Biodiversity Assessment: USAID/Honduras Report

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Maps

Directory of Acronyms

AFE-COHDEFOR	State Forestry Administration
BICA	Bay Island Conservation Association
MBC	Mesoamerican Biological Corridor
CCAD	Central American Comission on Environment and Development
CODEFAGOLF	Comité para la Conservación y Desarrollo del Golfo de Fonseca
COSUDE	Swiss Cooperation for Development
CUPROFOR	Centro de Utilización y Producción de Productos Forestales.
CURLA	Centro Universitario Regional del Litoral Atlántico
CITES	Convención sobre el Tráfico Internacional de Especies en Peligro de Extincción
DAPVS	Dirección de Areas Protegidas y Vida Silvestre
DIBIO	Dirección General de Biodiversidad
DIGEPESCA	Dirección General de Pesca y Acuicultura
EAP-Zamorano	Escuela Agrícola Panamericana at Zamorano Valley.
ESNACIFOR	Escuela Naciononal de Ciencias Forestales at Siguatepeque
FUCSA	Fundación Cuero y Salado
FUNAPIB	Fundación Nacional Parque Pico Bonito
FUCAGUA	Fundación Capiro y Calentura
FINNIDA	Finland Cooperation for Development
FAO	Food and Agriculture Organization
GTZ	German Agency for International Cooperation
IDB	Interamerican Bank of Development
IHT	Instituto Hondureño de Turismo
MOPAWI	Mosquitia Pawisa (La Mosquita Development)
ONGs	Organizaciones No Gubernamentales [ambientalistas o no]
PAs	Protected Areas
PAAR	Proyecto de Areas Rurales
PLANFOR	Plan de Acción Forestal
PNUD	Programa Naciones Unidas para el Desarrollo
PPD	Proyecto Pequeñas Donaciones, NNUU/PNUD
PROBAP	Proyecto para la Proteccion de la Biodiversidad y las Areas Protegidas
PROLANSATE	Fundación para la Protección de Lancetilla, Punta Sal y Texiguat
PMAIB	Proyecto Manejo Ambiental de las Islas de La Bahia
PROARCA	Proyecto Ambiental Regional de Centro America
PVOs	Private Volunteer Organizations
SINAPH	Sistema Nacional de Areas Protegidas

Executive Summary

According to AFE-COHDEFOR, 9,786,804 hectares (or 87% of Honduras' territory) are covered by forest soils, out of which approximately 50% remain under forest cover. However, some 80,000 to 100,000 hectares of these forests are lost annually, primarily from areas of broadleaf forest. Although pine forest appears more stable, it has suffered a drastic reduction in its regenerative ability and genetic quality. The present study finds **dry forest, mangroves, and humid or cloud forest, to be among the most threatened forest ecosystems in Honduras**. **Coral reefs and aquatic ecosystems in general, are the other highly threatened ecosystems.**

As a result of the high national rate of ecosystem modification and destruction, some 82 species of wildlife are included in the CITES appendices for Honduras. However, the question of how to prioritize threats to wildlife remains an area of debate among biologists, with no one willing to present a list of the five most threatened species. Although DIBIO did present a list of highly threatened species, others disagree. Consequently, it is better now to talk more generally about threatened families of wildlife, and to highlight just a few species. Threatened families in Honduras include the **parrots,** the **raptors,** the **wild cats** and the **marine turtles.** Most threatened individual species include the E**merald hummingbird** (endemic to the rapidly disappearing dry forest habitat); the **Quetzal** (whose cloud forests habitat is threatened); the **Manatee** (hunted for its meat and facing habitat contamination and destruction); the **Danto** (because of its size and territory); the **American crocodile** (hunted for its leather and meat; and the **Pink boa** of the Bay Islands (desired as a pet, feared and endemic). Among the plants, **all major commercial hardwood families are threatened**, including the famous Atlantic Honduran **mahogany** (Caoba) because of its lumber high value and scarcity and the entire family of **orchids** is threatened due to habitat destruction, particularly those **cloud forest species**.

To protect natural ecosystems and the biodiversity associated with them, the government has set aside 1.2 millions hectares of the total 5.2 millions hectares of forest in Honduras and declared them as protected areas. However, in spite of strong interest in conservation from the government and the international scientific community only about 25% of these protected areas are partially attended, due to their high tourism, scientific and economic value. Only some 38 protected areas have been selected priorities, and receive some type of management. The rest exist only on paper. All biodiversity studies are qualitative, and monitor with minimum equipment and technology, by a handful of park rangers that are present in these 38 protected areas.

One of the main causes of ecosystem modification and destruction **is man's lack of environmental awareness combined with either poverty, greed, economical or political power.** This lack of environmental awareness is exemplified by the following actions: a) agricultural and cattle policies that offer incentives to expand agricultural frontiers and replace forest with exportable goods and cash crops; b)

unclear land tenure that generates land use conflicts and the misuse of natural resources, including deforestation; c) high rates of population growth, which requires space and generates waste that contaminates aquatic systems; and d) alteration of wetlands to produce exportable goods and cash crops, such as shrimp.

Rural poverty is one of the most important threats to biodiversity in a country where 54% of the total population is concentrated in rural areas, and of which, 75% is under the levels of poverty. To survive, those living in poverty must use subsistence measures that affect the ecosystems and biodiversity, such as deforestation to acquire firewood and create open spaces to plant their food, burning forest in order to clear land, and farming on hillsides. All of these activities have negative impacts on watersheds, water production and quality, and the rate of soil erosion.

Government agencies such as SERNA/DIBIO, SAG/DIGEPESCA, COHDEFOR/DAPVS need substantial additional institutional capacity in order to be able to comply with their legal functions related to biodiversity conservation. The same can be said for University Biology faculties, which have good intentions to include more applied research in their curricula, but lack the resources to do so. Some university biologists work with their own money, in order to do research on biodiversity conservation. NGOs are struggling to make ends meet, and some that have signed agreements with COHDEFOR/DAPVS for joint management of a particular protected area, are either giving up or doing the bare minimum to develop management plans. Municipal environmental units also need capacity building such as more training and logistical resources in order to coordinate and work better with NGOs, government, and the private sector for biodiversity conservation.

All of the present threats and limitations to the conservation of biodiversity described above are at the same time opportunities to act. To overcome the current negative trends, there are a number of areas where the Mission could make a lasting difference on biodiversity conservation. All of these opportunities are focused on changing human conduct toward biodiversity and the environment, but in addition offer the potential to share the benefits of biodiversity; generating employment and rural family income; making businesses more competitive, and ensuring sustainable development.

