BIODIVERSITY ASSESSMENT FOR CROATIA

Task Order No. 807 under the Biodiversity & Sustainable Forestry (BIOFOR) IQC

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ACRONYMS

BIOFOR	Biodiversity and Sustainable Forestry
BSAP	Biodiversity Strategy and Action Plan
CITES	Convention on International Trade in Endangered Species
ECCIB	Eco-centre Caput Inulae-Beli
EIA	Environmental Impact Assessment
GEF	Global Environment Facility
IQC	Indefinite Quantity Contract
MoE	Ministry of Environment and Physical Planning
NEAP	National Environmental Action Plan
NGOs	Non-governmental Organizations
SMEs	Small and Medium Enterprises
TA	Technical Assistance

SECTION I

Introduction

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Introduction

This biodiversity assessment for Croatia has three interlinked objectives:

- Summarizes the status of biodiversity and its conservation in Croatia; analyzes threats, identifies opportunities, and makes recommendations for the improved conservation of biodiversity. This information will help USAID Croatia make decisions related to biodiversity conservation.

- Meets the requirements stipulated under Section 119.d (1) & (2) of the Foreign Assistance Act (see Annex A, FAA Sections 117 and 119), required when USAID missions are developing new strategic programs. The assessment also prepares the Mission to address issues arising under Sections 117 and 119 of the FAA by providing information on biodiversity and natural resources in Croatia.

- Analyzes the impact of future USAID activities in Croatia on biodiversity conservation, suggests actions that USAID could support that would improve the status of biodiversity conservation in Croatia and are consistent with current USAID programs, and identifies special opportunities for the Mission in the area of biodiversity conservation.

The assessment was funded by the USAID Croatia Mission 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 Richard Warner and Goran Susic worked in Croatia from 15 November to 4 December 2000.

The approach used in the assessment was to collect and analyze information on biodiversity and related areas through document research, interviews with key individuals in organizations concerned with biodiversity (see Annex C for a list of persons contacted), and field trips. In addition to extensive interviews with stakeholders in Zagreb, the team met in Rijeka and Split with "state" (i.e., federal) and county agencies, other governmental institutions and NGOs. The team also visited Plitvicka Jezera National Park, Lonjosko Polje Nature Park and Kruna Special Ornithological Reserve on the Island of Cres, thereby experiencing firsthand many of the major landscapes and biomes in Croatia and three of the most important types of protected areas. The recently completed national Biodiversity Strategy and Action Plan (BSAP) was a major source of information for this assessment report.

The authors wish to thank those individuals interviewed in the course of the study and the many experts who provided information to the BSAP and other reports that greatly facilitated this assessment.

SECTION II

Status of Biodiversity

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Status of Biodiversity

A. Overview

The biodiversity of the Balkans is a mixture of continental European, alpine and Mediterranean influences. Conservation International has identified the Mediterranean Basin as a global "hotspot" – that is, one of the 25 most biologically rich and **most endangered** terrestrial ecosystems in the world. 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 Balkans, in particular Croatia's Adriatic coast, including islands and coastal mountains, is among the most biologically important components of the Mediterranean bio-geographic region. Moreover, the World Wide Fund for Nature has identified Velebit Mountain of Croatia as one of the 10 most important forest areas in the Mediterranean region. And "Europe's Environment – The Dobris Assessment" identifies the Balkans as one of three areas exceptionally rich in endemic species.

Figure A: Location Map of Croatia.

Croatia has a population of 4.8 million people and a land area of 56,610 km^2. The country is distinguished by a 950 km Adriatic coastline and more than 1,200 islands and reefs. The total length of coastline, including islands, is 5,835 km. The principal landscape features are: 1) northern lowlands and hills of the Sava River and Drava River basins; 2) highlands of the Dinarid Alps, with the highest peak reaching 1,831 meters altitude; 3) Mediterranean coast and islands, and 4) Adriatic Sea.

The flora and fauna of Croatia include many species typical of northern Europe and the Mediterranean. However, in Croatia these species are often better protected than elsewhere in their range. The varied terrain and climate, and unique geologic features contribute to a diversity of ecosystems and species. Forests cover about 44% of Croatia, primarily in the mountains and the northern lowlands. Woodlands also occur on parts of the coastal zone and islands. The highland forests are largely intact and continuous in Croatia. Hence, large mammals that require big home ranges, such as bears and wolves, find reasonable habitat in Croatia, while they have declined throughout most of Europe. Wetlands along the northern rivers include globally important habitat for many species. The rivers, particularly the small drainages of the Adriatic coast, harbor numerous rare and endangered fish species. Small wetlands including ponds on the Adriatic coast and islands, and moors (also

called “fens”) in the mountains, provide unique habitat for many threatened species. Croatia possesses a rich agricultural history that is today an important part of biodiversity and its management. Farmers maintain ancient breeds of domesticated plants and animals, and traditional agricultural practices, including grazing, are sometimes integrated with ecosystems dominated by native species.

Critical to assessing biodiversity and conservation issues in Croatia is an understanding of the unique **karst** geology and hydrology. The karst feature in the Balkans is the largest in the world, extending from Slovenia to Albania, including the Dinarid Alps, eastern Adriatic coast and islands. Karst is formed of limestone that, when the dominant geologic feature, produces unusual surface and subsurface phenomena, including sinkholes, fissures, caves and underground rivers. These underground features in particular, support Croatia’s most unique, rare and critically endangered animal species. Indeed, some karst species in Croatia have disappeared in the past decade and many others are teetering on the brink of extinction.

Information about biodiversity in Croatia is poorly developed in comparison to other European countries. It is one of the last countries in Europe without up-to-date checklists of species or country-specific field guides. Basic inventories of species and knowledge of species’ biology are inadequate for many applications, including environmental impact assessments. The subterranean fauna is so poorly known that species new to science will likely be discovered on a regular basis for some years to come; others may vanish before ever being discovered. Inventories and descriptive materials for terrestrial natural communities are insufficient for use in land use planning and ecosystem management, yet an ecosystem approach is exactly what is most needed, particularly in the karst region.

B. Major Landscapes, Ecosystems and Communities

Karst covers 54% of Croatia, from the central mountains to the Adriatic coast and islands, and isolated, but significant patches in the Sava and Drava basins. Many types of ecosystems occur on karst substrate (see Annex D for a map of the major vegetation types in Croatia). More than half of Croatia’s forests, including several types of forests, are found in the karst region, as are Mediterranean scrublands, mountain meadows, screes (loose rock on steep slopes), rivers, small ponds and moors. However, it is the subterranean ecosystems, including the water that supports them, that are most remarkable in the karst region. While karst is best known for its rare species, their conservation requires management of the entire ecosystem. Water moves through karst like a sieve, often collecting to form underground rivers that, in their course, create caves where species live.

Figure B: Distribution of Karst in Croatia: dark green= karst; brown=patches of karst in non-karst area; light green=non-karst area.

The karst region of Croatia has more than 8,000 caves and perhaps 10 times that number still to be discovered. The same water transports nutrients required to support subterranean life. Thus, water creates and maintains the physical space for these unique ecosystems and supplies them with the nutrients essential for a subterranean existence. Many cave ecosystems survive within very narrow ecological limits. Small changes to the physical or biological conditions in the caves or to the hydrologic systems can cause irreparable harm to the biota.

Large wetlands in Northern Croatia have long been recognized for their global importance, most notably for the conservation of migratory birds, but also for their capacity to help control flooding. Two wetlands in Northern Croatia are recognized as Ramsar sites of global significance - Lonjsko Polje Nature Park along the Sava River and Kopacki Rit Nature Park at the confluence of the Drava and Danube Rivers. These sites include a mixture of forests, marshes and ponds and provide protection to numerous species threatened in Europe, including white-tailed eagles, black and white storks and spoonbills. Nature parks include substantial timber harvest, agriculture and fisheries. Levees hold back the water in some places, while other areas are allowed to flood in a more or less natural cycle. Many wetlands are drained and used as pastures, for hay or other crops. Another important and very different wetland and Ramsar recognized site is found near the mouth of the Neretva River along the southern Adriatic coast.

Small wetlands and ponds found along the coast and Adriatic islands are of particular importance for biodiversity conservation. They host locally rare and threatened species and provide refuge for migratory birds in this otherwise dry region.

Rivers in the karst region support many rare species of fish, some of which are endemic to Croatia or even to a single river. In particular, the small, short rivers that drain into the Adriatic support many rare and threatened species. Some of the karst rivers vanish underground. Others are associated with unique wetlands that are flooded part of the year and dry at other times. Fish species in these wetlands apparently move into the underground system and then return to the surface, following the cycle of the water, but it is not known how this dependency on hydrology relates to the species' biology and lifecycle. Unfortunately, the water systems in these wetlands are increasingly regulated for agriculture, thereby threatening the biota with compound problems of changing hydrology and increasing pollution.

The Biodiversity Strategy and Action Plan (BSAP) identifies marshes and waters (i.e., rivers, including those in caves) as the most threatened ecological systems in Croatia.

Forests are an important economic resource in Croatia and a well-conserved biotic community. Oaks, mixed with ash, alder and poplar, most often dominate lowland forests in Northern Croatia. The mountain forests of central Croatia are often dominated by beech mixed with evergreens, or by evergreens including spruce, pine and yew. Oaks and hornbeam characterize forests in the coastal highlands and on the islands. The area coverage of forests has not declined in the past 100 years and a natural composition of species is found in 95% of Croatian forests. However, rotational cutting is intense, leaving few mature forests containing the important habitats provided by decaying and fallen trees. Nevertheless, Croatia's large, interconnected tracts of forest of primarily natural composition are a biological resource of global importance.

The presence of large mammals, such as wolves and bears attest to the integrity of the mountain forest ecosystem in particular.

Recent research by the Institute of Tourism found that forests are valuable for attracting tourists. Croatians have long recognized that the coast and islands attract tourists. New evidence shows that many tourists also want to experience the forests of Croatia.

Several small, unique natural communities are also found in Croatia. For example, screes are areas of loose rock on steep hills. They mostly lack vegetation, but in some places they harbor unique species, such as the Velebit degenia (*Degenia velebitica*), a monotypic genus endemic to the Velebit Mountain range (the genus has one species, which is found only on screes in Croatia). Meadows in the mountains are a unique habitat, maintained in part by grazing by domestic livestock. Declining rural populations have resulted in reduced grazing in recent years, causing some meadows to become overgrown, threatening the ecological balance required of species that favor the open meadows. Grasslands elsewhere in Croatia are substantially anthropogenic, but still harbor important species, including rare and threatened species.

Moors, another characteristic natural community occurring only in small patches, are found in the central and coastal mountains (in the karst region) where they depend on a unique hydrology. The few remaining moors (also called “fens”) in Croatia support unique vegetation types and many locally rare species, such as round-leaf sundew, a carnivorous plant. The biota of these small wetlands is often sensitive to disturbance. The most important remaining moors are near Ogulin, in the Gorski kotar region, north Velebit Mountain, Lika region, near Karlovac, and north of Zagreb (Hvatsko zagorje).

The Adriatic Sea is a unique biogeographic unit of the Mediterranean, most notable for the high number of endemic species. The BSAP reports that upwards of 7,000 plant and animal species have been found in the Adriatic thus far and many more (invertebrates in particular) are likely to be discovered. The central Adriatic is particularly rich in endemic plant species, with at least 535 species of green, brown and red algae. Several rare and threatened species, such as the monk seal and sea turtles find safe haven in Croatian waters of the Adriatic. The Croatian side of the Adriatic is clean and clear relative to the Italian coast, in part because the predominant currents of the Sea circulate counterclockwise – up the Dalmatian coast of Croatia and back down the Italian coast, bring clean water up the Croatian coast and increasingly polluted water back down the Italian coast. As a result, the bottle-nosed dolphin (*Tursiops truncates*) is still common in the Croatian part of the Adriatic, yet has been extirpated from the Italian part. Even so, the Adriatic in Croatia, the near coastal areas in particular, is seriously threatened with pollution and over exploitation. The highly productive shallow water ecosystems near the coast are threatened by intensive filling for construction, which, combined with pollution, has eliminated habitat for species like the Adriatic wrack (*Cystoseria sp.*), an endemic brown algae.

