. New NGO legislation is currently being developed. It is to be hoped that this will streamline and facilitate NGO registration procedures.

#### **C4. Regional Environmental Center**

The Caucasus Regional Environmental Center (REC) is a foundation that aims to promote cooperation among stakeholders at national and regional levels and address environmental problems in Azerbaijan, Armenia, and Georgia. Under its charter (1999), activities shall be to:

- Assist in the exchange and dissemination of information on issues of environment and sustainable development; provide access to national and international databases making use of existing structures and facilities; produce newsletters and other publications
- Provide support for environmental education, training, and capacity building
- Provide support wherever possible for initiatives aimed at increasing environmental awareness
- Establish a grants program that maintains a balance between small and large grants, and participate with other RECs in developing a grants scheme for regional and transboundary projects
- Promote public participation in the decision-making processes of society that relates to the environment
- Provide a forum for discussion of environmental issues; policy analysis relating to environmental issues, sustainable development and interaction between governments, NGOs and other stakeholders
- Provide a framework for possible regional cooperation at a governmental and non-governmental level
- Provide a link with the business community and industry on environmental issues

At the time of writing, the Government of Azerbaijan had yet to sign the REC charter, although the representative NGO from Azerbaijan has signed. Several NGOs in Armenia and Georgia indicated concerns regarding the process of the establishment of the structure and charter of the REC, citing lack of transparency and consensus, as well as an overly prominent role for government representatives. Funding for the REC comes primarily from EU-TACIS, although the U.S. government has provided financial support through USEPA.

#### **C5. Industry**

The Azerbaijan International Operating Company (AIOC), a consortium of international and domestic oil companies for which BP/Amoco is the single operator, has an environmental subcommittee with research and monitoring groups related to the environmental impact of its activities in oil production and transport. These groups consist of scientists, research institutes,

government agencies, and oil companies. Over the last four years, monitoring has been carried out on sea currents, fish populations, mortality of Caspian seals, bird populations along the Caspian shore, and the northern and western oil pipeline routes. In addition, BP/Amoco has supported oiled bird surveys in Azerbaijan under its Global Conservation Grants Program, as well as environmental education materials, including a children's book on Caspian Sea wildlife.

## **C6. Internationally Supported Biodiversity Conservation Projects**

The *State of the Environment Report* (supported by UNDP) and the *NEAP* (supported by the World Bank) were the first attempts to look at environmental issues, including biodiversity conservation, since Azerbaijan's independence. The *Urgent Environmental Investment Program* (UEIP – see subsection C1, above) focuses on four areas of the NEAP, but not specifically on biodiversity conservation. In the neighboring countries of Armenia and Azerbaijan, the World Bank and GEF are much further along in supporting biodiversity conservation programs.

The recently (1999) initiated *Caspian Environmental Program (CEP)*, funded by GEF and implemented by the World Bank/IFC, brings together the five littoral Caspian countries to identify transboundary environmental priorities and investment needs, notably in the areas of industrial pollution prevention and mitigation, and the recovery of sturgeon stocks and their habitats. However, potential projects addressing other priority environmental issues with transboundary impacts, such as biodiversity conservation, are also eligible for support under this program. Biodiversity is one of 10 technical program areas of the CEP. This program is centered in Kazakhstan, but there is a national focal point in Azerbaijan that is responsible for producing a biodiversity report by the end of 1999.

Thus, despite the importance of Azerbaijan's biodiversity, international donor support for biodiversity conservation remains low; in this respect, Azerbaijan appears to be the "poor relation" among Caucasus countries.

The EU-Tacis-supported *Regional Environmental Awareness Raising Program* (1996-1999) has targeted parliamentary groups, media journalists, and NGOs in Azerbaijan, Armenia, and Georgia. In 1998, a small project fund brought together NGOs from the three countries to take joint action to address the issue of pollution of the Kura-Araks river. The program has been broadly successful, but will end in December 1999 as EU-Tacis has not identified environment as part of its upcoming strategic program.