This report presents a long list of opportunities for the Mission to participate more effectively in biodiversity conservation in Honduras. Here are highlights of several areas for which support should be considered: a) the creation of a autonomous Institute of Biodiversity, to support sustainable development, increasing productivity, and competitiveness in harmony with biodiversity; b) the development of an exchange university scientist program, to develop stronger monitoring methodologies; c) the continuation of environmental education at all levels; and d) the creation of more programs for the participation of rural communities in the benefits of biodiversity conservation, because unless biodiversity feeds the poor, the poor will eat biodiversity in order to survive.

Introduction and scope of work

The present assessment report identifies biodiversity conservation status quo and future needs in Honduras based on key threats and analysis of country, donor, municipalities environmental units, wildlife experts and environmental NGO responses. This assessment report attempts to address the following:

1. Describes the principal information and procedures currently available to study and monitor changes in biodiversity in Honduras, such as the status of inventories of flora and fauna.
2. Describes the principal threats to biodiversity, taking into consideration the views of the prominent stakeholders, whether they are ecological (i.e. fire, pests), related to human use (i.e. agriculture, contamination), institutional (i.e. failed policy) or transboundary issues, as appropriate.
3. Identifies the five ecosystems in Honduras which are currently most under threat of destruction or modification. Similarly, it identifies the species of flora and fauna, which are most threatened with destruction or extinction.
4. Describes the current national biodiversity policies and strategies, and makes recommendations for modifications and strengthening, as appropriate, in areas such as public awareness, land tenure, economic valuation of environmental goods and services, application of incentives for conservation and rational use of biodiversity, etc.
5. Evaluate the progress Honduras has made in compliance and fulfillment of strategies and objectives in biodiversity conservation as defined in the documentation ten or twelve years ago.
6. Consolidates the information of current and planned future biodiversity conservation efforts, by the GOH, NGOs, academic institutions and donor organizations. This includes a brief description of GOH agencies, key NGOs and academic institutions working in the sector, and an indicator of possible role to carry out studies which monitor the impacts and changes in biodiversity. Priority conservation needs which lack donor or local support are highlighted.
7. Describes forest management best practices currently being applied on public, municipal and private lands in Honduras, and makes recommendation, as appropriate, for continuation or modification of practices.
8. Makes recommendations to USAID/Honduras, as appropriate, for considerations under the new Strategy, to better meet the needs for biodiversity conservation and sustainable use of natural resources. Indicates any additional potential opportunities for USAID to contribute to biodiversity conservation through other strategic objectives, e.g. economic growth, municipal development.

For this assessment, we did literature review of the most relevant documents on biodiversity conservation (see annex #6), Time was short to be able to contact all the stakeholders, but through personal visits, telephone calls, faxes, e-mail and letters sent through the post offices, we made our best to contact all the most important

stakeholders. The desired situations, needs and recommendation, come from stakeholders, documents and from author's more than 25 years of experience working in conservation in Honduras.

Not all stakeholders and experts contacted found the time to share their knowledge and recommendations for better conservation strategies and actions but we thank all those that shared their knowledge and suggested recommendations to include in this assessment. We are sure the Mission will take the best of them and consider them for their new strategy.

The section on municipalities and NGOs of this assessment would have not been possible without the work done by Suyapa Dominguez, who dedicated long hours and days to patiently contacted all the key municipalities and NGOs that are included in this report.

We like to thank Dr. Gustavo Cruz and Lic. Pilar Thorn, both recognized authorities in the subject of biodiversity conservation in the country, for finding the time to meet with me and share their points of view to enrich the recommendations made in this report, as well as for their life work in conservation research and teaching.

Although new in his charge, we thank Ing. Conrado Gonzalez, DAPVS head at COHDEFOR, who was ready to provide all the information requested without any hesitation and contributed with valuable maps of protected areas and other related information.

The Finally, we thank the Mission for trusting us such an important assessment, knowing that we have been personally and professionally struggling for the last 25 years, to make conservation and development meet for the best interest of our country.

Jaime Bustillo
Author and main consultant

1. The main information and procedures currently available to study and monitor changes in biodiversity in Honduras.

In Honduras, the main information available to study and monitor changes in the state of biodiversity, such as inventories of flora and wild fauna, are dispersed across the country and even internationally[1]. Information exists in government offices such as (SERNA/DIBIO, SAG/DIGEPESCA and AFE-COHDEFOR/DAPVS). In the Museums of Natural History and Insects at the UNAH Department of Biology; in the herbarium and agro-forestry insect collections of the EAP, at El Zamorano; in ESNACIFOR, at Sigüatepeque, Comayagüa and in FHIA's library and herbarium at La Lima, Cortés. Also in NGOs' files, researchers' private libraries and even outside of the country in universities and museums that have been collecting under specific agreements in Honduras for many years.

According to DIBIO, the main inventory of Honduran flora is located in the EAP herbarium, which contains more than 300,000 thousands of specimens, representing some 75% of Honduras inventory with duplicates in several US museums and universities which makes it the largest in the CA region (Dr. Molina, personal comment). These specimens were collected since 1943 by actual botanist Dr. Antonio Molina, who also inherited part of the collection from botanist Paul Stanley's botanical collection. EAP students of more than 50 years have assisted the school botanists to collect, classify and preserve the specimens at the herbarium. EAP has agreements and shares information at the herbarium with scientific community all over the world.
The UNAH also has a herbarium, which is the result of 30 years of investigations and is used mostly for academic purposes. At UNAH-DB, Dr. Cyril Nelson manages the UNAH herbarium with the help of biology students, who organize short weekend botany and plant taxonomy class trips to collect and study flora. During these trips, the students observe and gather the specimens using normal scientific procedures: they labeling each specimen collected with the date, place, altitude, name of the collector, etc. Once back in the laboratory, they classify the collected specimens with their scientific and common names by comparing them with other previously collected specimens, identifying Family, Genera and Species. Once classified, the specimens are stored in closets for future reference.