C. Species Diversity

Of 34 countries in Europe, Croatia ranks second for the number of fish species (behind much larger Turkey), third for estimated number of invertebrates, fifth for number of reptiles, and seventh for number of vascular plants. When number of species is considered in relation to land area, Croatia ranks third for number of plant species per unit area (behind Albania and Slovenia)

and fourth for number of vertebrates per unit area (behind Albania, Slovenia and Slovakia). Thus, Croatia is among the most biologically rich countries in Europe.

Endemic species are those restricted to a particular area, and so their fate depends entirely on protection and management in that limited area. Within the Balkans, there is an unusually high concentration of endemic species, particularly in the karst region extending from Slovenia to Albania, centered on the Dinarid Alps, Adriatic coast and islands of Croatia. For example, at least 11 species of fish are (or in some cases, were) found only in the karst region of Croatia. More than two dozen other Croatian fish species are shared with one or another of their neighbors, but restricted to the karst formation.

Troglocaris anophthalmus- A very rare cave-dwelling crayfish that is vulnerable to changes in the ground water level from the regulation of watercourses associated with construction of hydroelectric power plant reservoirs (Zala Cave, Kordun region. Photo by S. Gottstein).

Cave dwelling species are even more unique, diverse and often more restricted in their range. There are more then 8,000 known caves, sinkholes and underground rivers distributed throughout Croatia, including on the Adriatic Islands. In 1994 scientists discovered a new species of leech, *Croatobranchus mestrovi*, in a 1300 meters deep cave in Velebit Mountain. Still known only from the one cave, this unique species is the only representative of its genus and family – there is nothing remotely similar anywhere in the world. Dry caves also support many rare and endemic species.

The status of information in Croatia makes estimates of extinction and endangerment difficult and the numbers reported somewhat unreliable (see Annex E for list of endangered species of Croatia). With further research some species will be found to be more widespread and less threatened that currently reported. However, the experience of the past three decades in the U.S. and discussions with Croatian scientists suggest that the situation is actually worse than reported, with more species imminently threatened with extinction or already extinct.

C1. Flora

There are 4266 species of flowering plants and conifers (more than 5,337 including subspecies), 2,597 algae and 638 mosses reported for Croatia. Approximately 6% of the taxa of flower plants and algae are endemic to Croatia. The greatest number of endemic flowering plant species is found on the mountains of Velebit and Biokaovo. In the Adriatic 12% of the algae species are endemic. Approximately 10.5% of mosses and higher plant species in Croatia are threatened according to IUCN categories. Only 44 species are legally protected under Croatian law. At least another 92 species deserve strict protection because they are seriously threatened. The phytoplankton, algae, lichens and mosses are poorly documented in Croatia. Little is known

about the distribution and biology of most species and many additional species will likely be discovered here.

C2. Fauna

Only about 24,000 species are reported for Croatia, or about 40% of the animals anticipated for the country, based on estimates derived from the known distribution of species in the region. The least known animals are the invertebrates, with approximately 54,000 species anticipated. Among vertebrates there are a remarkably high percentage of endemic species among reptiles (52%) and freshwater fish (31%).

C2a. Mammals

Croatia has 101 mammals plus domestic species, including 15 species and eight subspecies that are threatened. Sea mammals, bats and small rodents join the familiar large mammals on the threatened list.

C2b. Birds

There are 371 species of birds known from Croatia, of which 226 nest here. Seven species have been extirpated from Croatia and another 145 are considered threatened (41%). Loss of wetlands is the greatest single threat to birds in Croatia. Despite legal protection, another significant threat to birds is poaching.

C2c. Amphibians and Reptiles

Twenty amphibians are known from Croatia, including six threatened species. All amphibians are legally protected. At least 38 species of reptile are found in Croatia. However, there are another 45 subspecies of reptile that are endemic to the Adriatic coast and islands. Little is known about these subspecies. Many are restricted to a single island. All species except the horned viper and common adder are legally protected. However, effective protection will require strict controls to prevent introductions of exotic species to the islands; perhaps a difficult task considering the massive movement of tourists in the region.

C2d. Fish

Croatia has 145 known kinds of freshwater fish, of which 33 are endemic to the region and 11 endemic to Croatia. Forty-one of the endemic species are found in the Adriatic catchments. Dalmatia's rivers Zrmanja, Krka and Neretva are particularly important for fish diversity. 110 of the 145 species are threatened in Croatia. Many of the freshwater fish species are poorly known and incompletely described. Many areas have not been surveyed for fish. Despite the overwhelming evidence of fish endangerment and five species already extinct from Croatian waters, no fish species are legally protected in Croatia.

There are about 410 species and subspecies of marine fish in the Adriatic Sea, or about 70% of the taxa reported for the entire Mediterranean. Seven species are endemic to the Adriatic. At least 64 species (15.5%) of the species are threatened, primarily as a result of over fishing. While a number of fish are protected by law, only 16 of the threatened species are so protected.

C2e. Invertebrates

Although more than 55,000 species of invertebrate are predicted to live in Croatia, only about 17,500 have been recorded to date. Obviously the group is poorly explored, largely due to a lack of experts or the resources to train and employ them. A few groups of insects are well enough studied to support some general observations. So far 730 endemic species of invertebrates have been identified, including snails, crabs, beetles, pseudoscorpions, and earthworms. The highest levels of endemism are in underground species of snails and isopods, each group with more than half the underground species endemic to Croatia (Table 1), most often associated with aquatic systems in caves. Most groups of invertebrates are too poorly studied to estimate endemism and threats.

Table 1. Endemism of selected groups of invertebrates.

Group	No. of taxa	No. of endemics	% endemics
MOLLUSCA			
Gastropoda (snails)			
Aquatic	129	79	61%
Terrestrial	481	304	63%
ARTHROPODA (insects and relatives)			
Pseudoscorpiones	80	27	34%
Opiliones (harvestmen)	77	29	38%
Isopoda (sowbugs, pillbugs and relatives)			
Aquatic	24	12	50%
Terrestrial	133	74	56%
Diplopoda (millipedes)	175	75	43%

Terrestrial species of invertebrates are likewise poorly known. However, a few exceptions indicate evidence of habitat deterioration. Dragonflies are a sensitive indicator of conservation of aquatic systems and water quality and they often live in very restricted habitats. Of the 65 kinds of dragonflies in Croatia, 14 are threatened in Croatia and 15 more across all of Europe.

D. Agro-biodiversity

Modern agricultural practices often encourage replacing local breeds with a few hybrid plants and animals, which are more responsive to specialized foods, fertilizers and pesticides. The new hybrids general out-perform the local stock, but compared to local breeds, the introduced breeds are more likely to fail under adverse conditions or when farmers can no longer afford or obtain the specialized nutrients and pesticides. From a biodiversity perspective, we also lose forever the genetic traits that over the past few thousand years were selected to strengthen breeds to meet local conditions.

Croatia has important local breeds of cattle, horses, donkeys, sheep, goats, pigs and poultry, and important local varieties of olives and grapes. However, a comprehensive inventory of domestic crops and breeds has not been made in Croatia. More attention must be paid to the protection of the diversity of crop species and domestic animal breeds in Croatia.

E. Threats to Biodiversity

The major threats to biodiversity in Croatia include water pollution, water management (e.g., dams and diversion canals), habitat fragmentation, over exploitation, and the introduction of exotic species.

Among the most serious and immediate threats to biodiversity in Croatia is pollution resulting from inadequately treated wastewater, unregulated landfills, and other urban, industrial and agricultural runoff. Subterranean biota in the karst region are seriously threatened by changes in water quality, including increases in nutrient content, the addition of pesticides and other chemicals. Pollution from the city of Ogulin is cited as the cause for the decline and extinction of cave species. Cities and villages throughout the region are mostly without sewage treatment and sinkholes are a favorite place for landfills.

Rivers, lakes, wetlands and the Adriatic Sea are likewise threatened by these same sources of pollution. Rivers, particularly in the karst region where many fish species are endemic to one or a few streams, are vulnerable to changes in water quality. Some of the threat to rare riverine fish and other karst species originates in Bosnia and is compounded by the problems of water management in Croatia.

Dams for hydroelectric power production, water diversion projects for drinking water, canalization and draining for agriculture have seriously compromised the ecology and species diversity of the rivers and wetlands in Croatia. Hydroelectric and flood control dams built in the past 20 years (many in the past 10 years) have caused the extinction of species and continues to threaten dozens of additional species. Recent surveys in the Krka River basin failed to find 11 species previously reported for that river before the construction of three dams.

Monolistra pretneri: This eyeless and mostly depigmented isopod only occurs in Croatia, where it inhabits karstic springs and caves with flowing water. Since this species is known mostly from caves and springs in the vicinity of settlements, it is threatened by pollution and groundwater changes due to construction of power plant reservoirs on the rivers Armanja and Krka (Milkacka cave. Photo by D. Pelic).

Draining of wetlands is another serious threat to biodiversity in Croatia. Large expanses of wetlands in the Sava and Drava basins have been drained and converted to agriculture. The decline of these wetlands, among the most important in Europe, prompted donor agencies and international NGOs to strengthen the protected areas responsible for managing large tracts of remaining wetlands along these rivers. However, there remain threats to expand the water management projects to improve shipping and increase agricultural production, actions that would negatively impact the protected areas and the species they protect.

A less recognized, though possibly more serious problem is the draining of wetlands and consequent increase in agriculture in the karst region, a process that has been going on for 150 years. The negative impacts are threefold: 1) the loss of wetlands directly deprives wetland

species of habitat essential for their survival; 2) changes to the surface and subterranean hydrology eliminates or radically changes essential habitat for the numerous endemic and endangered riverine and subterranean species; and 3) increased turbulence, sedimentation, nutrient load and toxic chemical inputs can directly kill endangered species or eventually overwhelm the sensitive karst ecosystems and thereby cause the extinction of species. Of particular concern is the draining of the rare and most seriously threatened moors.

Habitat loss and fragmentation is a substantial threat to the forest ecosystems in Croatia. The populations of large mammals, including lynx, bear and wolves are important indicators of the biological diversity of the mountain forests. Roads, agriculture and urban growth are fragmenting the forest into discontinuous patches, which are too small to sustain viable large mammal populations. Indiscriminate poisoning is also eliminating large mammals, which in turn threatens endangered species of raptors feeding on contaminated carrion. The physical plans for this region should provide for broad bands of forest to run uninterrupted from Slovenia to Bosnia. Cross-boundary coordination should link the Croatia forests with protected, managed forests in neighboring countries.

Exotic species are a growing problem for native biota of Croatia. False indigo (*Amorpha fruticosa*) is a serious problem to native habitats and agriculture in and around the wetlands of the Sava and Drava basin. Introduced trout species are hybridizing with rare endemic species of trout, a process that threatens to eliminate a recognizable native species. During this project the team identified pokeweed (*Phytolacca americana*) in the protected area on the Island of Cres. This species is a known pest species in Mediterranean climates and is poisonous to sheep and other livestock. Here it was growing as an ornamental in an area where sheep are the primary livelihood. The green algae *Caulerpa sp*. is aggressively spreading through the Adriatic, displacing native and endemic species.

New hybrid breeds replacing traditional local breeds threaten agricultural biodiversity. In some cases the genetically pure stock of traditional breeds are being slowly lost, as the local breeds are increasingly newly introduced breeds.

Pollution is a serious threat to the biota of the Adriatic Sea. Discharge from rivers and coastal towns has caused serious deterioration of ecosystems in many bays along the Croatian coast. Litter, plastics in particular, is a concern as both an eyesore and a danger to marine resources. Over harvest of fish, both freshwater and marine, is another serious problem for the endangered fish of Croatia. Commercial fisheries, from large commercial operations in the Adriatic to small operations along the coast and in the rivers, are not effectively monitored or regulated. Excessive trawling is disrupting habitats on the bottom of the Adriatic and increasing turbulence. Sport fishing and collecting by individual divers is also threatening some species.

An iris (*Iris illyrica*) endemic to the islands and coast of the northern Adriatic (photo by G. Sušic).

Poor monitoring and regulation of the collection of wild plants are perhaps other problems, but little information is available to determine if these practices are having a negative impact on species and ecosystems. Particularly vulnerable are the species that produce bulbs and showy flowers. This includes endemic, rare and threatened species. Note that an unusually high percentage of plant species in groups most often threatened by amateur and professional collectors around the world (e.g., lilies, irises, orchids, etc.) are also listed in the Croatian Redbooks of endangered species. Regulation of collection and trade of these species, combined with horticultural and market research, might help to protect the wild biological resources while developing business and employment opportunities in the rural sector.