## SECTION V

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### Summary of Findings

1. The institutional and legislative framework for biodiversity conservation was inherited from the Soviet era, and follows a rigid and prescriptive Soviet-type model that relies largely on centralized, State-dominated, command-and-control mechanisms. These depend heavily on increased enforcement capacity of government agencies, which, given current budgetary priorities and constraints, is probably not realistic. Consideration should be given to moving toward more sustainable management arrangements using incentive-based systems that involve public participation.
2. Government systems remain highly centralized in terms of authorities. Yet, significant numbers of regional and local staff exist on the ground, e.g., protected area authorities. However, these people have meager resources, lacking even basic equipment and receiving irregular and low salaries. Improved support to decentralized authorities, including new partnerships with local groups and communities, needs to be developed.
3. Environmental awareness and understanding remains extremely low, and a narrow view is held of biodiversity conservation, which is seen as the domain of academic scientists. There has been some improvement in recent years, primarily due to the efforts of environmental NGOs. However, this is in its early stages 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.
4. During the Soviet period, unplanned and poorly managed development coincided with almost complete disregard for environmental impacts and consequences. The time since Azerbaijan's independence has seen a marked decrease in agricultural and other inputs, and intensive farming practices. This provides an opportunity for more sustainable development that integrates environmental concerns, including biodiversity conservation. Well-planned agriculture, forestry, and water management programs have significant potential to favor improved biodiversity conservation.
5. The "academic" information base on biodiversity is outdated, and data on distribution and abundance needs updating for most groups. Habitat and ecological community data urgently need updating. Related to this is the need to move from an academic approach to biodiversity conservation to a more development-oriented approach in which this information is used as a planning and development tool.
6. An effective and representative protected area system that includes different management categories is critical to conserving biodiversity. Currently, the system needs a complete overhaul. At the same time, pressures on protected areas need to be better understood, and management plans need to be developed that address those pressures.

7. Environmental NGOs in Azerbaijan are still mostly dominated by academics. While they have a useful and important role to play, the development of NGOs representing a broader spectrum of civil society needs to be encouraged. NGOs in Azerbaijan do not yet have the potential to be powerful agents of change in the way that NGOs in neighboring Armenia and Georgia have. In terms of biodiversity conservation, support is needed to increase awareness and education, advocacy and lobbying, information gathering and sharing, and developing on-ground initiatives supporting community-based organizations (CBOs), local communities, and others. Different NGOs will have varying capacities and interests in these areas.
8. Much of the discussion and activity related to biodiversity conservation has focused on broad frameworks for action, been largely government driven (with input and support from NGOs and donors), and 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 can demonstrate success and inform the ongoing policy discussion.
9. Azerbaijan can profit by being exposed to the approaches and activities relating to biodiversity conservation being carried out in Armenia and Georgia. These countries, in addition to their similar ecology and biodiversity (including similar threats and pressures), share a similar institutional and policy background as part of the former Soviet Union. Although relationships remain difficult with Armenia, cooperation exists with Georgia in information sharing and in regional cooperation. A recent biodiversity transboundary initiative with Georgia has just begun in the semi-arid zone with GEF support. Because biodiversity conservation is a transboundary issue and because it is politically less sensitive than other sectors, efforts need to be encouraged to achieve greater regional cooperation with Azerbaijan.
10. The private sector has had a limited role in biodiversity conservation in Azerbaijan. The current policy and legislative framework does not encourage private sector participation in this area, nor is it clear whether incentives are in place that would favor the necessary investment in infrastructure. In the future, opportunities for private sector involvement in biodiversity conservation could include ecotourism development, sustainable forest management initiatives, hunting reserves, and protected area management.

## SECTION VI

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### Recommendations for Biodiversity Conservation

#### *1. Develop a National Biodiversity Strategy and Action Plan (BSAP)*

This is a primary recommendation of the NEAP and is a critical first step in understanding and prioritizing biodiversity issues in Azerbaijan. The Government of Azerbaijan should ratify the Convention on Biodiversity, which could then allow access to GEF support for developing a national biodiversity strategy. Regardless of GEF financing, the effort should begin with a conservation priority-setting process that identifies habitats and species of critical biodiversity importance and assesses the status and threats to their conservation. A workshop bringing together stakeholders, including NGOs and regional representatives, to discuss priorities and actions will increase transparency and information sharing. It is important that the workshop not be dominated by academic scientists, but brings in related disciplines such as forestry, fisheries, and agriculture, as well perspectives from political, social, and cultural fields, and feedback reflecting realities from the field. Selected background papers and information can be prepared, but it is important that workshop goals, objectives, and methodologies are clear and agreed upon, and that the process is well facilitated and results in clear, implementable, and prioritized recommendations. The presence of participants from outside of Azerbaijan who can share best practices and lessons learned from a regional or international perspective can be valuable. A critical output of such a workshop is the identification of information gaps and needs for effective conservation interventions.