The UNAH Department of Biology also has a museum of natural history, which has been under the responsibility of Saul Flores, since the 1980s. This museum contains specimens of fauna from expeditions to different places in Honduras, as well as specimens from occasional individual contributors. The procedure followed when collecting and studying wild fauna is similar to the procedure for flora described above. The Department organizes weekend class trips for students as part of the course program. During these trips, students observe fauna and, when necessary, they collect new specimens following scientific procedures for observation and capture. On return to the laboratory, they classify specimens by scientific and common names, and store

[1] SERNA. 1997. Environmental profile. Chapter X, pag. 195 Chart 79.

them for future reference. Many of these trips result from personal scientific interest of a particular teacher such as Pilar Thorn. Alone or with another colleague or advanced student, she organizes trips to the municipalities of Olanchito and Arenal, in the department of Yoro, to study the Emerald Hummingbird (Amazilia luciae). Pilar and her colleagues finance their expenses with their own resources. Another museum of natural history is located in San Pedro Sula, managed by the NGO Hector Rodrigo Pastor Fasquelle Environmental Foundation (FEHRPF). The students of local primary schools mainly use this museum. Both museums of natural history, the UNAH and the FEHRPF, have very small collections, but provide information to students, the public, and the scientific community. Both museums are in need of equipment, closets and bookcases, interpretation materials, and field equipment.

With respect to insects, UNAH, EAP, FHIA and ESNACIFOR are among the few places with scientific information and collections. These collections were begun mainly for agricultural and forestry applications, using sampling procedures similar to that described above for flora. These entities also organize expeditions to collect specimens that are endemic to that area or region. Such expeditions have resulted in the discovery of species endemic to Honduras, like the gem beetle, of the genera Chrysina, which had been considered extinct in the Cusuco National Park.

At present, very few procedures have been developed and very little is being done to monitor changes in the country's biodiversity. With respect to the conservation of biodiversity in Honduras, monitoring biodiversity is the area that receives the least amount of attention. There is no evidence of any efforts being made to inventory populations by species, not even for endangered or threatened species that are included in the CITES convention. The only information available for monitoring biodiversity comes from qualitative reports by park rangers or resource managers. Even this kind of qualitative monitoring by observation only takes place in most, but not all, of the 38 highest-priority protected areas, which represent only one third of the total areas declared and/or proposed to be part of the SINAPH. Of this qualitative monitoring, most is done by the limited personnel of the DAPVS in COHDEFOR and by park rangers or resource managers who have been trained in 5-day seminars carried out by the DAPVS/PROBAP[2].

One of the few, if not only, monitoring efforts that has been carried out over a decade is a self-financed, personal project of Dr. Gustavo Cruz, professor and investigator of the UNAH/DB). Over the past ten years, Dr. Cruz has supervised two 8 kilometer transects for game fauna (not commercial consumption) in two locations near Las Marias, in the Rio Platano Biosphere Reserve, in the Department of Gracias a Dios. Each transect covers different conditions: one includes an open field, guamil type of vegetation (degraded secondary shrub type forest), and the other includes forested vegetation.

[2] Leonel Marineros, Wildlife Section head at DPAVS-COHDEFOR.

The birds of Honduras resident and migratory, terrestrial and aquatic are monitored to some degree through visual observation in the highest-priority protected areas, by the DAPVS and park rangers that have been trained in such monitoring. However, Population inventories for any of the fauna species do not exist, even in cases where annual hunts are allowed, such as the white winged doves that visit Choluteca every year. Not one of the 46 endangered species included in the CITES[3] convention for Honduras has a population inventory, and visual observation by park rangers is the only form of monitoring that exists (personal communication of Mr. Leonel Marineros, head of wildlife COHDEFOR/DAPVS). As noted previously, one exception may be the qualitative research on Emerald hummingbird habitat that has been done for the last five years, with personal funding, by ornithologist Ms. Pilar Thorn and a few colleagues and biology students of UNAH biology department at UNAH.

The office of DAPVS, responsible for fauna admits to having too many logistical and budgetary limitations to carry out a population inventory; consequently, the wildlife monitoring assigned to DAPVS by law is based primarily on visual reports of park rangers from the highest-priority protected areas (personal communication of Mr. Marineros, head of wildlife for COHDEFOR/DAPVS). In 2001, the DAPVS began to register parrots and macaws kept in captivity as pets in two cities, Tegucigalpa and San Pedro Sula. However, this inventory is currently held due to a lack of resources (Ms. Marta Moreno, DAPVS, personal communication). Periodic headlines give a sense of the pressure that exists on some endangered species in Honduras. For example, this past November 4, the La Prensa newspaper declared: "*Six thousand macaws are smuggled illegally out of the country for markets in USA*" (p. 12). This kind of illegal exploitation has existed and intensified over the last 20 years, despite laws and agreements that prohibit it. The continuing lack of population inventories, with the exception of geographically focused and short-term information from biology theses, has allowed the illegal activities to persist. Currently, there is a high level of uncertainty about whether exploitation permits will be extended for certain species.

The state of monitoring efforts for aquatic fauna parallels those for terrestrial wildlife. Although by law, DIGEPESCA should be supervising and protecting commercial, salt water, and fresh water (in the rivers, lagoons and lakes) species, in reality, they are only able to undertake some of these responsibilities. For example, DIGEPESCA is responsible for monitoring the five species of marine turtles that visit the Caribbean coast, as well as the Pacific Ridley Sea Turtle "Golfina" (Lepidochelys olivacea) that is found along the Gulf of Fonseca. Although they are in charge of ensuring that fishing ships use the required nets to avoid turtle deaths, logistical limitations are so strong that they make this task almost impossible. DIGEPESCA personnel do manage artificial camps for turtle nesting. They also carry out public campaigns in an attempt to protect turtle species, but the efforts are very limited and do not show much promise in protecting these unique marine species.

[3] CITES Fauna Appendix www.cites.org.

With respect to commercial species, DIGEPSCA personnel carry out occasional supervision of fishing areas and inspections of cargo ships in the Bay Islands and in the ports where fishermen take their product, including markets and other sale points. Virtually nothing is being done for the freshwater fish species, aside from identification and classification projects by some biologists. There is no monitoring of endangered fresh water and salt-water species. Some efforts are made to monitor the sizes of fish taken out of the Yojoa Lake such as occasional patrolling of fishermen's boats.

There is necessary to mention also the existence of the Executive Directorate of Cadastre, which collaborates with other projects such as PAAR to collect information on current use of the soil, vegetation, and ecology, and to generate maps (scale: 1:50,000) for the eight departments of the country. The maps are created based on photo interpretation, aerial and field visits to valleys, and outdated aerial pictures (1977-79).

Finally, when discussing biodiversity information, it is necessary to mention also the good intention to create the National Environmental Information System (known as SINIA, in Spanish), created with the good intention to serve public need for data. Unfortunately, budget cuts and lack of support has affected the effective use of the SINIA. The SINIA section at SERNA web page www.serna.gob.hn/sinia is no longer responding. However, in 2001, SERNA published the "2000 Honduras Environmental Report", full of data about our biodiversity and environment, with the idea to concentrate in one source all the available information generated over the years[4].