SECTION III

Status of Biodiversity Conservation

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A. Protected Areas

There are 352 protected areas in Croatia, covering over 9.9% of the country (excluding territorial seas) (see Annex F for maps indicating Protected Areas in Croatia). Six proposed new nature parks would raise the total protected areas to 14%. The term "protected areas" should be qualified. Only eight of the areas, covering about 1.4% of the country, are National Parks that allow for strict protection of biodiversity and are primarily owned by the state. All of the other areas are multiple-use zones with the potential to be managed for biodiversity conservation, but in concert with agriculture, forestry and urban requirements. These areas might be owned by the state, be in private hands or have mixed ownership. For example, forested lands in Lonjosko Polje Nature Park are approximately 20% privately owned and 80% state owned. Much of the private land is dedicated to agriculture and the state land that is forested is systematically logged.

As directed by the Law for Nature Protection, protected areas are to be managed by special public institutions. For the ten Nature Parks and eight National Parks, these institutions are established by the national government. County governments, or municipal governments in a few cases, are charged with establishing these special institutions for the other 334 protected areas: To date, these exist for only four areas. The government expects to move jurisdiction of 77 additional reserves – the Strict Reserves and Special Reserves – from county to state jurisdiction. However, the state does not have the resources to establish management of these important biological reserves.

The Ministry of Environment and Physical Planning (MoE) has a national protected areas unit with six employees who have very little authority over the individual parks. In reality, there appears to be no effective central authority over the protected areas system of Croatia. The special private institutions established to manage the parks, having received their authority directly from the Cabinet, are autonomous from the MoE, and each operates as a separate government institution.

Individual national parks vary tremendously in management capacity. Plitvicka Jezera National Park, with an area of 295 km^2, has 650 employees. Lonjsko Polje Nature Park, with an area of 506 km^2, has 6 employees. Most national parks and nature parks have from 5 to 30 employees. Management philosophy of national parks and nature parks varies widely, with the park director deciding if protection of biological diversity is a priority or not.

Protection and management of biodiversity is a priority in only a few of the National Parks and Nature Parks. Lonjsko Polje Nature Park, with 6 staff members, is doing a good job of working in cooperation with villages, farms, Croatian Forests, and Croatian Waters to develop and implement management practices that are compatible with conservation of biodiversity in the park. By contrast, Plitvicka Jezera National Park, an internationally acclaimed World Heritage site with 650 employees and more than a million visitors each year, is primarily managed as a

tourist resort, quite possibly to the detriment of the extraordinary biodiversity in the park. Whatever the intent of the park managers, most of the national parks and nature parks lack funding to achieve the most basic protection and management.

Counties have established public management institutions for only a few (less than 10) of the 334 other protected areas in Croatia, and the interest of these institutions is more likely to focus on tourism than protecting biological diversity.

One of the Nature Reserves is effectively, though perhaps unofficially, managed by an NGO working in cooperation with county and municipal governments. Eco-centre Caput Inulae-Beli (ECCIB) is actively managing the Kruna Special Ornithological Reserve on the Island of Cres, with the last Croatian colonies of Eurasian Griffon (Gyps fulvus). The county and the municipality contribute resources on an annual basis. USAID provided support for this program to create a sustainable development plan based on community consultation, provide a model for such planning in other communities and to develop best practices demonstration project of sustainable ecotourism.

Tourism has increased in several parks as infrastructure is built to enhance the tourists' experiences and accommodate their needs. Plitvicka Jezera National Park, the most visited park in Croatia, has extensive trails with spectacular views and interpretive programs. The park has also built lodges near the most famous attractions, a series of lakes and waterfalls cascading through a mountain gorge. However, the lodges apparently lose money and are only sustained by subsidies from the entrance fee to the park. ECCIB has constructed four trails that lead tourists through the cultural and natural history of the Island of Cres. Printed brochures, signs along the trails, and professional tour guides employed by the NGO educate the tourists about biodiversity of the region and the ancient civilizations that have lived on the island. Eco-centre Caput Inulae-Beli also assisted with the creation of a new NGO that employs locals in Cres to produce handcrafts for tourists. The primary material for their handcrafts is wool. Wool is an environmental problem, because the shepherds otherwise discard the wool in the woods and pastures. Thus, an environmental nuisance is being converted into a commercial opportunity. These improvements in the parks and special reserves provide employment and business opportunities in the rural sector.

The actual need for biodiversity protection is much greater then current information indicates. The Rijeka country physical plan identified 110 sensitive biological features that might be recommended as new protected areas, in addition to the 29 areas that the county is already responsible for.

B. Conservation Outside Protected Areas

Physical plans at the county and municipal levels, environmental impact assessment (EIA) and the process of acquiring project/building permits are all tools potentially providing opportunities for protecting biodiversity outside of the national parks. That includes nature parks, hundreds of other "protected" areas, and non-protected sites. Something more is needed for marine protection, where over harvest by commercial fisheries and impacts by tourists threaten biodiversity. The MoE does have inspectors for environmental protection, but they are too few to actually patrol and enforce regulations.

Croatian Forests, a parastatal organization, manages timber production from the nation's forests. State forests are managed under 10-year plans with trees of different species cut at different ages depending on their biology. Oaks, for example are cut on a rotation of between 120 to 160 years. While biodiversity protection is not a priority mandate of Croatian Forests, their practices have thus far maintained healthy forest ecosystems for at least some species. However, in other cases forests have been harvested and threatened biodiversity was compromised, impacting, for example, the nesting of white-tailed eagles. Too few dead trees are left to provide habitat for fungi, insects, birds and other biodiversity. The project team was also told of a recent example where Croatian Forests accelerated their cutting schedule in order to harvest timber in a decreed national park before the MoE could set up the infrastructure needed to effectively establish management control of the area.

Forest fires are a problem for management of biodiversity inside and outside the protected areas. There has been a substantial increase in both the number and severity of fires in the past five years. These are attributed in part to dry weather, but also to an increase in fuel load on abandoned agricultural land; many of these lands were abandoned after WWII and some during the war last decade. The management of these fires requires cooperation among ministries and state institutions, in this case MoE, Ministry of Agriculture and Forestry, and Croatian Forests.

Hunting and collecting of wild products, including marine resources, is largely unregulated. Hunting concessions are provided to groups. The most important hunted species are deer and boar. Bear are also hunted. Intolerance of large predators, like wolves and lynx, leads to their being killed in substantial numbers, despite laws to protect them. Tourists that hunt too often have an attitude of indiscriminate shooting. There is also no patrolling or enforcement of hunting laws. Wild spices, medicinal herbs, mushrooms, sweet chestnuts and other plant products are collected, largely for export. Although information is sketchy, over harvest and the use of inappropriate harvest

The data-shell (*Lithophaga lithophaga*) is highly prized delicate tasting shellfish of rocky coastal areas of the Adriatic. The species lives in drill-holes it creates in rocks. Harvesting and trading is strictly prohibited, yet collection continues, with great loss of habitat as the rocks are broken open to extract the shells.

techniques are apparently threatening the resource base.

C. Ex-situ Conservation

With the exceptions of agro-biodiversity described above, botanical gardens and zoos in Croatia do not participate in international programs of breeding of endangered species or otherwise actively cultivate and protect ex-situ populations of endangered species. However, there are plans to establish national gene banks for plants and domestic animals.

SECTION IV

Strategic and Policy Framework

SECTION IV

Strategic and Policy Framework

A. Policy Framework

Environmental and natural resource policy in Croatia reflects the national laws and international agreements described below. The National Environmental Action Plan (NEAP) and the National Biodiversity Strategy and Action Plan (BSAP)[1] provide an overview of current policy and how it will be implemented. The NEAP should be completed early next year. It largely focuses on addressing the environmental requirements of accession to the EU. Major themes of the draft NEAP related to biodiversity include:

- Protection of biological diversity and landscapes
- Management of forests
- Management of sea and coastal areas
- Management of soils
- Waste management
- Water management

The NEAP priorities include:

- Strengthen the position of the line ministry to extend its authority to certain areas, such as water protection, soils and forests.
- Provide preconditions for drafting regional, local and sectoral environmental protection plans.
- Expand the authority of local and regional administrations and secure cooperation on the horizontal and vertical level; strengthen the local administration on personnel and financial levels.
- Formal and informal groups involved in the drafting of the plan and implementation; including promotion and enabling of NGOs and participation of all stakeholders.

Investment strategies of the NEAP address the issues of pollution from wastewater and landfills. However, wastewater management is focused on towns with more then 15,000 inhabitants, evidence that the problem of inadequate waste treatment is serious and that correcting the problem will take many years. A section of the NEAP focuses investments on islands and coastal areas, including development of integrated physical plans, treatment of wastewater and landfills. Finally, a section on protection of biological diversity calls for a comprehensive inventory and mapping of the components of biological diversity.

The BSAP provides details of the policy and investment strategies for biodiversity conservation. The Croatian Legislature adopted the BSAP in 1999. The English translation is due to be printed

[1] The BSAP document title is *Strategy and Action Plan for the Protection of Biological and Landscape Diversity of the Republic of Croatia*.

in December 2000. The team preparing this report was provided an advanced draft of the English translation.

General strategic objectives outlined in the BSAP are:

- To undertake an integrated inventory of the elements of biological and landscape diversity
- To map the distribution of the elements of biological and landscape diversity
- To document the state of endangerment of the elements of biological and landscape diversity
- To prepare action plans for protection of the threatened elements of biological and landscape diversity
- To implement action plans for the protection of the threatened elements of biological and landscape diversity
- To monitor changes and measure effects of the action plan implementation
- To develop implementation mechanisms (including legislative and institutional framework, education, development of scientific resources, information, financing mechanisms, etc.)

Specific action plans are organized under the following categories:

- Landscape preservation
- Protection of ecological systems and habitats
    - Wetlands and waters
    - Karst and underground
    - Forests
    - Sea
    - Grasslands and arable land
    - Coast and islands
    - Habitats
- Protection of species and subspecies
- Protection of genetic diversity of domesticated taxa
- Protection through sectors
- Strengthening of legislative and institutional framework
- Improvement of the Scientific base
- Improving public education and information

The BSAP projects more than 100 actions plans, divided into four categories of priority: 1) priority plans to start immediately, 2) short-term plans to start within the next five years, 3) medium-term plans to start in the next 5-10 years, and 4) long-term plans. Although scores of the highest priority actions are identified, only 4-5 plans have started implementation in the first year. Most stakeholders consider the BSAP a good review of the status of biodiversity and its threats in Croatia. In fact, the BSAP process advanced the status of knowledge regarding biodiversity in Croatia. There is perhaps less agreement about the conclusions of the BSAP, the prioritization of actions and the feasibility of implementation.

B. Institutional Framework (government, academic, NGOs, private sector)

The Ministry of Environment and Physical Planning (MoE) is divided into nine divisions, three of which relate directly to natural resources. The Division of Nature Conservation has three departments responsible for protected areas, drafting the law for nature protection, writing and coordinating the BSAP and the NEAP, providing the Focal Point to the Convention of Biological Diversity (CBD), and managing major natural resource projects funded through bilateral and multilateral agreements. Other departments are responsible for permits, inspection and enforcement. The MoE is responsible for environmental policy and protection, but the environment component of the Ministry apparently lacks the resources and the political clout needed to enforce its mandate on other ministries and state institutes that have the greatest direct impact on the environment.

The Ministry of Agriculture and Forestry develops policy and programs for agriculture, rural development, food processing, forestry, hunting, and fisheries, including marine fisheries. A parastatal organization, Croatian Forests, is responsible for managing forests on state lands. The focus is on generating income from timber harvests. Biodiversity protection and management is not high on the agenda of Croatian Forests. For example, there is little or no attempt to identify rare or protected species prior to harvesting a tract. Forest districts prepare 10-year plans that guide the harvesting regime. Some observers suggested that forest plans are based on inadequate information and that there is a lack of transparency and accountability in the forestry sector.

Many state authorities are being decentralized to county and local governments. The most important of these are the physical plans and associated processes for permits for development projects and construction and EIA, and the responsibility for protection and management of more than 90% of the "protected" areas of Croatia. As described above, except for 8 national parks and 10 nature parks, all other protected areas are under the authority of the counties and municipalities, where there is essentially no capacity to protect and manage or even monitor the globally endangered resources under their guardianship.