The following recommendations may result from a BSAP process, but are outlined here based on information gathered and meetings held during the present study.

#### *2. Review, analyze, propose and develop a revised protected area system, including forest reserves, for representation, effectiveness and management regimes*

The current protected area network should be reviewed to:

- Assess the status of individual protected areas, because some have been severely degraded, and boundaries may need to be revised to reflect the distribution of the original natural ecosystem
- Assess the appropriateness and effectiveness of current management categories in protecting the reserves and propose alternative management categories that may increase effectiveness, e.g., through the provision of incentives for community involvement
- Review the extent to which the variety of ecosystems and species is represented in the current protected area system and propose changes to the network to ensure improved representativeness

- Review the protected areas network within a broader landscape framework that links areas under different land use and management regimes, such as forest lands, and identifies pressures and threats, to develop a more holistic and integrated approach to biodiversity conservation

3. *Identify status and develop management guidelines for fragile or vulnerable habitats, and incorporate into environmental guidelines*

Azerbaijan, like many other former Soviet Union countries, has been slow to reorient its approach from one based on individual species conservation to one that focuses on protecting habitats. Updating the Red Data Book, which details the status and threats of endangered species, is important to identify those species critically at risk. This should be accompanied by a process that identifies and documents habitats on which those species depend. Identification and distribution of fragile and vulnerable habitats, such as alpine meadows and wetlands, should be the first step in developing management guidelines for the conservation and sustainable use of such areas. This should then be incorporated into environmental guidelines and legislation concerning different types of planned investment projects potentially affecting these habitats.

4. *Develop pilot initiatives in community-based natural resource management and biodiversity conservation, e.g., for forestry, grazing, wetlands, tourism*

Although the development of environmental programs and action plans provides an important framework for investment in the sector, few local biodiversity conservation initiatives exist that can inform the policy and planning process. Examples of innovative approaches need to be developed that promote the sustainability of natural resource management and biodiversity conservation. Given the harshness of the current economic situation, incentives for local communities and other stakeholder groups are needed to better manage their resources. Management plans that detail the rights, responsibilities, and benefits to local groups should be developed for improved management. In the absence of such incentives, natural resources will continue to be depleted in an unsustainable fashion. Community-based management of forests, grazing lands, and wetlands should be encouraged on a pilot basis and carefully monitored for sustainability. Opportunities for community involvement in protected area management, e.g., through ecotourism development and biodiversity monitoring, should be encouraged.

5. *Develop and build on mechanisms to bring together government, donors, academic and NGO groups for awareness raising, information sharing and coordination of activities*

There is confusion regarding the most appropriate and effective roles for government agencies (at both national and local level), academic institutions and NGOs. In order for biodiversity conservation to be effective, the relative advantages and different roles of these groups, and how they interact with communities and the public at large need to be understood, internalized and developed. While there is a good basis for coordination and communication, this needs to be improved, and capacity building efforts need to be appropriately targeted. Resources will always be scarce and it is important that they are used optimally.

6. *Support NGOs in awareness raising and local initiatives*

The newly formed NGO movement has an important role to play with respect to advocacy, awareness raising, and education about environmental issues targeted at decision-makers, politicians, the general public, and schoolchildren. NGOs are already active and effective in these areas. Efforts to develop organizational capacity need to continue, and be paired with building technical and implementation capabilities. There is little coordination of activities among NGOs, and there is an opportunity to bring concerned NGOs together to discuss approaches and coordinate activities. This process could be facilitated by a group such as ISAR, which could also support interregional cooperation with neighboring countries and international NGOs. An international environmental education specialist should facilitate the process, and share best practices and lessons learned from elsewhere, as well as indicating areas of collaboration with international NGOs.

### **Integrating Environment and Economics**

Despite the country's dependence on natural resources — from oil from the Caspian Sea to agriculture from the land — the Government of Azerbaijan has tended to view the environment in a compartmentalized way. Only recently has the environmental impact of economic activities, notably oil production, become an issue, and mitigation measures considered. Still, compared to the foreign exchange and employment generated by the industry, environmental issues are seen as low priority.

The state-owned oil industry is very inefficient in terms of production capacity and is responsible for many oil spills. The modern oil industry is much more efficient and less environmentally damaging. In fact, the link between economics and environment is a close one. Awareness raising in the area of environmental economics and the integration of environment into economic and sectoral policies and plans can be very effective in promoting environmental issues among politicians and decision makers.