In conclusion, the information available on the biodiversity of Honduras is scarce, dispersed, and partial, and is based not on population inventories but instead on qualitative inventories and limited academic studies. Most of the monitoring that does take place mainly covers only the 38 highest-priority protected areas. The environmental information is not so readable available to public.

[4] Other sources of information are well indicated on th e above mentioned report, on chapter IV, pages 92-95.

2. Principal threats to biodiversity, taking into consideration the views of the prominent stakeholders.

In general terms, negative human attitude toward its own environment is the main threat to biodiversity in Honduras. One of the main causes of ecosystem modification and destruction **is man's lack of environmental awareness combined with poverty, or greed or economical or political power.**

Many people do not have environmental education and awareness, and therefore they do not understand and appreciate biodiversity. Most prominent stakeholders consider that much damage to biodiversity is caused by a lack of environmental education. This lack of environmental awareness, leads to negative and destructive behavior toward the environment in general and to biodiversity in particular.

Rural poverty is another important factor in the destruction of biodiversity, because the peasant usually lacks basic school education, in order to satiate hunger, cut and burn their surroundings to sow basic grains for food. Rural poverty is one of the most important threats to biodiversity in a country where 54% of the total population is concentrated in rural areas, and of which, 75% is under the levels of poverty.

The rich owners of factories in general, and agro industries (sugar mills, African oil Palm, banana plantations and others)[5] in particular, also end up destroying biodiversity when they underestimate the impacts of their actions on environment and only think in greed.

The political and economical power also ends up in affecting negatively the biodiversity, by proposing wrong policies or by not proposing policies (i.e. Government agricultural frontier expansion with export crops such as coffee, shrimp production, etc.).

The key stakeholders were consulted for this report (biologists, forest managers, agricultural engineers, university teachers, resource managers, members of municipal environmental units, and other natural resource professionals who work with government agencies, NGOs, universities and companies). They all provided substantial information, but all identified more or less the same threats to the biodiversity of Honduras human activities.

Man's activities that threaten biodiversity are many and varied. They include the expansion of the agricultural frontier, the growth of cattle ranching, and the deforestation of wetlands (i.e. mangroves), pine, and broadleaf forest, as well as of dry forest, the habitat of the endemic Emerald hummingbird (Amazilia luciae). The daily processes meeting the demands of Honduras' rapidly growing population have resulted in rapid urbanization, accompanied by increasing demand for basic services such as

[5] Articles on newspapers, TV and radio. 1982, 1989 and 1997 Environmental profiles; SERNA EIA/DECA studies, etc.)

water, energy (firewood to cook), street access, food, employment, and much more. In turn, these demands result in the contamination of water and soil due to domestic waste.

Studies made over the years[6] have identified the following list as most important human made threats to biodiversity and the environment[7]:

1. High rate population growth and lack of education; accelerated urbanization
2. Migratory slash and burn agriculture deforestation;
3. Man-made clearings for cattle and agriculture activities; soil erosion;
4. Man-made forest fires; heat impact on soil flora and fauna.
5. Pesticide and synthetic fertilizer massive use;
6. Agrarian land reforms and the establishment of human settlements in fragile and critical ecosystems;
7. Illegal hunting (violations of age, size, condition, hunting dates and quantities);
8. Over-fishing; fishing with poisons and explosives;
9. Lack of respect for environmental regulations mitigation measures;
10. Clandestine sawmills proliferation;
11. Extensive cattle ranching and soil erosion;
12. Massive firewood extraction; habitat destruction;
13. Wildlife legal and illegal exportation (i.e. red and green macaws, iguanas, lizards, parrots, etc.);
14. Uncontrolled tourism at coral reefs; exceed carrying capacity;
15. Mangrove deforestation for shrimp farming expansion;
16. Construction of "coffee" penetration roads; coffee expansion policy;
17. Freshwater stream pollution related to coffee processing; industry pollution due to externalities; lack of mitigation plans supervision;
18. Capture of macaws and other wild animals as domestic pets;
19. Water pollution from industry (mostly textile, agro industry and mining).
20. Lack of and wrong natural resources policies and laws (market imperfections);

In addition to the impacts of urbanization and population growth, there is industrial contamination that can cause more damage than individual actions (i.e. tanneries, textile plants, etc.). Honduras is also vulnerable to natural ecological threats, like the destruction of the habitat caused by Hurricane Mitch (1998). No one has ever estimated the damage to biodiversity caused by Hurricane Mitch.

On the other hand there are also institutional conflicts that lead to environmental threats, for example the political realities that lead to the proliferation of manufacturing plants which discharge polluted water into rivers.

[6] SERNA/AID/PNUD/GEF/WB Envrionmental profiles (1982, 1989 and 1997). Also: DIBIO. 2001. Estudio sobre diversidad biologica de Honduras, Ch. IV. Section 4.1.8 pag.69; and Section 5.8 pag.112.

[7] These threats are cause-effect in relative terms, where poverty, greed and lack of environmental awareness are some of the the main causes of all man-made threats to biodiversity.

In 1974, COHDEFOR was created to export wood and generate foreign currency. In 1978, the existed the Unit for Protected Areas within Renewable Natural Resources Directorate (RENARE), with the resources to study threatened wildlife. In the mid 1980s, the Honduran Ecological Association (AHE) and other NGOs urged the government to create a system of national parks (now SINAPH) and to pay more attention to the conservation of wildlife. At the time, the government responded that their priority was to export wood. Today, 20 years later, despite the existence of the SINAPH, the situation is largely the same, only worse in magnitude. Today, not just some, of the ecosystems in Honduras are now under threat, and the days are limited for most of the species listed in CITES Appendixes (see annex #3 and #4).

One thing is clear, that in spite of all the efforts made during the last 20 years, biodiversity is still being lost at an alarming. Not counting species of flora, Honduras now has 82 terrestrial species and 88 aquatic species[8] (fresh water and marine) both listed under CITES[9], for reasons including those listed above.

These present threats are almost the same ones that existed 20 years ago; their magnitude has simply gotten worse. In the past 20 years, the population has almost doubled from 3.5 million to 6.5 million or more. Likewise, poverty increased, and the use of natural resources has worsened. As the number of industries in the Gulf of Fonseca in the South has quintupled, the potential to lose the whole array of wetland and aquatic species in the Gulf of Fonseca has become a reality, threatening traditional fishing.