There are 21 counties in Croatia, subdivided into 416 municipalities and 122 towns. Counties and municipalities are required to prepare physical plans (= land use plans). These plans are the foundation for managing growth, limiting pollution, and protecting biodiversity outside the eight national parks. As the municipal plans, country plans and the national physical plan are being drafted, there is an urgent need for these efforts to be compared and integrated, lest each area assumes that it will focus exclusively on tourism promotion, leaving nature protection to another area. Only two counties and two municipalities have completed physical plans. The state is pressuring localities to finish the plans in the next two years, but there is insufficient money and expertise to meet this challenge. Primorsko-Goranska county, including the city of Rijeka and nearby Islands, has done a good job with their initial planning process, including preparation of a substantial catalogue of biological features. Their plan is instructional in that there are 27 official protected areas in the county, but the plan completed this year identified another 110 areas that need some form of protection. If the plans for other counties are produced without sufficient resources and expertise, biodiversity will be insufficiently taken into account. Even with an adequate plan, new models are needed for how the counties' information will be used by state institutions like Croatian Forests to protect biological resources.

The academic and research institutions in Croatia are a critical part of the institutional support for biodiversity protection. They train scientists, conduct research, publish natural history accounts and status reports, manage scientific collections and archives and serve on public and NGO committees and commissions. Among the most important institutions are:

Zagreb University
- Faculty of Science (Departments of Botany and Zoology) - Zagreb
- Faculty of Forestry

Croatian Natural History Museum - Zagreb
Croatian Academy of Sciences and Arts – Zagreb
Institute of Ornithology - Zagreb
Teacher Training College – Osijek
Institute for Oceanography and Fisheries – Split
Institute for Oceanography and Fisheries – Dubrovnik
Institute for Oceanography – Rovinj
Institute for Adriatic Crops and Karst Reclamation – Split

While the universities and research institutions provide a critical source of professional biologists, they fall far short of meeting current and future demand. There are too few biologists with field experience adequate to inventory species, conduct environmental impact assessments, assist with preparing and evaluating physical plans and management plans, and to support independent monitoring of the largely government run conservation programs.

There are few environmental non-governmental organizations (NGOs) in Croatia. The state actively restricted NGO development over the past 10 years, but this is changing under the administration elected in 2000. Nevertheless, only two environmental NGOs have more than one fulltime staff person. Green Action was founded in 1990 to promote environmentally sound and sustainable development by encouraging public participation in decision-making relevant to environmental issues. It provides expertise, advice and information on environmental issues to individuals, communities, schools, and other NGOs in Croatia. It has catalyzed change through projects, campaigns and direct actions. Funding has come from USAID, the Dutch government (MATRA grant program), the Swedish government (for an energy project) the Croatian Government program for NGO support, WWF and the Swedish NGO Secretariat on Acid Rain. Green Action has 10 employees.

Eko-centre Caput Insulae-Beli (ECCIB) was founded in 1993 in order to protect natural and historical features on the northern end of the Island of Cres, and in particular to protect and manage the Eurasian griffon vulture, an endangered raptor species nesting in the Nature Reserve on the island. Funding has come from USAID, state government program for NGO support, the county of Rijeka, the city of Cres, individuals and corporations. ECCIB has six fulltime employees and a large program for volunteers willing to support research and conservation activities. Volunteers are required to pay for this privilege. There is a public education center on the island and several self-guiding trails for natural and historical exploration of the island.

Many other NGOs take the form of professional societies, such as the Croatian Ecological Society. NGOs in Croatia are fighting to survive. Major grants from 1-2 international donors

are largely responsible for the recent growth of Green Action and ECCIB, and there are few prospects for the same level of funding from indigenous sources. Laws regarding NGOs and foundations are apparently weak and in need of reform if an effective, independent sector is to emerge in Croatia. For example, the law for NGOs does not provide tax exemption for donations to NGOs, although sport club associations do get this advantage.

C. Legislative Framework

C1. International Conventions

Compliance with these international agreements, signed or ratified, and in particular those relating to European accession, substantially influences the current objectives of the MoE.

The national laws discussed below are written to address requirements of the international agreements. To implement these international agreements and new laws, the MoE, other state and local governmental agencies, and the private sector all face substantial challenges. Implementation will be expensive and requires a long-term plan to train and deploy people with the required expertise. Senior officials in the MoE understand these challenges and the investment priorities of the NEAP and BSAP attempt to address the need.

Croatia has ratified or signed the major environmental agreements related to natural resources, including:

Convention on Biological Diversity (Rio) – Ratified
Convention on Wetlands on International Importance as Waterfowl Habitat (Ramsar) – Ratified
Convention on the Conservation of Migratory Species of Wild Animals (Bonn) – Ratified
Convention on the Conservation of European Wildlife and Natural Habitats (Bern) –Ratified
Convention Concerning the Protection of World Cultural and Natural Heritage (Paris) – Ratifed
Convention on International Trade in Endangered Species (CITES) – Ratified
Convention on the Conservation of Cetaceans (whales, dolphins and relatives) – Signed, not ratified
Two agreements to protect and manage trans-boundary watercourses
Convention on access to information, public participation in decision-making and access to justice in environmental matters (Aarhus) – Signed, not ratified

Croatia has also ratified or signed major international agreements regarding pollution, climate, hazardous materials, and environmental impact assessments.

C2. National laws

The MoE recently drafted two new laws relating to the environment. These are the law on nature protection and the law on the environment. New versions of these laws that are under review within the MoE will be combined with another new law regarding physical planning. The entire package will be presented as a single legislative initiative. Other ministries, institutes and the public still must comment these laws. The entire process may take another year or two.

The current law for nature protection is based on principles of sustainable exploitation while protecting the resource, preventing harmful interventions by humans, managing through short-term and long-term plans and the implementation of physical plans (i.e., land use plans). The new law will focus more on preservation and improvement of biological diversity, rational economical exploitation of natural resources on the principles of sustainability and for the benefit

of future generations, and incorporation of protection measures and sustainable exploitation into all relevant sectors, laws, plans and programs.

In the meantime, the MoE is using the current laws and is changing policy and operations to implement new programs required to meet the terms of international agreements. Some of the changes are substantial and look promising. For example, the "commissions" that provide oversight of EIAs have been reformed, with membership that is now substantially independent of the investors and the responsible government agency.

D. International Biodiversity Conservation Projects

The international community is investing very little toward biodiversity conservation in Croatia. The World Bank Forestry Project (see below) is the only large active international project focused on natural resources in Croatia, but not even that project has biodiversity as a primary objective. One large World Bank GEF project will likely begin next year to address the biodiversity issues of the karst region and another will support wetlands conservation in connection with a World Bank development. GEF Enabling Activities funds have supported preparation of the BSAP and the World Bank has helped fund preparation of the NEAP. A few small grants from bilateral agencies or international NGOs have supported local NGOs and biodiversity projects. There are many project proposals asking multilateral and bilateral agencies to support environment projects.

The Coastal Forest Reconstruction and Protection Project, initiated in 1997, is a US $60 million ($42M World Bank loan; $12M state funds) five-year program to restore and protect forest land in order to enhance landscape and recreation values of the region and thereby contribute to restoration of tourism to its pre-war level. The three components of the program are 1) rehabilitation of 5800 ha of forest, 2) forest fire management, and 3) institutional support to Croatian Forests and the Ministry of Interior. The largest component of the project is forest fire management.

The Karst Ecosystem Conservation Project is being prepared with a grant from the World Bank/GEF. Expected to start next year, the project objective is the conservation of biodiversity of the karst ecosystems of Croatia. The geographic scope of the project is being decided in the preparation phase.

Several other World Bank projects have environmental components. The World Bank/GEF wetlands project at Kapocki rit Nature Park will support management of wetlands for biodiversity objectives. The project is associated with a World Bank loan for reconstruction of infrastructure destroyed in the recent war. A World Bank mission in December 2000 will begin identification of a project to control municipal wastewater and solid waste in the coastal region.

Marifugia cavatica (on stalactites in water, Photo by Jalzic): The World Bank Karst Project proposes a broad range of measures to inventory and protect subterranean species like *Marifugia cavatica*, the only cave-dwelling tube-worm in Croatia.

The Croatian government has endorsed 21 proposals to the Stability Pact, Quick Start program. The proposals range from environmental information systems, policy initiatives related to international agreements, capacity building, and infrastructure for pollution abatement.

Croatia has endorsed the following proposals to the EU LIFE - third countries program:

- Forest fire management in the Eastern Adriatic region
- Upgrading of the national emissions inventory system and enforcement of its implementation
- Sustainable use of natural resources in Lonjsko polje Nature Park
- Rational water management in the Mediterranean/Adriatic area
- Differentiation of Croatian national maritime waters
- Strengthening Croatian capacity in environmental data gathering

The Dutch government supports a few biodiversity projects each year. The Dutch Embassy provides one small (US$8,000 – 10,000) grant each year to environment/natural resource project, usually through a local NGO. In recent years these grants went to project for recovery of rare butterfly populations and vegetation on sand dunes. The Dutch Ministry of Foreign Affairs supports biodiversity projects through the MATRA program. Green Action was one recent recipient, and Lonjsko Polje Nature Park received more than US $100,000 from the MATRA.

The Mediterranean Environmental Technical Assistance Program (METAP) has funded several environment plans and projects in recent years, including the Environmental Management Plan for the Cres-Losinj Archipelago.

SECTION V

Summary of Findings

SECTION V

Summary of Findings

1. Croatia is rich in biodiversity and harbors many endemic species. Highlights include many rare and endangered species among subterranean karst fauna, riverine fish in the karst region, and plants of the coastal mountains and islands. Intact forest ecosystems in the mountains of central Croatia support large mammals that are vanishing across Europe. To maintain viable populations these forest need to be managed as part of continuous forests in cooperation with forests in Slovenia and Bosnia. Wetlands of the Sava and Drava basins support many species of global and regional significance.

2. Information about biodiversity is poor and in many cases inadequate for supporting environmental planning and impact assessments. More information is most urgently needed about cave species and ecological / natural communities. Additionally, more capacity is needed to interpret biological information in the context of development and land-management decisions.

3. Major threats to biodiversity are water pollution from urban, agricultural and industrial sources; dams, reservoirs and diversion of rivers; draining wetlands for agriculture; habitat loss and fragmentation, particularly in the mountain forests; exotic species; and over harvest of wild natural resources. Of particular concern for the environment is the lack of coherent plans for growth and management of tourism and associated infrastructure on the Adriatic islands, coast and adjacent mountains. Expansion and modernization of agriculture in the karst region is another major threat to biological resources.

4. Protected areas are seldom managed for biodiversity conservation and most are neither protected nor managed at all. State forests are actively managed and have thus far maintained one of the most important forest ecosystems in all of Europe. However, protection of rare species habitat and other biodiversity features is not a priority in forestry plans.

5. An adequate legal and institutional framework is in place or being developed. However, the final form of the new laws on environment and nature protection will be critical to the future of biodiversity in Croatia. There is a need to address the authority and capacity of the Ministry of Environment and Physical Planning to influence and monitor management of individual national parks and nature parks. There is no clear line of management authority and accountability that requires on-the-ground managers in parks or state forests to comply with policy established by the ministries. Furthermore, greater capacity is needed for the MoE to monitor and enforce environmental laws.

6. Poor communication and cooperation among government institutions impedes biodiversity conservation programs. Improved coordination among MoE, Ministry of Agriculture and Forestry, Croatian Forests and Croatian Water would go a long way to

improve conservation and management of biodiversity in Croatia. Where inter-agency conflicts have been effectively resolved at the ground level (e.g., Lonjsko Polje Nature Park), conservation and sustainable development programs are progressing with considerable success.

7. Human and institutional capacity to implement the ambitious plans described in the NEAP and BSAP will require a long-term approach to training people with the appropriate skills. This new capacity is needed in the private sector as well as the public agencies. Biodiversity planning, management and monitoring in Croatia would benefit from participation of more stakeholders, including participation of private sector businesses and environmental NGOs, which all require more expertise to address biodiversity issues.

8. Bilateral and multilateral organizations are expected to invest significant resources in the environment sector in Croatia in the next five years. For each program to have maximum benefit, it is essential that the donors coordinate with each other, and ensure that adequate support reaches all stakeholders, including the private sector. Physical planning at the county and local level, including the equivalent of local BSAPs, is essential for coordination of actions. In addition, a regional plan that addresses accumulative impacts of international donor projects is needed for the entire coastline, islands and Adriatic Sea.