Similarly, the de facto increase in low-input agriculture due to the absence of subsidized fertilizer and pesticides in the post-Soviet era offers an opportunity to promote "organic" agricultural products in a potentially expanding market, while at the same time reducing the negative environmental and health effects of high input use. Education on the benefits, both environmental and economic, of sustainable agriculture, can be important in raising awareness of its potential as an alternative to high input, undiversified production systems. Conservation of the country's important agrobiodiversity should be an integral component of sustainable agriculture programs. High-level commitment will be important to influencing policies and programs, which will then be implemented by operating agencies, e.g., through agricultural extension agents.

In addition to awareness raising, NGOs can potentially play a valuable role in working with local communities to support and develop field-based conservation initiatives (see No. 4, above). It is not clear whether such capacity currently exists, but training, skills transfer, small grants and partnerships with regional and international NGOs can significantly increase the ability of NGOs to be effective local development partners.

*7. Promote regional collaboration through information sharing, exchange visits, study tours, conferences, and transboundary initiatives*

Broadly speaking, Azerbaijan's progress in biodiversity conservation lags behind that of Armenia, and particularly Georgia. Lessons and experiences shared between these three countries that together represent many of the biological resources unique to the Transcaucasus region have the potential to significantly improve capacity in the region, as well as promote broader cooperation. Azerbaijan can benefit from the experience of Georgian organizations, particularly NGOs, in information sharing, community-based initiatives, and policy development, but also with the government with respect to modernizing the protected area system and forest management policy. Georgia is the only one of the three countries with representation of international conservation NGOs (World Wildlife Fund) and with experience of implementing a major biodiversity project (Protected Areas Development). The proposed Regional Environmental Center in Tbilisi has the potential to be an important institution in this respect.

## SECTION VII

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### USAID in Azerbaijan

#### A. Impact

USAID's program in Azerbaijan has focused primarily on humanitarian assistance to populations internally displaced by the conflict in Ngorno-Karabakh. This support has been mainly through international relief organizations. The Mission's new three-year strategy seeks to shift the orientation of assistance efforts to longer-term economic development goals, focusing on the potential to support private sector initiatives in agricultural development through agribusiness, agroprocessing, and related areas. Assistance to the Government of Azerbaijan is currently prohibited under Section 907 of the Freedom Support Act, a situation that could change in the event of significant progress toward resolving the Ngorno-Karabakh situation.

The difficulty of controlling natural resource management in disputed areas, and deforestation by refugees and internally displaced persons (IDPs) to meet fuelwood and other subsistence needs were cited by various government agencies and others as significant issues. USAID's program to improve living conditions for refugees and IDPs should have a positive effect in reducing unsustainable, short-term natural resource exploitation. However, resettlement programs need to be carefully monitored to minimize the impact of short-term and potentially long-term effects on ecosystems that are fragile and may have long recovery times. This should be built in to cooperative agreements with grantees and other organizations supported by USAID.

USAID's support to the developing NGO sector through ISAR has a positive effect on encouraging and building confidence of environmental NGOs, as well as building their capacity and promoting partnerships.

#### B. Recommendations

Recommendations for USAID fall into three main groups:

- Promoting biodiversity conservation in the current and planned program
- Options for the planned program in the event of Section 907 repeal
- Options in the event of a shift toward environmental activities in the Mission program, including regional programs

Promoting biodiversity conservation in the current and planned program:

- Monitor environmental impact of humanitarian support programs. In addition to assessing and monitoring environmental effects of humanitarian support programs, this would review ongoing and planned mitigation activities, and strengthen and refine them

in the light of current environmental mitigation guidelines and techniques. Areas of high biodiversity importance should be targeted for monitoring and mitigation efforts.

- Further develop the capacity of environmental NGOs in Azerbaijan, through the activities of ISAR, and developing collaborative partnerships with regional and international NGOs, particularly in the area of environmental awareness raising and education, but also through small grants initiatives.
- Explore opportunities for NGOs to support or promote community-based conservation initiatives. Examples could include wetland management of former fish farms, or hunting reserves, maintenance and restoration of small watersheds for improved water quality and supply as well as soil conservation (tugay forests are an example), sustainable management of natural woodlands, and improved grazing practices (such as around the Gobustan reserve, where population levels are still relatively low).
- Explore options for promoting and valorizing diversified, low-input agriculture that can support conservation of agrobiodiversity, as well as biodiversity within broad landscapes.