Increased pressure on natural forests from firewood collection means that the rate of deforestation is high and still growing. An estimated 5 million tortillas are cooked daily in Honduras using firewood, not electricity (Proleña, 2002). In 1982 (USAID, country environmental profile), deforestation for firewood was calculated as high as 7 million cubic meters per year. In addition, forest fires are an ever-present threat, and are one of the big causes of destruction of forest habitat during the past years, especially when followed by shifting agriculture and extensive cattle ranching. Such activities impact both the volume of water in rivers and the survival of aquatic fauna, including all 88 species of fresh water fish that are found in Honduras (Martin, 1972, p. 151, DIBIO, 2001). Many of these species are found in wetlands, lakes and lagoons (i.e. Yojoa lake; the Alvarado lagoon in Puerto Cortes; Ticamaya and Jucutuma lagoons in Choloma; and other smaller lagoons), as well as in rivers (i.e. Choluteca river; Chamelecón river; Ulúa river, etc.). The loss of freshwater fish species it also represents the loss of a potential food source for both people and other aquatic and terrestrial creatures.

Biodiversity is also threatened when Honduran national fishing laws are not respected by other governments that share the resources, as happens in the Gulf of Fonseca. At the same time, many members of the national fisheries industry also do not make any

[8] DIBIO. 2001. Estudio basico de diversidad biologica de Honduras Annex #19 to 23.

[9] CITES appendix I, II and III for Honduras.

effort to respect the rules, for example with respect to restricted times of year and the use of illegal fishing methods.

In conclusion, the primary threat to biodiversity in Honduras is lack of environmental awareness in man, both rich and poor. The rich want power and wealth, lack environmental knowledge, and don't care about biodiversity. On the other hand, poverty is also a threat. If biodiversity does not feed the poor person, the poor person may put an end to biodiversity. When one's stomach hurts because of lack of food, any threatened species, whether plant or animal, can become food and, where it has commercial value, selling its parts of whole can become a way to obtain food and other goods.

In summary, one of the main causes of ecosystem modification and destruction is man's lack of environmental awareness combined with poverty, or greed or economical or political power. This lack of environmental awareness in general, is exemplified by the following actions: a) agricultural and cattle policies that offer incentives to expand agricultural frontiers and replace forest with exportable goods and cash crops; b) unclear land tenure that generates land use conflicts and the misuse of natural resources, including deforestation; c) high rates of population growth, which requires space and generates waste that contaminates aquatic systems; and d) alteration of wetlands to produce exportable goods and cash crops, such as shrimp.

3. The five most threatened ecosystems and species of flora, and fauna in Honduras.

3.1 Threatened ecosystems.

Actual north coast broadleaves is only 24% of 1962 and mangroves only 17% of 1964. Actual pine forest has recover 1.5 % of 1962 inventory [10] but suffers genetic generation. According to DIBIO, and the opinion of experts biologists at COHDEFOR-DAPVS, ESNACIFOR, UNAH-DB, UPNFM-CN, and recent surveys, the five ecosystems in Honduras, which are currently most under the threat of destruction or modification, are:

A. Terrestrial ecosystems[11]:

1. The tropical and subtropical broadleaf forest, especially cloud forest, such as: La Tigra National Park, Pico Bonito National Park, Cusuco National Park and Azul Meambar National Park.
2. The wetlands or mangrove forest on the Pacific and Atlantic coast.
3. The dry broadleaf forest of the south side of Pico Bonito National Park (Arenal and Olanchito municipalities, in Yoro).

B. Aquatic Ecosystems:

4. The coral reef ecosystem (part of the Mesoamerican coral reef).
5. Costal marine and freshwater lakes, lagoons and rivers.

It should be noted that the ecosystem classifications used here do not follow the recently published "Vegetative Ecosystem Map of Honduras" (House and Mejia, 2002, UNESCO/CATIE/UNAH-DB/PAAR-SAG, 2002), which is based on the UNESCO ecosystem classification system, rather than on Holdridge life zones system (see attached map and manual in CD). The new map identifies some 70 different ecosystems present in Honduras. While a parallel interpretation of this new system and the more traditional, Holdridge-based classification is certainly possible, it is not the goal of this short and rapid diagnostic on biodiversity. Consequently, this report follows the more familiar classification, as used by DIBIO and in other literature and in other projects and by many other authors (Nelson Agudelo, EAP).

The five ecosystems above are reported repeatedly in the literature with few exceptions, but with clear inclinations from one expert to another on the relative priority of each. The most important reasons why these five ecosystem have been selected over others are the following:

[10] Country environmental profile (1997, p.95-96)
[11] DIBIO. 2001. Chapter V. pag. 85

a) Importance for endemic species. According to Pilar Thorn, hummingbird expert, *the dry forest is the most endangered ecosystem today, she says, "the dry forest is a unique forest that represents the entire habitat area for a unique, endemic species, the Emerald hummingbird* (Amazilia luciae), and *I think that the dry forest ecosystem identified in the 2002 Map of Vegetation Ecosystem of Honduras, it is being burned at such a rapid rate that it no longer exists* ". Another group of experts finds that aquatic ecosystems should receive top priority, because neither humans, terrestrial wildlife, nor any of the dozens of fresh water fish and other organisms can live without fresh water. Still another group of experts suggest that broadleaf forests should have the highest priority, because of all the biodiversity their habitats imply, terrestrial as well as aerial (i.e. bats alone have 98 registered terrestrial species then there are the 82 CITES species).

b) Another reason why these ecosystems were selected is their vulnerability to fast growing threats of modification and destruction due to: the rates of expansion of the agricultural frontier and the fishing industry for commercial species (i.e. such as impacts of the shrimp industry on southern mangroves); the impact of manufacturing plants on rivers in the north (Sula valley, Cortes and Yoro area); the rapid growth of tourism fever on the north coast beaches (affecting turtle traditional nesting areas, mangroves, coral reef and landscape); and the increase in permanent urbanization and traffic due to local non-sustainable growth and development.

3.2 Threatened species of flora.

The following five species of flora were identified by DIBIO as those most threatened with destruction or extinction: Swietenia macrophylla (Big-leaf Atlantic mahogany); Cedrela odorata (Cedar); Magnolia yoroconte (Redondo); Pithecelobium echinatum (Laurel o cucharo); and Enterolobium cyclocarpum (Guanacaste). However, most of these selected species are present inside protected areas under some type of protection and management, with the hope that they will never be destroyed.