9. Biodiversity can play an important role in economic development in Croatia, if the resource is conserved. The Adriatic Sea has long been recognized for its tourist potential and as an important fishery. More recently, forests have been identified for their tourist value as well as the traditional value as a source of timber. Traditional practices and new approaches to sustainable use of natural resources can create new business opportunities and employment. Improved infrastructure, such as trails and interpretive kiosks, can increase tourism to remote areas. With good information and planning, management of biological resources can support multiple uses and reasonable growth, and still maintain biological diversity, including the less appreciated and more vulnerable subterranean species.

SECTION VI

Recommendations for Improved Biodiversity Conservation

SECTION VI

Recommendations for Improved Biodiversity Conservation

These recommendations are presented for the consideration of the Croatian government. They closely parallel recommendations of the BSAP and NEAP, and focus on those issues most closely related to the strategic activities of USAID. More detailed recommendations linked to the USAID program are included in Section VII.

1. Establish a permanently staffed national biodiversity inventory and monitoring program and incorporate the resulting information into the physical planning process and EIA at the national and local levels. Implementation of this might include the following activities:
    - Conduct additional inventories of rare and threatened species and, in particular, identify and inventory rare and threatened ecosystems.
    - Conduct more research into the species biology and ecology functions that must be understood in order to protect and manage rare and threatened species and ecological processes.
    - Collect and organize information on traditional practices regarding use of natural resources.
    - Establish a program to monitor the status of biodiversity in parks, other reserves and state forests.
    - Make biodiversity information available to counties and municipalities and to the public and provide assistance for these stakeholders to understand and interpret the information in the context of local decisions.

2. Train more biologists in the basic natural sciences, particularly in skills required to identify species in the field, to describe ecological conditions, and to evaluate biodiversity in the context of land use plans, development projects, and management plans.

3. Build at the county and municipal levels the capacity to incorporate biodiversity information in the physical planning process, the process for considering construction permits, and the EIA process. Specifically ensure that adequate information about rare and endangered biological resources are incorporated into plans and appropriately addressed in the decision-making processes. Evaluate the combined potential impacts of physical plans from multiple jurisdictions on ecosystems. For example, the impacts of local development related to tourism on the Adriatic Sea must be assess as the combined impacts of scores of municipalities in many counties, including those anywhere in the watershed. The impacts of municipal solid waste and wastewater can be addressed through this process.

4. Fully integrate biodiversity across other sectors through collaboration with other ministries, parastatal institutions and local governments. For example, work with Croatian Forests to better incorporate biodiversity considerations into forest plans, and

with Croatian Waters to evaluate biodiversity impacts of existing dams and other water projects and to reduce the impacts of these and future water projects.

5. Establish biodiversity protection and management objectives for each protected area and for the state forests. Establish a clear process whereby park managers, commissions, county governments, forest district managers and other responsible authorities are held accountable for implementing national environmental policies and for meeting specific biodiversity protection objectives. Identify best practices, including inter-agency collaboration and all-stakeholder participation, and promulgate these practices among park managers, district foresters, county planners, NGOs, and others involved with local level decision-making regarding the environmental management.

6. Strengthen the legal, administrative, inspection and enforcement components of MoE. Give MoE authority to require both cooperation and compliance from other government agencies and parastatal institutions (i.e., Croatian Forests and Croatian Waters). Provide legal protection for endangered species that applies the full extent of the law and penalties to motivate protection.

7. Build a strong NGO sector, capable of providing independent oversight of the development of physical plans, protected area plans and state forest plans. NGOs might also participate in implementation of conservation programs, though these should not be the same NGOs that provide independent oversight of these programs. Development of park management plans, and related forest plans, must be a transparent process and the monitoring data made available to the public. NGOs can play an essential role in helping to educate the public regarding how these plans influence their communities, including business and employment opportunities. The laws governing NGOs need to be revised to improve accountability, motivation for volunteerism, and the climate for local, private fundraising.

8. Evaluate potential new business and employment opportunities related to biodiversity protection and management. The lack of management and tourist infrastructure in protected areas, particularly in coastal and forested mountain areas, provides several opportunities worth exploring. Parks and other reserves have untapped tourist potential and selected biological resources might have value in niche markets

SECTION VII

USAID/Croatia

SECTION VII

USAID/Croatia

A. Impact of USAID Program on Biodiversity

USAID's overarching goal for Croatia in the period 2001 – 2005 is the development of a fully democratic society and productive market economy that together serve as a cornerstone for prosperity and stability in the region. This goal is to be achieved through the following three primary strategies with issues and opportunities related to biodiversity:

1. Growth of a Dynamic and Competitive Private Sector is the first and (in resource terms) most significant strategic priority in the Mission's portfolio. Its focus will be on promoting private sector enterprise development, particularly small and medium enterprises (SMEs).

2. More effective governance with increased and better-informed citizen participation will focus most of its resources on development of good local government capacity, and many public functions and authorities being devolved to the local level. Development of strong civil society is central to this objective.

3. Accelerated return and sustainable reintegration of displaced populations is an objective that can be measured by easily quantifiable results. This strategy stresses a comprehensive community-based approach that will bring a critical mass of assistance with infrastructure reconstruction, economic revitalization efforts, community-building and legal aid in communities that welcome and contribute toward the return of minority citizens to their towns and their homes. The strategy also seeks to increase use of market mechanisms and economic incentives to support the return and reintegration process.

The environmental impacts of these programs are neutral in some cases, positive in others and could be negative in a few cases. Support to building NGO capacity is certainly a positive influence on biodiversity conservation. NGOs like Green Action have influenced the government to be more transparent and accountable to the public. The NGO Eco-centre Caput Inulae has directly protected endangered species and involved the local community in eco-tourism and environmental education. Improved governance is neutral or positive regarding the environment, particularly where better transparency and public participation are concerned.

There is considerable evidence that during and following the war the environment somewhat recovered from previous years of mismanagement. If the reconstruction policy is to replace what was once there, we might only repeat the poor performance of the past. For example, replacement construction of housing should reconsider the adequacy of wastewater treatment and the capacity and placement of landfills with regards to biological resources. These considerations are particularly important in the extensive war affected areas in the karst region where USAID is active. Similarly, reclaiming farmland that was once wetlands should be carefully evaluated, since there is ample evidence that early decisions to drain these wetlands

were probably made without adequate consideration of the potential negative impacts to biological diversity.

New businesses enterprises should not rely solely on current Croatian programs to screen construction permits, perform EIA, inspect and monitor projects with the intent of protecting biological diversity. Municipal and county physical plans are often inadequate to guide the permit process. It is not just the land-based activities such as agriculture and forestry that are of concern. Programs that promote tourism must consider indirect influences such as increasing burden on water systems, increasing pollution of the karst systems and the Adriatic Sea, and direct negative impacts of activities such as cave tours and their effects on sensitive cave fauna.

B. Recommendations for USAID/ Croatia

Under the SME Strategy:

1. Support the creation and development of private environmental consulting firms to assist with physical plans being prepared by the counties and municipalities, prepare management plans for protected areas and state forests, participate in EIA, and conduct independent monitoring of the environment. Emerging or new firms could be provided training in contract bid preparation, contract management, technical assistance, and contracts. U.S. consulting firms could provide some of training and TA in the context of accomplishing work for USAID.

2. Support and develop NGOs that can be contracted to manage protected areas. Many areas important for biodiversity conservation are entirely without protection or management of any sort – the proverbial "paper parks." And some of these sites are of extraordinary value as tourist attractions, for their esthetic and scenic values, ancient history, and outdoor leisure and sporting potential (e.g., hiking, swimming, fishing, diving). Entrance fees and concession revenues could be used to support park rangers, interpretive/educational programs, research, infrastructure building and maintenance. Municipal and county governments should contribute funds annually to general operating budgets of the parks in their jurisdiction, in recognition that the parks provide employment, bring and retain tourists to the region. (Note that this same approach with for-profit basis runs the risk that the parks will be managed for whatever pays the most, and not primarily for protecting biodiversity conservation, appreciation and education.)

3. Encourage businesses to adopted and implement environmentally sound policies and to use technologies that minimize pollution. For example, industries should be encouraged to comply with ISO 9000 and ISO 14000 environmental management standards. Cleaner industry means less pollution to impact the environment.

4. Consider developing businesses for improved harvesting and marketing of wild native species and possible cultivation of these species. Mushrooms, herbs and flower bulbs are collected from the wild, sold locally and exported. There is little information about what is harvested, where or how much. Some of these wild resources could be more efficiently exploited, while others are threatened with extinction due to irrational and inappropriate harvest techniques. However, they might provide a sustainable harvest if

better managed, or they could be cultivated and thus provide even greater employment and revenue.

Under effective local government and citizen participation:

5. Continue to support NGOs that are effective in educating the public about environmental issues impacting them and in bringing citizen participation to decision-making regarding environmental issues. Support public participation in the preparation of the environmental component of physical plans in selected counties and municipalities.

Under the Returnees Strategy:

6. Explore opportunities to reduce pollution from wastewater, urban, industrial and agricultural sources that are negatively impacting biodiversity in the areas where USAID is actively involved, particularly in the karst region.

7. Increase employment opportunities through a program based on the concept of the Civilian Conservation Corps. There is a need to construct trails, interpretive centers, anchorages and shelters for tourists, and housing for park managers. In war-effected areas provide people with jobs that support conservation projects. Combine these jobs with skills training, for example in construction.

8. From the local populations, train and employ para-biologists (people without university training, but an interest to learn about nature and an aptitude to work as field biologists) to inventory and monitor endangered species and ecosystems, assist with tour guides and interpretive/educational programs. Experience has shown that women do at least as well as men in this sort of work. Once these teams gain some experience with record keeping, task them with cataloguing the local knowledge and lore of the species uses and management practices, being certain to record information from various ethnic groups and both genders. This experience can build local self-esteem (they know things that the scientists don't know), and local appreciation for the resources around them. It also provides new information for interpretive programs of interest to tourists, and can develop into leads to develop new products from local resources.

9. Maintain and encourage traditional agricultural practices where these are important for biodiversity. For example, returnees could be encouraged to graze specific areas to maintain meadows in natural vegetation and to reduce the fuel load that has contributed to forest fires in recent years. Ancient breeds of domestic animals and plants should be considered over new hybrids when there are not overwhelming advantages to the hybrids.

10. Prepare catalogues and maps of biologically sensitive features, including endangered species, and vulnerable and fragile ecosystems. A catalogue of biologically sensitive features is an important component of the county and municipal physical plans. By ensuring that these features are identified and included in the plans, there is a greater likelihood that future development activities can avoid destroying important biological sites. USAID, in cooperation with the local government agencies, can demonstrate how these catalogues, plans, and the permitting process can be used to strengthen decision-

making. Government agencies and the private sector can use the information for EIA, water management, forest management, etc.

ANNEX A

Sections 117 and 119 of the Foreign Assistance Act

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

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

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

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

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

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

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

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

Sec. 118.[71] Tropical Forests.

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

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

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

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

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

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

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

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

[69] 22 U.S.C. 2151p. Sec. 117 was redesignated from being sec. 116 by sec. 301(1) of Public Law 99–529, resulting in the creation of two sections 117. Sec. 301(2) of Public Law 99–529 (100 Stat. 3014) further deleted subsec. (d) of that section, which dealt with tropical forests, and then sec. 301(3) of Public Law 99–529 added a new section 116 entitled "Tropical Forests". This section, as added by sec. 113 of Public Law 95–88 (91 Stat. 537) and amended by sec. 110 of Public Law 95–424 (92 Stat. 948) and sec. 122 of Public Law 96–53 (93 Stat. 948), was further amended and restated by sec. 307 of the International Security and Development Cooperation Act of 1981 (Public Law 97–113; 95 Stat. 1533). This section previously read as follows:

"Sec. 116. Environment and Natural Resources.—(a) The President is authorized to furnish assistance under this part for developing and strengthening the capacity of less developed countries to protect and manage their environment and natural resources. Special efforts shall be made to maintain and where possible restore the land, vegetation, water, wildlife and other resources upon which depend economic growth and human well-being especially that of the poor.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(9) To the fullest extent feasible, support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation, including research in agroforestry, sustainable management of natural forests, small-scale farms and gardens, small-scale animal husbandry, wider application of adopted traditional practices, and suitable crops and crop combinations.

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

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

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

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

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

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

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

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

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

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

(14) Deny assistance under this chapter for—

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

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

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

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

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

(C) The colonization of forest lands.