Options for the planned program in the event of Section 907 repeal include:

- Study tours for high-level politicians and decision-makers to the United States to build understanding and commitment to environment and biodiversity. For example, in Georgia, an interagency agreement with the U.S. National Park Service is promoting exchange and training between U.S. and Georgian agencies and parks, resulting in increased awareness and commitment to protected areas and biodiversity conservation.
- Study tours, training, and exchange visits to the United States and to other countries in the region (e.g., Georgia) for technical managers and decision-makers. These could include: study tours to national parks and other categories of protected areas emphasizing multiple-use programs, managed wetlands and hunting areas, exchange programs with universities and government departments active in biodiversity conservation; as well as training in protected area management, community-based natural resource management programs monitoring, evaluation of ecosystems and biodiversity, and alternative financing mechanisms.
- Policy dialogue with the Government of Azerbaijan to encourage the ratification of the Convention on Biodiversity and support a participatory BSAP process through leveraging of GEF resources. Policy dialogue could also focus on the development of new policies and legislation that is better adapted to the realities of biodiversity conservation in Azerbaijan, including the integration, and the effectiveness of implementation, of current and future policies.
- Dialogue and programs that facilitate the creation and operation of NGOs in Azerbaijan. This could include the legal and regulatory environment for NGOs, as well as the promotion and support of NGO-government partnerships. The environmental



area could be a promising sector in which to begin these kinds of discussions and activities. The Caucasus Environmental NGO Network, which promotes information exchange and sharing, as well as regional workshops and activities, is one example.

Options in the event of a shift toward environmental activities in the Mission program, including regional programs, include:

- Promote regional cooperation through information sharing, exchange visits, conferences, joint studies, partnerships, and possibly transboundary projects (e.g., within the context of Kura basin initiative). Environment is an area that presents opportunities for cooperation between Azerbaijan and the neighboring states of Armenia, Georgia, and Turkey due to their many shared resources. A recent environmental concept paper for USAID/Armenia has proposed a regional Caucasus water initiative, to include Georgia and Azerbaijan. Watershed protection, including sustainable forest management, wetland protection, and biodiversity conservation is an important element of improved water supply and quality and could easily fit into such an initiative.
- Other areas of regional cooperation could include regional prioritization of biodiversity, including critical habitats and regionally threatened areas and species. This would reflect the importance of the Caucasus as a biodiversity center and would rationalize conservation in individual countries based on global importance. In addition, it would promote the conservation of migratory species in the region. One area of particular importance relates to wetlands throughout the Caucasus, which are extremely important for biodiversity conservation and in a very threatened state. USAID could usefully support an analysis of wetland distribution, management and importance in the region, with a goal of identifying key areas of focus for future activities (either through USAID or other donors).
- The Mission should follow progress in development of the REC, since potentially this could be a valuable structure for regional cooperation. For example, it could provide an opportunity to continue the open Parliamentary meetings and public hearings originally developed under the TACIS regional awareness raising program, as well as continuing the NGO and media activities of that program. Since both ISAR-Baku and the NGO Center in Yerevan are supported by USAID, there is a clear opportunity to integrate these activities into future USAID programming for NGO support.



**ANNEX A**

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Sections 117 and 119 of the Foreign Assistance Act

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## **ANNEX B**

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### Scope of Work

#### **Country Biodiversity Assessments**

##### **Azerbaijan, Armenia, and Georgia**

#### **I. Objective**

To conduct a country-wide assessment of biodiversity resources and their status for the purposes of complying with 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 habitats 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).”

In order for USAID Missions to be in compliance with the above, and in order to 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 USAID/ENI Missions in Azerbaijan, Armenia and Georgia with this critical information.

##### **B. Overview on USAID Programs in the Caucasus**

Congress has created a \$250 million “Southern Caucasus” earmak for FY 1988- up from \$143 million in FY 1997. **Armenia** is a strategically important republic in the Caucasus which is in the