Many other species of flora certainly face threats[12], like all major commercial hardwood tree species, but especially the Big-leaf Atlantic mahogany, because of the high value of its lumber and its scarcity, the cloud forest tree ferns and all orchid family, because of habitat destruction. Therefore, experts including the author do not agree completely with DIBIO's selection of the five most endangered species of flora. Based on other criteria of importance of use e.g., medicinal, firewood, industry, food, fodder, wildlife habitat, ornamental use, climate control (shade), endemism and other cultural, socio and economic factors other equally important species are not included in DIBIO. Consequently, this list should not be taken as a unanimous recommendation and it may be better to set specific criteria, such as select families or critical fauna and flora

[12] CITES appendix I, II and III See explanatory notes on next page; COHDEFOR/SERNA 1992. 1997. Environmnetal profile. Anexo 19.

species for each critical ecosystem, rather than to select five flora and fauna species at a national level.

3.3 Threatened species of fauna.

The following five species of fauna were identified by DIBIO as those most threatened with destruction or extinction[13]: Trichechus manatus (Manatee); Crocodylus acutus (American crocodile); Amazilia luciae (Emerald hummingbird); Triprion petasatus (Casque-headed tree frog); and Hippocampus sp. (Sea horse). These DIBIO suggestions are not unanimously accepted by other biologists and specialists, who would prefer to substitute, in place of the Casque-headed tree frog and Sea horse, any species from the Parrot or Raptor families and the Wild Cats.

Members of the **Parrot family** (i.e. small and large, parakeets, parrots and macaws) are under extreme pressure because of their high value in the U.S. pet market. Members of the **Raptor family** (i.e. owls, eagles and falcons, especially the Harpy eagle) are threatened because they are associated with bad luck and had bad reputation. Members of the **Wild Cats family** (i.e. including large and small wild cats such as the jaguar, the mountain lion, etc.), are under extreme pressure because they are feared, hunted for their skin, and face habitat destruction (especially the jaguar), and are considered a serious threat for domestic animals and children. Member of **Marine Turtle** family (i.e. Pacific Ridley, Carey, etc.) are under extreme pressure because of beach invasion by developers, nesting areas destruction and high rate eggs consumption.

3.4 Summary

In summary, report finds that broadleaf dry forest, wetlands (mangroves), and broadleaf humid or cloud forest are the most threatened forest ecosystems. Aquatic ecosystems in general (i.e. rivers, lakes and estuaries), and coral reefs in particular, round out the list of the five most threatened ecosystems in Honduras. Because many experts did not concur with the selection of endangered flora and fauna suggested by DIBIO, this report suggests focusing on threatened family groups as well as a few individual species. All of the following families and species are highly threatened, and all are included under CITES appendixes, I, II and III.

Flora: all major commercial hardwood tree species, but especially the Big-leaf mahogany, because of the high value of its lumber and its scarcity; and the cloud forest tree ferns and all orchid family, because of habitat destruction.

Fauna, families: the **raptor family** (owls, eagles and falcons, especially the Harpy eagle); the **parrot family** (small and large, parakeets, parrots and scarlet macaws

[13] See SERNA. 1997. Environmental Profile, Annex #19, 20, 21 and 23 for full text.

especially); the **wild cats family** (all species, small and large, but especially the jaguar and Ocelot) and the **marine Turtle** family (all species).

Fauna, single species: the **Emerald hummingbird**, because it is endemic and its dry forest habitat is being rapidly destroyed; the **Quetzal**, because its cloud forest habitat is threatened; the **Manatee**, because it is hunted for meat and its habitat is being contaminated and destroyed; the **Danto**, because of its size and territory; the **American crocodile**, because of it is hunted for its leather and meat; and the **Pink boa** of the Bay Island, because is hunted as a pet, feared, and endemic.

In summary, although most experts agree with the five ecosystems identified here, no one is in total agreement with the five fauna and flora species selected by DIBIO. Consequently, it may be better to set specific criteria, such as select families or critical fauna and flora species for each critical ecosystem, rather than to select five flora and fauna species at a national level. Also, support and follow CITES strategies to try to plan local strategies to try to save as many species as possible, included in CITES appendixes for Honduras.[14] (See annex #3 and #4).

[14] CITES appendixes explanatory notes:

- Appendix I includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances.
- Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival.
- Appendix III contains species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade.

Source: www.cites.org

4. Current national biodiversity policies and strategies, and recommendations for modifications and strengthening.

The national biodiversity policies and strategies currently followed by the Government are described in the " Estrategia Nacional de Biodiversidad y Plan de Acción" (DIBIO 2001) and COHDEFOR PLANFOR [15].

The National Biodiversity Strategy contains the official government policies and strategies, but in the real world these policies and strategies are being neither fully implemented nor fully enforced. This is due, among other factors, to a lack of resources and the recent change in the government and governing officials.

Officially, DIBIO has identified four major strategic areas for action[16], these are: conservation *in situ* (in 73 officially listed protected areas); conservation *ex situ* (in botanical gardens, zoo orchards, seed germplasm banks, zoos); technological generation and transfer; and equal distribution of benefits of conservation.

These four major strategic areas include 11 policies, one for each thematic area. The policies are: protected areas, conservation, sustainable use of biodiversity, environmental education, research and training, land use, environmental licensing, information exchange, incentives, access to genetic resources, and biotechnology and biosafety.

For these 11 policies, DIBIO has formally stated 24 strategies and has developed an action plan for each strategy. These strategies are (in no particular order):

- To strengthen public participation.
- To create a system of private protected areas.
- To ensure the right distribution of benefits from protected areas.
- To create the protected areas Fund.
- To create a legal basis for conservation of biodiversity.
- To create a legal as well as a technical mechanism to coexist in harmony with ethnic local groups.
- To incorporate environmental education into the national educational system.
- To develop informal environmental education programs.
- To develop public environmental campaigns.
- To identify and prioritize scientific research needs.
- To create a national program for scientific research.
- To contact and establish agreements with national and international organizations to strengthen national scientific research capabilities in biodiversity.
- To continue making effective environmental impact statements.
- To continue efforts toward land use legislation according to land capabilities.

[15] See also PLANFOR. 1996. Plan de Accion Forestal 1996-2015. Vol.II, Anexo 2, pag.15 to 35
[16] dibio. 2001.

- To promote the implementation of the National Environmental Information System.
- To warrant intellectual rights on information to developers and owners.
- To create incentives to motivate national and international investors to implement sustainable projects in Honduras.
- To promote fair legislation in order to achieve access to genetic resources and the fair distribution of the benefits derived.
- To promote mechanisms to add economic value to genetic resources.
- To promote information generated about the regulation of genetic resources and procedures and regulations for its use.
- To promote the subscription, ratification, and implementation of the Central American protocol for Biotechnology and Biosafety.
- To ratify the Cartagena Biosafety protocol.