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

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

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

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

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

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

Sec. 119.[72] Renewable and Unconventional Energy Technologies. * * * [Repealed—1980]

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

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

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

[73] 22 U.S.C. 2151q.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ANNEX B

Scope of Work

ANNEX B

Scope of Work

Scope of Work
Biodiversity Assessment: Croatia

I. Objective:

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

II. Background:

A. Policies governing Environmental Procedures

USAID environmental compliance is directed by US policy and law. The Foreign Assistance Act (FAA) of 1961, Section 117, requires that the President take fully into account the impact of foreign assistance programs and projects on environment and natural resources (Sec 117 (c)(1)). Current USAID Legislation which guides environmental impact and monitoring is Title 22 of the Code of Federal Regulations, Part 216 ("Reg. 216"). In complying with the law, USAID provides its Environmental Procedures under ADS 204.5 to ensure accordance with the requirements of Title 22 CFR 216.

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

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

B. USAID's Program in Croatia

I. Introduction

USAID's assistance to Croatia began in fiscal year 1993, and was initially focused on providing relief for victims of war. After signing of the Dayton Peace Accords, the first USAID assistance strategy for Croatia was prepared, covering the planning period from FY 1996 through FY 2000. The program focused on three objectives: the return and reintegration of war-affected populations; a more competitive market-responsive private financial sector; and increased, better-informed citizen participation in political processes. These

objectives, in particular reintegration, supported the primary U.S foreign policy objectives for Croatia, most importantly implementation of the Dayton Agreement (December 1995) and the Basic Agreement on the Region of Eastern Slavonia, Baranja, and Sirmium, signed in Erdut in November 1995. The Government of Croatia (GOC) is a pivotal partner in bringing peace and stability to the Balkans.

Elections in January 2000 cast a spotlight on USAID/Croatia's achievements in the democracy sector, but the drama of elections was preceded by years of steady effort. Since 1993, USAID has played a leading role in developing and supporting civil society organizations that might otherwise have withered in the face of government harassment. Citizen participation in electoral processes was increased through direct technical assistance to NGOs, trade unions, and political parties. In addition, USAID developed in-country training capacity to expand the capabilities of smaller local NGOs. These efforts reached dramatic culmination in the coordinated pre-election efforts of 140 NGOs and trade unions. Environmental NGOs have been leaders in the development of civil society in Croatia, and have received USAID assistance. At the same time USAID played the lead role in strengthening independent radio, print media, and professional media associations, despite a hostile environment in which independent media were subject to severe harassment by the government.

Since January 2000, dramatic political changes have significantly improved the climate for sustained economic and democratic reform. President Franjo Tudjman, who led Croatia since independence from Yugoslavia, died in December 1999. In the parliamentary elections that followed in January 2000, pro-reform opposition parties gained a majority of seats. In February 2000, a new president, Stipe Mesic, was elected, and the Mesic government has committed to broad economic and political reform. If Croatia continues to make effective and expeditious reforms, it may become a stronger partner in bringing lasting peace and stability to the region. Rapid reform would also create the possibility of Croatia's graduation from bilateral US economic assistance near the end of the five-year planning period.

USAID is currently in the process of finalizing a new strategic plan which will guide its program through 2005. USAID/Croatia is operating under three strategic objectives: SO 1.3: Accelerated development and growth of private enterprises, including energy and environment; SO 2.1: Increased, better-informed citizens' participation in political processes, and 3.1: Reintegration of war-affected populations.

III. Statement of Work

The Contractor shall perform the following activities:

A) Pre-travel informational meetings and information gathering: Prior to travelling to the field, the contractor is expected to:

1. Hold meetings with the Bureau Environmental Officer (BEO) of USAID's E&E Bureau in Washington, to ensure full understanding of USAID Environmental Procedures, the role of the Regional Bureau in environmental compliance, 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.

2. Gather existing, relevant background information on Croatia's natural resources base and begin identifying organizations and donors involved in the sector.
3. Meet or speak with key stakeholders or managers at the World Bank, NGOs or other organizations involved in biodiversity conservation in Croatia or relevant regional efforts in the CEE. Of particular importance will be gaining familiarity with the World Bank's assistance to Croatia in developing a National Environmental Action Plan (NEAP).

B) Field a team to conduct an overview and general analysis of each country's biodiversity and its current status. Upon arriving in Croatia, the team will:

1. Meet with USAID/Croatia to get a solid understanding of Mission program goals and objectives under its new strategy; perspectives of this assignment and specific interests for the team, including advice and protocol on approaching USAID partners and host country organizations with respect to this assignment. The team shall be aware of sensitivities related to an assessment exercise (i.e. the potential for raising expectations, and the need to be clear as to the purpose of the assessment) and respect Mission guidance. The team will discuss organizations to be contacted and any planned site visits with the Mission and coordinate as required.
2. Hold meetings with donor organizations, NGOs, relevant go agencies, and other organizations who are knowledgeable about biodiversity conservation or implementing noteworthy projects, and gather information locally.
3. If necessary, conduct one or two-priority site visits that would help supplement understanding of interviews and literature.

C) Prepare a report on the status of biodiversity and conservation efforts in Croatia and implications for USAID or other donor programming and environmental monitoring which shall define the actions necessary for conservation. The report shall 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 forests, wetlands, 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.
- recent, current and potential future primary threats to biodiversity whether they are ecological (i.e. fire, pests) , related to human use (i.e. agriculture, contamination), or institutional (i.e. failed policy) or transboundary issues as appropriate. This should include a general assessment of 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 and monitoring systems.

- a specific sub-section devoted to the damage by forest fires during the summer of 2000. With respect to Biodiversity, the recent of destruction to the Tstano arboretum by the summer fires should be noted with respect to ex-situ conservation implications. In addition a general assessment of the extent of damage, its impact on natural resources and whether its causes and the institutional responses to fire deserve further attention should be determined.
- conservation efforts including their scope and effectiveness. This section should also include recent, current and planned activities by donor organizations which support biodiversity conservation, an identification of NGO's, universitiés 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 goals and objectives. Particular attention should be paid to ecotourism opportunities, especially in coastal areas.

D) Prepare a one to two page summary or overview on the status of biodiversity and conservation efforts in Croatia and implications for USAID or other donor programming and environmental monitoring which shall define the actions necessary for conservation. The summary will be based on the assessment conclusions. This overview will be included in the bio-diversity section of the USAID/Croatia Strategy.

IV. Methodology:

The contractor shall field a two-person team for this assignment. One team member should be a biodiversity (terrestrial or coastal) specialist or practitioner 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 an Expatriate senior-level professional with USAID experience and significant experience in international conservation programs and environmental impact assessments. Experience in the region or country is preferred. The second team member shall be a qualified Cooperating Country National (CCN) natural resources or biodiversity professional.

V. Deliverables:

The first deliverable under this task order is a report addressing the points specified in the statement of work, not to exceed 30 pages, excluding annexes. The 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. A draft report is due to USAID/Croatia for comment no later than December 10, 2000. The final report is due in Croatia no later than December 31, 2000. Two hard copies and one electronic copy in Word format of this assessment shall be provided to the USAID/Croatia Mission control officer as well as to the EE Bureau Environmental Officer.

The second deliverable is a one-two page "Overview" of the sector based on assessment conclusions. This Overview will be included in the biodiversity section of the USAID/Croatia strategy. This Overview is due no later than November 30, 2000.

The third deliverable is an in-country Mission exit briefing.

VI. Reporting Requirements:

The Contractor shall report to the Mission Environmental Officer or his/her designee in Croatia for this overall assignment, and copy Alicia Grimes, Forestry and Biodiversity Advisor, EE/EEST/ENR on all correspondence and deliverables.

VI. Anticipated Level of Effort (LOE) and Schedule:

The LOE for this assignment is a total of 47 person-days for a two-person team as follows:

- Information gathering and meetings in Washington with USAID BEO, World Bank, NGOs and others as relevant. (Team Leader: 3 person-days)
- Field Assessment, analysis and Mission debriefing (34 person-days, including travel)
- Report Preparation (including incorporating USAID comments (10 person-days)

Schedule: Work under this task order shall begin immediately after its signing. Upon signing this task order, the contractor shall coordinate with the Task Order CTO in Croatia to establish a window for the field assessment with the USAID Missions. A final schedule shall be developed for this task order and delivered to the CTO as soon as possible after the signing of this task order.

Logistics:

The Contractor will coordinate logistics with each Mission Environmental officer or its designated Control Officer in each country. Each Mission will assist the contractor by providing key references, documents and contacts available in country as well as advise on local transportation and interpretation services, and protocol in interacting with host country institutions and partners.

ANNEX C

List of Contacts

ANNEX C

List of Contacts

1. John W. Fraser Stewart, Sr. Biodiversity and Natural Resources Specialist, Europe and Central Asia Region, The World Bank, Washington D.C.

2. Charis Wuerffel, Team Leader, Coastal Forest Reconstruction and Protection Project, The World Bank, Washington D.C.

3. Chuck Howell, Program Officer, USAID, Zagreb

4. Alicia Grimes, Forestry and Biodiversity Advisor, USAID, Washington

5. Keith Sherper, Sr. Advisor, USAID Mission Croatia, Zagreb.

6. Mr. Brad Davis and Mr. Lee G. Warren, FLAG, Osijek

7. Jojek Fastner, Head of Economic/Trade Department & Environmetal Issues, Royal Netherlands Embassy, Zagreb

8. Željko Rendulic, Assistant Minister, Ministry of Agriculture and Forestry

9. Jasminka Radovic, B.Sc. (Biology), Head of Department for Biological and landscape Diversity Conservation Department, Ministry of Environmental Protection and Physical Planning, Zagreb

10. Hrvoje Glavac, Assistant Minister, Ministry of Environmental Protection and Physical Planning, Zagreb

11. Zrinka Marusic, Institute for Tourism, Zagreb

12. Tajana Huzak, Head of Department for Island's Development Programs, Ministry of Public Works, Development and Building, Zagreb

13. Tea Perincic, Executive Director – NGO Eco-centre *Caput Insulae*-Beli (ECCIB), Island of Cres

14. Nadia Cuculic, Head of Volunteers Center (within the above mentioned NGO)

15. Gordana Pavokovic, Head of Ecotourism (within the above mentioned NGO)

16. Vlatko Superina, Vice-director of the Regional Planning and Environmental Protection Department, Primorsko-Goranska County, Rijeka

17. Želimir Grzancic, Head of the Environmental Protection Section, Regional Planning and Environmental Protection Department, Primorsko-Goranska County, Rijeka

18. Margita Mastrovic, Senior Adviser, Marine and Coastal Protection Unit, Ministry of Environmental Protection and Physical Planning, Rijeka

19. Sandra Troselj, Staff Associate, Marine and Coastal Protection Unit, Ministry of Environmental Protection and Physical Planning, Rijeka

20. Slavko Perica, Ph.D. Director of the Institute for Adriatic Crops and Karst Reclamation, Split

21. Ivan Katavic, Ph.D. Senior scientist, Institute of Oceanography and Fisheries, Split

22. Ivica Trumbic, Director, Regional Activity Center for the Priority Actions Programme (RAC/PAP), Mediterranean Action Plan, UNEP, Split

23. Jagoda Munic, NGO Green Action, Zagreb

24. Toni Nikolic, Ph.D. Department of Botany, Faculty of Science, University of Zagreb, Zagreb

25. Prof. Milorad Mrakovcic, Ph.D. University professor, Department of Zoology, Faculty of Science, University of Zagreb, Zagreb

26. Sanja Gottstein-Matocec, NGO Hrvatsko Biospeleološko Društvo (Croatian Biospeleological Society), Zagreb

27. Juraj Posaric, B.Sc. (chem.), Head of Department-Senior inspector, Ministry of Environmental Protection and Physical Planning, Zagreb

28. Matija Frankovic, Ph.D. Assistant Minister, Head of Department of Environmental Protection, Ministry of Environmental Protection and Physical Planning, Zagreb

29. Ivan Martinic, Ph.D. Assistant Minister, Head of Department of Nature Protection, Ministry of Environmental Protection and Physical Planning, Zagreb

30. Jela Bilandzija, Project Coordinator, Coastal Fores Reconstruction and Protection Project, Ministry of Agriculture and Forestry, Zagreb

31. Radenko Dezelic, B.Sc. (biology) Head of Department for Natural Heritage Conservation, Ministry of Environmental Protection and Physical Planning, Zagreb

32. Stella Satalic, M.Sc. Head of Department for Sustainable Use of Natural Resources, Ministry of Environmental Protection and Physical Planning, Zagreb