early stages of a transition to achieve a democratic market-oriented economy. It was the first former Soviet Republic to register real economic growth in 1994. Between 1992-1996, USAID primarily focused its resources on humanitarian assistance which will still be required, but at diminishing levels. Greater emphasis will now be directed to the restructuring of the energy and financial sectors; creating a legal, regulatory and policy framework for broad-based competition and economic growth; and promoting a democratic transition through better-informed citizen participation in political and economic decision-making. USAID and other USG support to **Azerbaijan** is severely restricted at this time due to political issues related to offensive use of force against Armenia and Nagorno-Karabakh. USAID provides humanitarian assistance which is channeled through international organizations and limited training to private citizens, including to farmers and agribusiness entrepreneurs in areas such as agricultural marketing. Since 1992, USAID's program in **Georgia**, has been primarily in the form of emergency humanitarian assistance. USAID has been the largest bilateral donor, providing more than half of the country's emergency needs. USAID is gradually shifting its emphasis toward economic and social sector restructuring and democratization to meet the changing nature of the development challenge there. USAID is establishing two finance programs intended to support private sector development and growth. USAID also has a program to support the restructuring and organization of corporate enterprises in the electric power and oil and gas subsectors, including legislative and regulatory reform, and aims to mobilize private/public financing for selected energy projects to rehabilitate energy infrastructure.

### III. Statement of Work

The Contractor shall perform the following activities:

- A) Hold meetings with the Bureau Environmental Officer (BEO) of USAID's ENI Bureau in Washington, to ensure full understanding of ENI's program in the Caucasus, USAID Environmental Procedures and purpose of this assignment. This would include 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.
- B) Field a team to conduct an overview and general analysis of each country's biodiversity and its current status. The documentation should include descriptions 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 forests 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 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.
- Conservation efforts including national policies and strategies, the status of financing for conservation, the status of country participation in major international treaties, 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 organizations which support biodiversity conservation, an identification of NGO's, 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 2) any potential opportunities for USAID to support biodiversity conservation consistent with Mission program objectives.

C) For each country specified, 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 for this assignment. One team member should be a biodiversity specialist with international, regional or in country experience. The second team member should be a natural resources institutional/policy specialist with international or in-country experience. The team leader may have either of these specialties; however, the team leader should be a senior-level professional with USAID experience with significant experience in international conservation programs and environmental impact assessments. Experience in the region or country is preferred. The second team member should be a mid-level or qualified junior level professional. USAID/ENI encourages the use of local professionals for the second team member as appropriate for this assignment.

#### **V. Deliverables**

The primary deliverable under this task order is a report for each of the three countries, addressing the points specified in the statement of work, not to exceed 30 pages, excluding annexes. Each report will contain at a minimum one map which provides a broad picture of key ecosystems, habitats and protected 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 set of deliverables are in-country Mission exit briefings.

Two hard copies and one electronic copy in Word format of this assessment shall be provided to the USAID Mission in each country as well as to the ENI Bureau Environmental Officer.

## **VI. Reporting Requirements**

The Contractor shall report to the Bureau Environmental Officer in Washington for this overall assignment. While in each country, the contractor shall report to the Mission Environmental Officer or his/her designee.



## **ANNEX C**

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### Map of Protected Areas in Azerbaijan (From NEAP)

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## ANNEX D

### Lists of Rare and Endangered Species of Azerbaijan

**Table 1. List of Rare and Threatened Mammals of Azerbaijan**

Common Name	Species	ARDB	IUCN
Mediterranean Horseshoe Bat	<i>Rhinolophus euriata</i>	+	VU
Greater Horseshoe Bat	<i>Rhinolophus ferrumequinum</i>		Lr/cd
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>		VU
Mehely's Horseshoe Bat	<i>Rhinolophus mehelyi</i>		VU
Barbastelle bat	<i>Barbastella barbastellus</i>		VU
Bechstein's bat	<i>Myotis bechsteini</i>		VU
Geoffroy's Bat	<i>Myotis emarginatus</i>		VU
Lesser Noctule Bat	<i>Nyctalus leiseri</i>		Lr/nt
European Free-Tailed bat	<i>Tadarida teniotis</i>	+, U	
Schreiber's Long-Fingered Bat	<i>Miniopterus schreibersi</i>	+, U	Lr/nt
Caspian Tiger	<i>Panthera tigris virgata</i>	+, U	
Striped Hyaena	<i>Hyaena hyaena</i>	+, U	
Eurasian Lynx	<i>Felis lynx orientalis</i>	+	
Leopard	<i>Felis pardus tullianus</i>	+, U	
Wild Cat	<i>Felis libica caudata</i>	+	
Red Manul	<i>Otocolobus manul ferrugineous</i>	+, U	Lr/nt
Caspian Seal	<i>Phoca caspica</i>		VU
Marbled Polecat	<i>Vormela peregusna</i>	+, U	
Persian Gazelle	<i>Gazella subgutturosa</i>	+, U	Lr/nt
Chamois	<i>Rupicapra rupicapra caucasica</i>	+	VU
Wild Goat	<i>Capra aegagrus aegagrus</i>	+, U	VU
E. Caucasian Tur	<i>Capra cylindricornis</i>		VU
Argali	<i>Ovis ammon</i>	+, U	VU
Mouflon	<i>Ovis orientalis gmelinii</i>		VU
Long-tailed Marmot	<i>Marmota caudata</i>		Lr/nt
Persian Squirrel	<i>Sciurus anomalus</i>		Lr/nt
Armenian Birch Mouse	<i>Sicista armenica</i>		CR
N. Birch Mouse	<i>Sicista betulina</i>		Lr/nt
	<i>Calomyscus urartensis</i>		Lr/nt
Snow Vole	<i>Chionomys nivalis</i>		Lr/nt
Harvest Mouse	<i>Micromys minutus</i>		Lr/nt
Fat Dormouse	<i>Myoxus glis</i>		Lr/nt