Although the development of a national Biodiversity strategy on paper is a step towards fulfilling commitments made to International Protocols and Conventions, some people comment that Honduras is full of papers with strategies and policies, and even laws and regulations, that make almost no difference to the real status of biodiversity, which continues to decline. In other words, having such strategies and policies on paper is not a guarantee of biodiversity conservation in practice in the field.

In addition, even on paper, the policies and strategies still contain gaps and redundancies. Some policies include more specific goals and objectives, while others fall short of how they will achieve their goals. One good example of a clear policy is the one that regulates conservation, stating that conservation should be done both *in situ* and *ex situ*. This is a clear line of policy that opens up opportunities for local strategies, such as creating protected areas and working in coordination with NGOs, municipalities, university experts, etc. This is a good example of a desirable way to undertake conservation. However, even after their validation in nine different locations, the documents produced by DIBIO (2001) with the cooperation of dozens of other institutions, experts and the public still contain strategies that are unclear. For example, the strategy for the equal distribution of conservation benefits policy. One major challenge is how to avoid converting the document that contains the policies, strategies, and action plan into just another historic conservation effort. Indeed, in the past there have been a number of similar efforts, such as those included in country environmental profiles produced in 1982, 1989 and most recently in 1997. Each profile shed light on how to save the environment and avoid the loss of the "NOAH'S Ark of Honduras", but each has failed in application, and the ark continues to sink.

The following paragraphs offer some recommendations for better policies and strategies that, if put into practice, may eventually change the ongoing negative trends in biodiversity in Honduras. Based on all of these factors, this report presents recommendations for three of the key policies line of actions formulated by DIBIO:

1. The Conservation policy is well developed, although the strategy of working with biodiversity both in situ and ex *situ* should be highlighted. Recommendations for actions include:

a) Increase on service training in biodiversity conservation for both technicians and college students under the supervision of university professors.

b) Expand exchanges by student and professors between local and international colleges and universities, encouraging research that is focused on CITES-listed species and carried out in protected areas.

c) Promote Honduras as a location for fruitful sabbatical years for professors and advanced graduate courses.

2. The Generating and Transferring Technology and Information policy is well defined. Honduras should continue to seek applied research for biodiversity conservation, particularly focused on priority species of flora and fauna. Environmental education campaigns, although expensive, are also needed, as is the exchange of information related to biodiversity. Recommendations to cover other important needs should include:

a) Creation of an autonomous institution responsible for all biodiversity information in Honduras. Such an institute should collect and disseminate existing information, and undertake long term research planning and prioritization in conjunction with universities, NGOs, and government, both national and internationally. The creation of an autonomous Institute of Biodiversity would reduce or eliminate the negative impacts of government changes, thereby improving the continuity and sustainability of biodiversity research.

b) Implementation of basic studies such as species inventories and, more importantly, the design of monitoring plans based on scientific procedures for priority species in order to understand the impact of human activities on their habitats and populations over time.

c) Availability and dissemination of biodiversity information should be improved so that knowledge is open to anyone interested in with the status of a particular species habitat or population. Openness should be championed by those who investor in the use of natural resources and by governmental agencies in charge of authorizing such use through environmental licenses.

d) Resources are needed to operate conservation activities both *in situ* and *ex situ*. Strategies should be developed to maximize funds from a variety of sources, including fees for product and services, as well as donations and fundraising

3. The Equal Distribution of Conservation Benefits policy is an excellent initiative, but its implementing strategies are not clear. Recommendations to cover other important needs should include:

a) Continue to seek financial incentives oriented to invite private sector to invest more in biodiversity conservation for sustainable development.

b) Give the incentives more promotion among private sector, to encourage general managers to participate in sponsoring biodiversity conservation programs.

c) Work harder in designing a strategy on how to really make poor rural communities neighboring protected areas, benefit directly from biodiversity conservation, by means of income, employment, cash benefits from products or services, etc.

The results of these simple recommendations will make a significant difference in the status of biodiversity over time, and would minimize the negative impacts that the change of government power has sometimes had on the resources and continuity of biodiversity research programs. These actions would also increase the dissemination and availability of biodiversity information ensuring that experts receive due credit for their research, while the public receives access to information to enhance sustainable use of their resources.

5. Progress Honduras has made in compliance and fulfillment of strategies and objectives in biodiversity conservation, as defined in the documentation ten or twelve years ago.

One of the documents used as a base line to make comparisons between recommendation made ten years ago and the current situation was the Country Environmental Profile (SECPLAN 1989). This document presented general and specific recommendations.

A) General recommendations made in the 1989 Country Environmental Profile

It made general recommendations for all sectors, such as basic data maintenance, promoting scientific research and team work with experts from Universities (UNAH), maintaining training programs, reviewing and strengthening legislation, institutional strengthening, cooperation between NGOs and the government offices, and more integrated management of critical ecological areas.

In looking back at these general recommendations, we cannot say that in general, things are better now than ten years ago.

- For example, the maintenance and management of basic biodiversity data collections continues to rest in the hands of the experts and institutions that generated the information in the first place.
- With the exception of those projects that have developed a web page that makes data available, most information on biodiversity in Honduras is still unavailable to the public.
- The public does have access to information included in annual reports, but these are available in a very limited number of issues. Since the National Institute of Statistics (INE) has been created (2001), and offers free statistical information by email, it should also provide biodiversity statistics with information generated by DIBIO, DAPVS, UNAH, etc. (or future proposed Biodiversity Institute).
- Scientific research promotion has been part of DIBIO's role, but there are few success stories available, limited mainly to a few publications and collaborations with other institutions, such as COHDEFOR/DAPVS.

Carrying out training programs is one of the areas that have been fruitful over the last 10 years. From short seminars to postgraduate studies, many people have benefited. Unfortunately not all of those trained have been hired, and not all are working in the areas in which they were trained. This situation needs additional work in the future.

Many laws have been revised and strengthened over the years, but the most important document in environmental legislation is the final issue of the Environmental Law and its Regulations. Institutional strengthening and cooperation between NGOs and government offices has improved substantially during the past 10 years, changing from

attitudes of indifference and jealousy to new written agreements, co-management of protected areas, and more integrated management of critical ecological areas.

B) Specific recommendations made in the 1989 Country Environmental Profile

In 1989, the Country Environmental Profile made specific recommendations by sector, such as hydrology and watershed management, agriculture and livestock, forestry management, coastal resources, protected areas and wildlife, environmental pollution, environmental education, and legislation. The current situation so far is this:

- The Water Law has not been approved and, although watershed management efforts have addressed specific watersheds such as the Choluteca and El Cajon, hillside farming and erosion continue to negatively impact the water resources of Honduras. Currently, the government is trying to introduce a special fee for watershed management within the new Forestry Law. However, this has been attacked from all directions, which means that watershed management will not be a general policy or national project, but will be limited to specific projects such as MARENA (BID 2002), PROARCA/APM (USAID 2002). River systems are polluted and water volumes are decreasing. Visually, water quality is less acceptable, and aquatic life is in decline as well. For all of these problems, CESCCO monitoring of water quality is very limited.