33. Kornelia Pintaric, Head of Department – Division of General Environmental Policy, Sectoral Analysis and Strategic Planning Department, Ministry of Environmental Protection and Physical Planning, Zagreb

34. Maurice Cronley, director, Academy for Educational Development (AED), Zagreb

35. Lidija Pavic, Deputy Director, Academy for Educational Development (AED), Zagreb

36. Hrvoje Caric, Assistant – Program manager, Academy for Educational Development (AED), Zagreb

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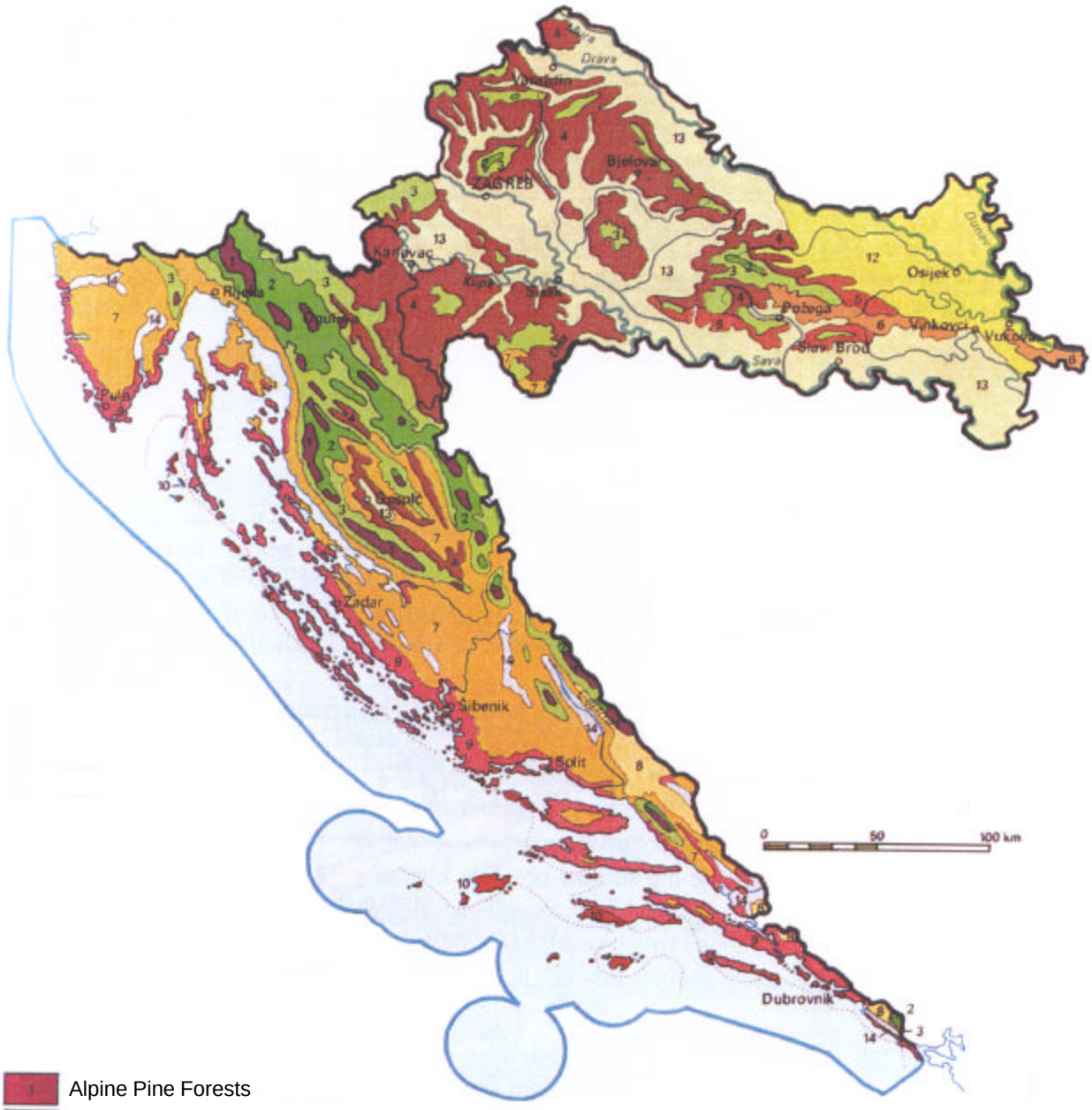
ANNEX D

Map of Major Vegetation Types in Croatia

Map 1: Major Vegetation Types in Croatia



1 Alpine Pine Forests
2 Continental Forests of Common Beech and European Silver Fir
3 Continental Beech Forests
4 Continental Oak Forests of Sessile Oak
5 Continental Oak Forests of Turkey Oak and Sessile Oak
6 Continental Oak Forests of Q. Confertae and Turkey Oak
7 Submediterranean Forests and Shrublands of Pubescent Oak and Hornbeam
8 Submediterranean Forests and Shrublands of Pubescent Oak and Hornbeam
9 Mediterranean Forests of Holm Oak
10 Mediterranean Forests of Holm Oak
11 Mediterranean Forests of Holm Oak
12 Lowland Meadows, Fields and Plough-land
13 Lowland Meadows, Fields and Plough-land
14 Lowland Meadows, Fields and Plough-land

ANNEX E

List of Endangered Species for Croatia

ANNEX E

List of Endangered Species for Croatia:
Courtesy of Red Data List for Croatia (www.redlist.org)

Amphibians

Scientific Name	Common Name(s)	Red List
Bombina bombina	European Fire-bellied Toad	Lower risk
Hyla arborea	European Tree Frog	Lower risk
Proteus anguinus	Cave Salamander, Olm	Vulnerable
Rana latastei	Italian Agile Frog	Lower risk

Birds

Scientific Name	Common Name(s)	Red List	Trend
Acrocephalus paludicola	Aquatic Warbler	Vulnerable	Decreasing
Anser erythropus	Lesser White-fronted Goose	Vulnerable	Decreasing
Aquila clanga	Spotted Eagle	Vulnerable	Decreasing
Aquila heliaca	Imperial Eagle	Vulnerable	Decreasing
Aythya nyroca	Ferruginous Duck	Lower risk	
Circus macrourus	Pallid Harrier	Lower risk	
Crex crex	Corncrake	Vulnerable	Decreasing
Falco naumanni	Lesser Kestrel	Vulnerable	Decreasing
Gallinago media	Great Snipe	Lower risk	
Haliaeetus albicilla	White-tailed Eagle	Lower risk	
Numenius tenuirostris	Slender-billed Curlew	Critically endangered	Decreasing
Otis tarda	Great Bustard	Vulnerable	Decreasing
Pelecanus crispus	Dalmatian Pelican	Lower risk	
Phalacrocorax pygmeus	Pygmy Cormorant	Lower risk	
Tetrax tetrax	Little Bustard	Lower risk	

Fish

Scientific Name	Common Name(s)	Red List
Acipenser naccarii	Adriatic Sturgeon	Vulnerable
Acipenser sturio	Common Sturgeon	Critically endangered
Alburnus albidus	Italian Bleak	Vulnerable
Alosa fallax	Twaite Shad	Data deficient
Alosa pontica		Data deficient
Aphanius fasciatus	South European Toothcarp	Data deficient
Atherina boyeri		Data deficient
Aulopyge huegelii	Dalmatian Barbel-gudgeon	Vulnerable
Barbus plebejus	Italian Barbel	Lower risk
Carassius carassius (European subpopulation)	Crucian Carp	Lower risk
Chalcalburnus chalcoides	Danube Bleak	Data deficient
Chondrostoma knerii	Dalmation Nase	Data deficient
Chondrostoma phoxinus	Minnow-Nase	Data deficient

Cobitis elongata	Balkan Loach	Data deficient
Cyprinus carpio	Wild Common Carp	Data deficient
Cyprinus carpio (River Danube subpopulation)	Wild Common Carp	Critically endangered
Eudontomyzon danfordi	Carpathian Brook Lamprey	Lower risk
Gobio albipinnatus	White-finned Gudgeon	Data deficient
Gobio kessleri	Kessler's Gudgeon	Data deficient
Gobio uranoscopus	Danube Gudgeon	Data deficient
Gymnocephalus schraetzer	Striped Ruffe	Vulnerable
Hucho hucho	Danube Salmon	Endangered
Huso huso	Beluga Sturgeon	Endangered
Knipowitschia croatica		Vulnerable
Lethenteron zanandreai	Lombardy Brook Lamprey	Endangered
Leuciscus illyricus		Vulnerable
Leuciscus microlepis		Vulnerable
Leuciscus polylepis		Endangered
Leuciscus svallize		Vulnerable
Leuciscus turskyi		Extinct
Leuciscus ukliva		Critically endangered
Misgurnus fossilis	Weatherfish	Lower risk
Neogobius kessleri	Kessler's Goby	Data deficient
Padogobius martensii		Lower risk
Pelecus cultratus	Ziege	Data deficient
Phoxinellus adspersus		Data deficient
Phoxinellus alepidotus		Vulnerable
Phoxinellus croaticus		Vulnerable
Phoxinellus ghetaldii		Vulnerable
Phoxinellus metohiensis		Vulnerable
Phoxinellus pstrossii		Data deficient
Pomatoschistus canestrinii	Canestrini's Goby	Data deficient
Sabanejewia aurata	Goldside Loach	Data deficient
Salmo dentex		Data deficient
Salmo marmoratus		Data deficient
Salmo thymus	Adriatic Salmon	Endangered
Stizostedion volgensis	Volga Zander	Data deficient
Syngnathus abaster		Data deficient
Umbra krameri	European Mud-minnow	Vulnerable
Zingel streber	Streber	Vulnerable
Zingel zingel	Zingel	Vulnerable
Zosterisessor ophiocephalus		Data deficient

Mammals

Scientific Name	Common Name(s)	Red List	Trend
Barbastella barbastellus	Western Barbastelle	Vulnerable	Decreasing
Castor fiber	Eurasian Beaver	Lower risk	Unknown
Chionomys nivalis	Snow Vole	Lower risk	Unknown
Dinaromys bogdanovi	Balkan Snow Vole	Lower risk	Unknown
Dryomys nitedula	Forest Dormouse	Lower risk	
Eliomys quercinus	Garden Dormouse	Vulnerable	
Glis glis	Fat Dormouse	Lower risk	
Lutra lutra	Eurasian Otter	Vulnerable	Unknown

Micromys minutus	Harvest Mouse	Lower risk	
Mus spicilegus	Steppe Mouse	Lower risk	
Muscardinus avellanarius	Common Dormouse	Lower risk	
Myotis bechsteini	Bechstein's Bat	Vulnerable	Decreasing
Myotis capaccinii	Long-fingered Bat	Vulnerable	Decreasing
Myotis emarginatus	Geoffroy's Bat	Vulnerable	Decreasing
Nyctalus lasiopterus	Giant Noctule	Lower risk	
Nyctalus leisleri	Lesser Noctule	Lower risk	
Rhinolophus euryale	Mediterranean Horseshoe Bat	Vulnerable	Increasing
Rhinolophus ferrumequinum	Greater Horseshoe Bat	Lower risk	
Rhinolophus hipposideros	Lesser Horseshoe Bat	Vulnerable	Decreasing
Rhinolophus mehelyi	Mehely's Horseshoe Bat	Vulnerable	Decreasing
Sciurus vulgaris	Red Squirrel	Lower risk	Unknown

Reptiles

Scientific Name	Common Name(s)	Red List
Aspius aspius	Asp	Data deficient
Emys orbicularis	European Pond Turtle	Lower risk
Testudo hermanni	Hermann's Tortoise	Lower risk
Vipera ursinii	Orsini's Viper	Endangered

Plants

Scientific Name	Red List
Campanula fenestrellata	Rare
Campanula portenschlagiana	Rare
Campanula poscharskyana	Rare
Degenia velebitica	Vulnerable
Genista holopetala	Vulnerable
Phyllitis hybrida	Rare

The categories

EXTINCT (EX) - A taxon is Extinct when there is no reasonable doubt that the last individual has died.

EXTINCT IN THE WILD (EW) - A taxon is Extinct in the wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR) - A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the criteria (A to E) as described below.

ENDANGERED (EN) - A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future, as defined by any of the criteria (A to E) as described below.

VULNERABLE (VU) - A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the criteria (A to E) as described below.