**Table 2. List of Rare and Threatened Birds of Azerbaijan**

Species	Species	ARDB	IUCN
White Pelican	<i>Pelecanus onocrotalus</i>	+, U	
Dalmatian Pelican	<i>Pelecanus crispus</i>	+, U	VU
Eurasian Spoonbill	<i>Platalea leucorodia</i>	+	
Pygmy Cormorant	<i>Phalacrocorax pygmaeus</i>		Lr/nt
Black Stork	<i>Ciconia nigra</i>	+, U	
Greater Flamingo	<i>Phoenicopterus roseus</i>	+, U	
Mute Swan	<i>Cygnus olor</i>	+	
Bewick's Swan	<i>Cygnus bewickii</i>	+, U	
Red-breasted Goose	<b>Branta ruficollis</b>	+, U	

Species	Species	ARDB	IUCN
Ferruginous Duck	<i>Aythya nyroca</i>		VU
Marbled Teal	<i>Marmaronetta angustirostris</i>	+, U	VU
White-headed Duck	<i>Oxyura leucocephala</i>		VU
Osprey	<i>Pandion haliaetus</i>	+, U	
White-tailed eagle	<i>Haliaeetus albicilla</i>	+, U	Lr/nt
Northern Goshawk	<i>Accipiter gentilis</i>	+	
Shikra	<i>Accipiter badius</i>	+	
Steppe Eagle	<i>Aquila rapax</i>	+, U	
Imperial eagle	<i>Aquila heliaca</i>	+, U	VU
Golden eagle	<i>Aquila chrysaetos</i>	+, U	
Lammergeier	<i>Gypaetus barbatus</i>	+, U	
Black (Monk) Vulture	<i>Aegypius monachus</i>		Lr/nt
Pallid harrier	<i>Circus macrourus</i>		Lr/nt
Short-toed Eagle	<i>Circaetus gallicus</i>	+, U	
Saker Falcon	<i>Falco cherrug</i>	+, U	
Peregrine Falcon	<i>Falco peregrinus</i>	+, U	
Lesser Kestrel	<i>Falco naumanni</i>		VU
Caspian Snowcock	<i>Tetraogallus caspius</i>	+, U	
Caucasian Snowcock	<i>Tetraogallus caucasicus</i>	+	
Black Francolin	<i>Francolinus francolinus</i>	+, U	
Pheasant	<i>Phasianus colchicus</i>	+	
Caucasian Black Grouse	<i>Tetrao mlokosiwiczii</i>	+, U	Lr/nt
Purple Gallinule	<i>Porphyrio porphyrio</i>	+, U	
Corncrake	<i>Crex crex</i>		VU
Great Bustard	<i>Otis tarda</i>	+, U	VU
Little Bustard	<i>Tetrax tetrax</i>	+, U	Lr/nt
Houbara Bustard	<i>Chlamydotis undulata</i>	+, U	
Sociable Plover	<i>Chettusia gregaria</i>	+, U	
White-tailed Plover	<i>Vanellus leucurus</i>	+	
Black-winged Pratincole	<i>Glareola nordmanni</i>	+	
Black-bellied Sandgrouse	<i>Pterocles orientalis</i>	+	
White-throated Robin	<i>Irania gutturalis</i>	+	
Sombre Tit	<i>Parus lugubris</i>	+	
Trumpeter Finch	<i>Rhodopechys gitadineus</i>	+	

**Table 3. List of Rare and Threatened Reptiles and Amphibians of Azerbaijan**

Reptiles	ARDB	IUCN	Amphibians	ARDB	IUCN
<b>Testudo graeca iberia</b>	+, U	VU	<b>Triturus vulgaris</b>	+	
<i>Testudo horsfieldii</i>		VU	<i>Triturus cristatus</i>	+	
<i>Emys orbicularis</i>		Lr/nt	<i>Pelobates syriacus</i>	+, U	
<i>Agama ruderata</i>	+, U		<i>Pelodytes caucasica</i>	+, U	
<i>Phrynocephalus helioscopus</i>	+, U		<i>Bufo verrucosissimus</i>	+	
<i>Mabuya aruata</i>	+		<i>Hyla arborea</i>		Lr/nt
<i>Abiepharus bivittatus</i>	+				
<i>Elaphe longissima</i>	+, U				
<i>Elaphe situla</i>		DD			
<i>Natrix megalcephala</i>		VU			
<i>Phyncolamus melanocephalus</i>	+, U				
<i>Vipera kaznakovi</i>		EN			
<i>Vipera xanthina</i>	+, U				

**Table 4. List of Rare and Threatened Fish of Azerbaijan**

Fishes	ARDB	IUCN
<b>Acipenser guldenstaedti</b>		EN
<i>Acipenser nudiventris</i>		EN
<i>Acipenser persicus</i>		EN
<i>Acipenser stellatus</i>		EN
<i>Huso huso</i>		EN
<i>Alosa pontica</i>		DD
<i>Clupeonella cultriventris</i>		DD
<i>Barbus cyclolepis</i>		DD
<i>Caspiomyzon wagneri</i>	+	
<i>Salmo fario</i>	+	
<i>Abramis sapa bergi</i>	+	
<i>Pelecus cultratus</i>	+	DD
<i>Lucioperca marine</i>	+	
<i>Rutilus frisii</i>		DD
<i>Sabanjewia aurata</i>		DD
<i>Stenodus leucichthys leucichthys</i>		EN
<i>Stenodus leucichthys</i>		DD
<i>Syngnathus nigrolineatus</i>		DD
<i>Stizostedion marinum</i>		DD

I = Indeterminate; R = Rare; En = Endangered; En/Ex = Endangered/Extinct

Lr/nt Lower threat/near threatened; Lr/cd Lower threat/conservation dependent;

VU Vulnerable; CR Critically endangered; EN Endangered; DD Data deficient; NE Not evaluated

## Azerbaijan Species on IUCN Red List of Threatened Plants

Family	Species	Status
Alliaceae	<i>Nectaroscordum tripedale</i>	I
	<i>Nectaroscordum dioscoridis</i>	I
Orchidaceae	<i>Ophrys caucasica</i>	I
	<i>Ophrys oestrifa</i>	I
	<i>Himantoglossum formosum</i>	I
Cruciferae	<i>Pseudesicaria digitata</i>	I
Labiatae	<i>Stachys talyschensis</i>	En/Ex
Rosaceae	<i>Pyrus raddeana</i>	I
Umbelliferae	<i>Smyrniopsis aucheri</i>	I
Compositae	<i>Cladochaeta candidissimus</i>	I
	<i>Steptorhamphus czerepanovii</i>	I
Leguminosae	<i>Vavilova formosa</i>	I
	<i>Astragalus bakuensis</i>	I
Graminae	<i>Triticum araraticum</i>	I
	<i>Secale vavilovii</i>	I
	<i>Stipa pellita</i>	I
Buxaceae	<i>Buxus colchica</i>	I
Polygonaceae	<i>Calligonum bakuense</i>	I
Liliaceae	<i>Fritillaria grandiflora</i>	I
	<i>Lilium ledebourii</i>	I
Gentianaceae	<i>Gentiana lagodechiana</i>	R
Iridaceae	<i>Iris acutiloba</i>	En
	<i>Iris camillae</i>	I
	<i>Iris iberica</i>	I
Hyacinthaceae	<i>Ornithogalum arcuatum</i>	I
	<i>Ornithogalum hyrcanum</i>	I
Pinaceae	<i>Pinus brutia</i> var. <i>eldarica</i>	R
Primulaceae	<i>Primula juliae</i>	I

I = Indeterminate; R = Rare; En = Endangered; En/Ex = Endangered/Extinct

## ANNEX E

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Attachment: NEAP Priority Actions



## ANNEX F

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### List of Contacts

Name	Occupation
William McKinney	Country Coordinator, USAID/Azerbaijan
Stephen Szadek	Supervisory General Development Officer, USAID/Azerbaijan
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