RARE (R)
Taxa with small world populations that are not at present Endangered or Vulnerable but are at risk. These taxa are usually localized within restricted geographic areas or habitats or are thinly scattered over a more extensive range.

LOWER RISK (LR) - A taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories:

Conservation Dependent (cd). Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.

Near Threatened (nt). Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.

Least Concern (lc). Taxa which do not qualify for Conservation Dependent or Near Threatened.

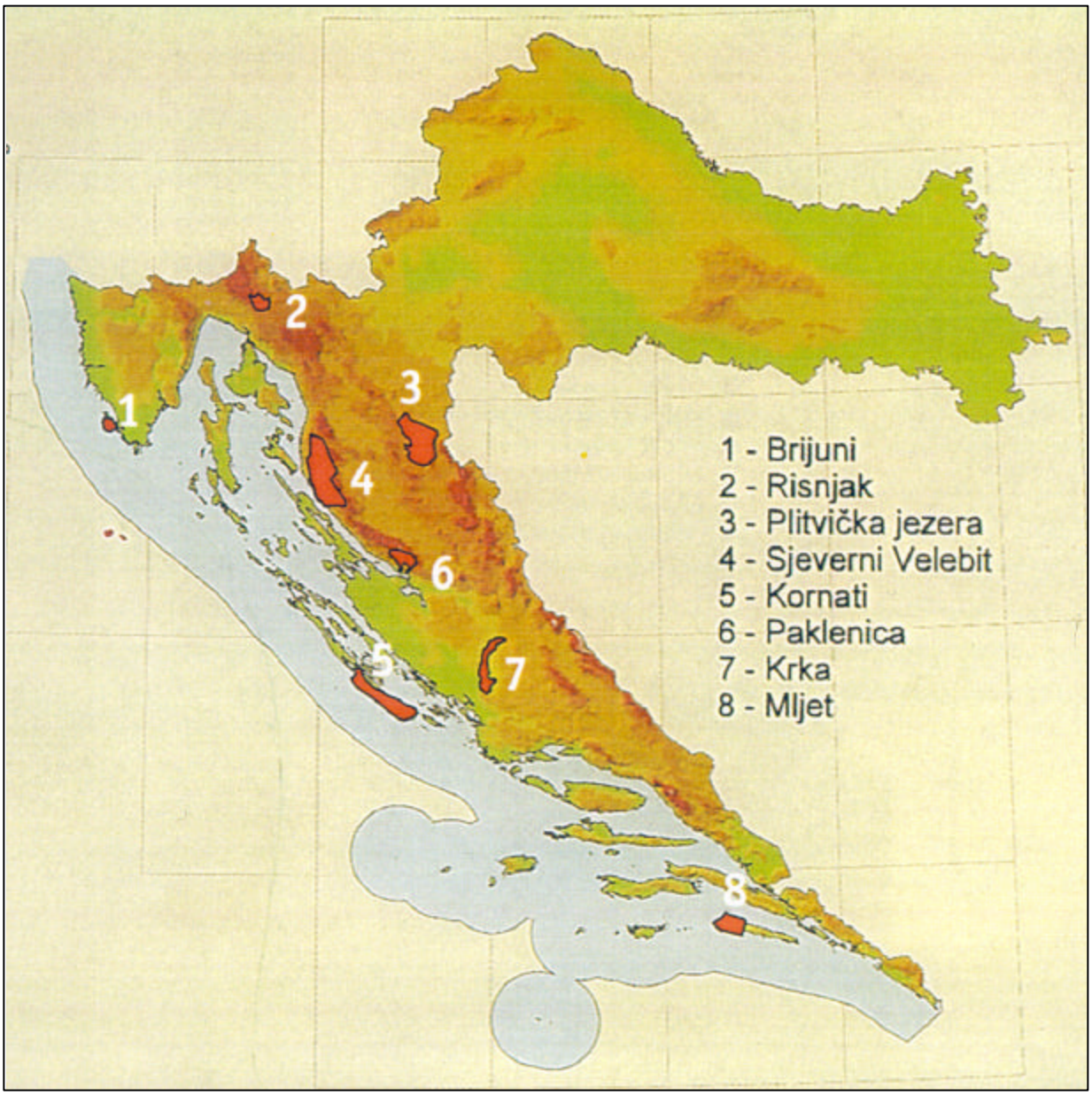
DATA DEFICIENT (DD) A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution is lacking. Data Deficient is therefore not a category of threat or Lower Risk. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and threatened status. If the range of a taxon is suspected to be relatively circumscribed, if a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

NOT EVALUATED (NE) A taxon is Not Evaluated when it is has not yet been assessed against the criteria.

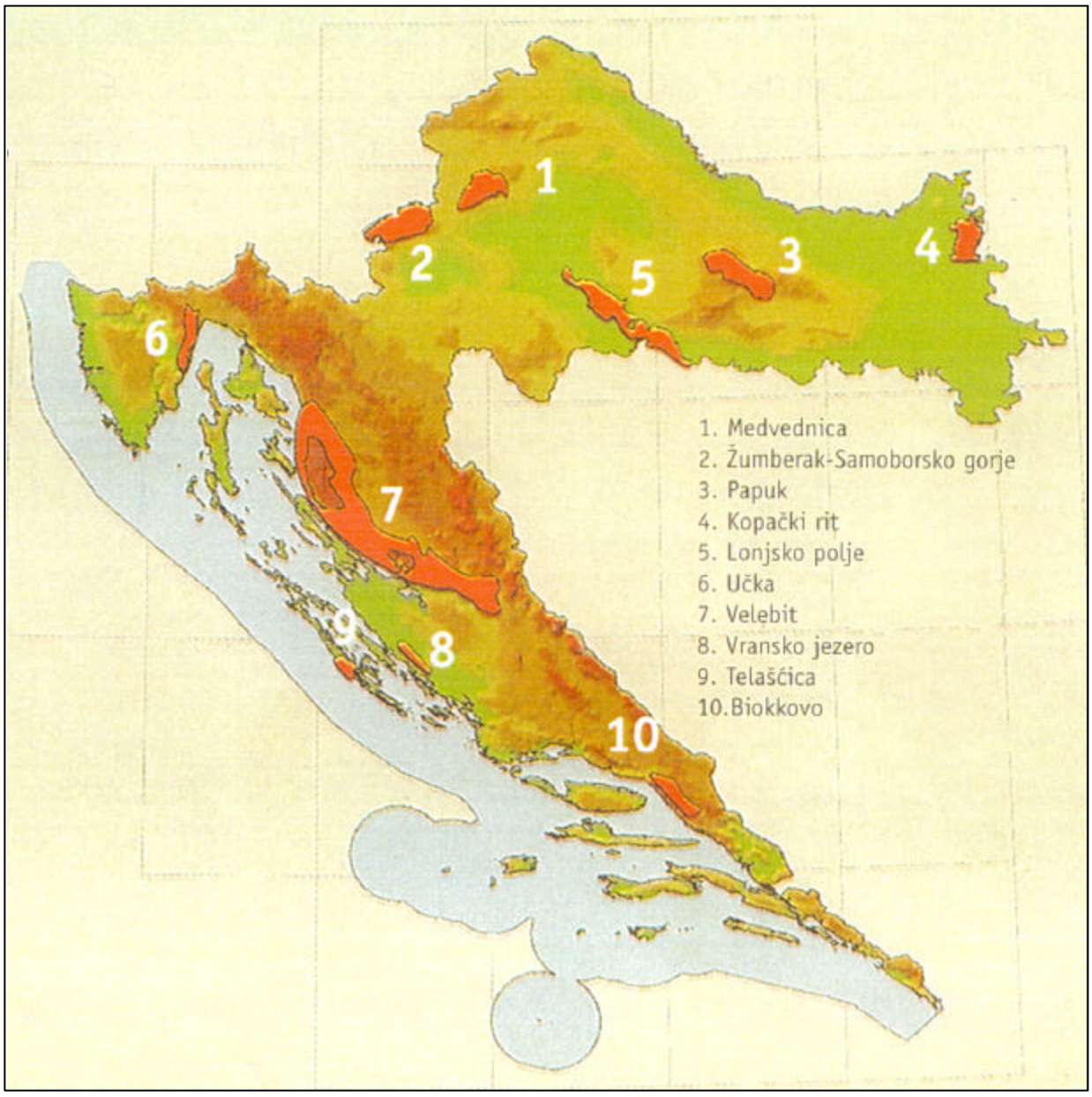
ANNEX F

Maps of Protected Areas in Croatia

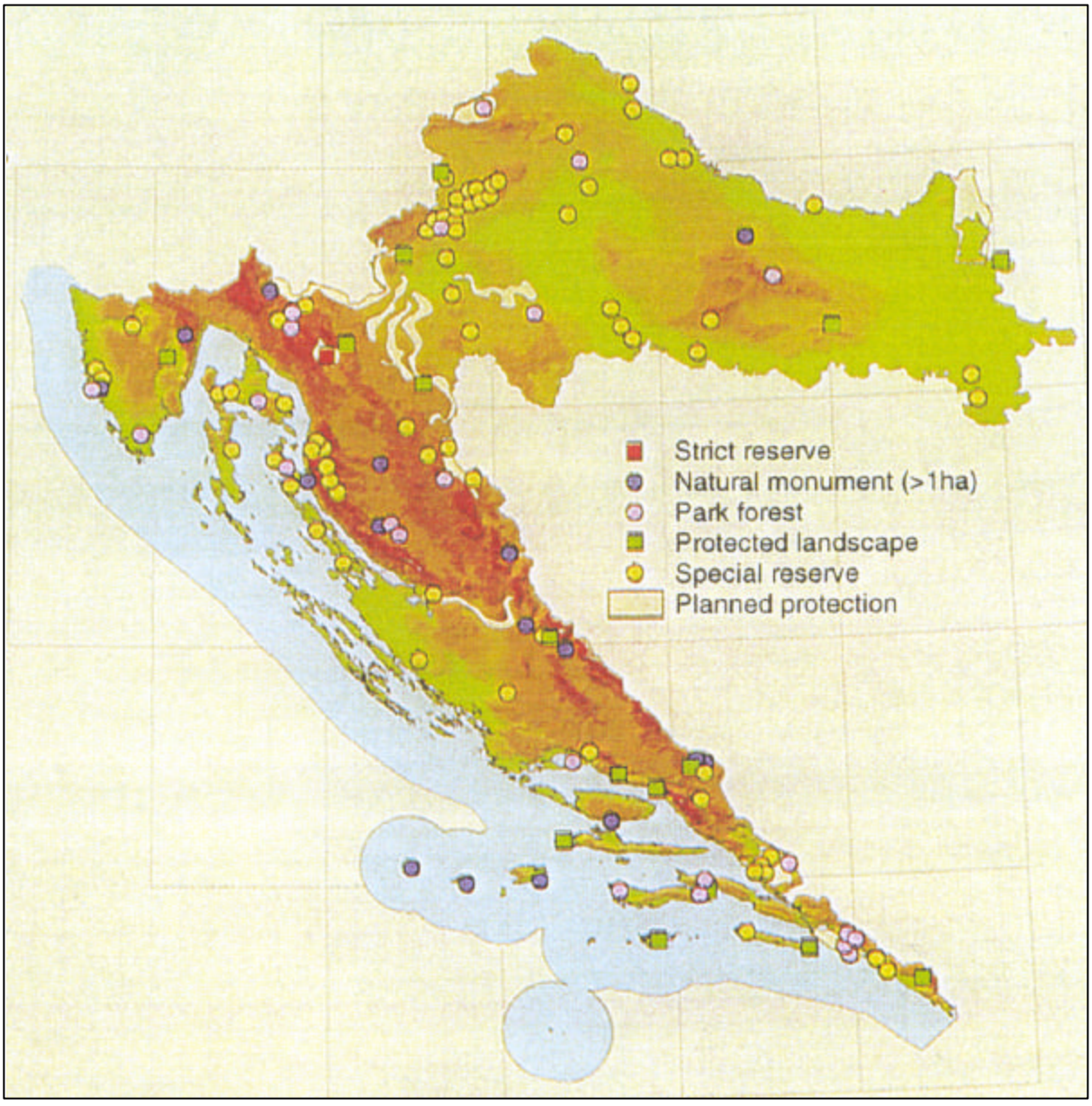
Map 2: National Parks of Croatia



Map 3: Nature Parks of Croatia



Map 4: Other Protected Areas in Croatia
(excluding National Parks and Nature Parks)



ANNEX G

Bibliography

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