- The agriculture and livestock industry is growing, but becoming less productive due to depletion of soil nutrients and soil erosion. Over the past decade, agro-forestry projects have been promoted and people have been trained, but land is still prepared for agriculture by burning, and pesticides continue to be the main method of controlling pests.

- The most innovative strategy in forestry management is the use of management plans, which promote and support forest regeneration. However, the implementation of management plans lacks supervision in the field, and the use of measures to mitigate negative impacts is not verified. Lumber sales mechanisms have been improved to ensure a better government tax collection from lumber sales. Forestry Law was changed under the new Modernization of the Agricultural Law and COHDEFOR is no longer the only forest owner in Honduras. Forests that have been returned to private ownership can be exploited following approved Management Plans. Municipalities have recovered ownership and use rights of their forestlands, so long as they follow approved management plans. Protected areas have proliferated to more than 100 of them, but only 38 are recently selected as high-priority, the rest are just in paper.

- During the past 10 years, coastal resource management has failed to improve, and mangrove forests continue to decline at very rapid rates. The immense, unmeasured shrimp harvest, by shrimp companies contributes to the

deterioration of mangroves (CODDEFFAGOLF, permanent official statement). All along the coasts, natural causes such as coconut palm yellowing are killing many palms, affecting local family industries as well as the tourism industry.

- Protected areas and wildlife management is one sectors that has grown in public and official recognition as an important sector for water production and one future aspect of the tourism industry. This as a result of greater environmental awareness of the public, especially among politicians, congressmen and policy makers. At least 38 protected areas are considered high priority (see annex #2) and are under some level of management.

- Unfortunately, in terms of environmental pollution, very little progress has been made. Those rivers that pass through large cities such as Tegucigalpa and San Pedro Sula are completely polluted. In spite of all the good efforts made by CESCCO, monitoring of water quality by CESCCO is very limited. More recently, the National Center for Cleaner Production (CNP+L) was created in San Pedro Sula[17] to work with factories and business entrepreneurs to cut on pollution and assist in ISO certification and more competitiveness.

- Over the past decade, there have been widespread recommendations and actions on environmental education both formal and informal, but much remains to be done. For example, an official from the environmental unit of one municipality asked what biodiversity was when asked to provide information about environmental activities for biodiversity conservation in his municipality.

- Finally, in terms of environmental legislation[18], there has been many positive changes in the Law, such as the approval of the Environmental Law (Decree # 104-93) and Regulations (Decree # 109-93); Municipal Law (Decree # 134-90, 48-91 and 18-93) for waste management; the Protected Areas and Wild lands Rule (#921-97); Wildlife Prohibit Rules (#001-90). Also the signature of important International Conventions, such as Montreal Protocol (Vienna Convention) on ozone layer protection (May 4, 1993); Biodiversity Convention (February 21, 1995); and other historic Conventions. The creation of the Environmental Public Ministry for the General Attorney (Fiscal) office. In the other hand, they work under very limited resources that makes it almost impossible to fully implement their role.

In conclusion, in general, biodiversity conservation is not much better now than it was ten years ago. There are now more activities being implemented in more places, new laws and institutions, but these still come short of the overall needs. The goals laid out

[17] Adjacent to Camara de Comercio e Industrias de Cortes (CCIC), and sponsored by the Honduras-Canadian Fund.

[18] DIBIO. 2001. Marco Juridico e Institucional, "Estudio sobre diversidad biologica de la republica de Honduras" Chapter III p.31. Serna. 1997. Environmnetal profile. Chapter XI. Pag.209

ten years ago were not ambitious goals, and what has been accomplished during this decade has been too little for present times. Still we have 82 listed species in CITES appendixes[19] with 216 species listed in flora (see annex #3) and more than 267 in fauna (see annex #4).

There are more environmental NGOs today than ten years ago[20]; however, they make very little difference in biodiversity conservation relative to the magnitude of present threats, because they lack enough resources to implement their programs[21].

Either more must be done now, even at high cost if necessary, or all Hondurans will suffer the consequences of not taken more actions in biodiversity conservation. As President Maduro once said in a private meeting where the author was making an environmental education presentation, *"the price of education is high, but think of the price of ignorance".*

[19] www.CITES.org

[20] In 1982, existed only one environmentally oriented NGO (Honduran Ecological Society, AHE); in 1989, there were 7 and in 1997, there were some 150 NGOs environmental oriented (SERNA. 1997. Environmental profile, p.94).

[21] Fundacion Vida has been for a decade the most important source of funding to NGOs but their funding in the future is always uncertain (Ing. Jorge Quiñonez, Fundacion Vida Director, personal comment). Also mentioned by all NGOs directors.

6. Consolidated information regarding current and planned biodiversity conservation efforts by the GOH and donor organizations.

6.1 Brief description of the GOH projects, key NGOs, and Universities working in the sector. (See annex # 5)

A. Key Government Projects:

1. General Directorate of Biodiversity (DIBIO) of the Secretary of Natural Resources and Environment (SERNA).

DIBIO is responsible for driving actions for the protection and conservation of the biodiversity, in coordination with AFE-COHDEFOR, as the principle implementer, and with other organisms with expertise in this field. They permanently assist the SERNA vice minister in preparing reports for CONAP; oversee the execution of CITES, RAMSAR, SAM, and other international agreements and conventions; support the DECA of the SERNA; prepare technical papers in consultation with the DAPVS; and prepare executive agreements related to the SINAPH. The DIBIO is a scientific Member of CITES for Honduras. They coordinate the activities of the rest of the Scientific Members for Honduras.[22]

2. Department of Protected Areas and Wildlife (DAPVS) of the Forest Administration of the State (AFE-COHDEFOR).

DAPVS assumes the normative responsibility to regulate and manage wildlife and the protection and management of protected areas. The main objective of DAPVS is to develop and carry out the policies and technical norms for the development of the program of protected areas and wildlife. DAPVS is organized into two technical sections: Protected Areas and Wildlife. Protected Areas staff prepares management plans; maintain information on the protected areas; and pursue the legalization of the same. Wildlife staff regulate and manage the use of wild terrestrial flora and fauna; and establish the appropriate mechanisms for the implementation of CITES and other related agreements in Honduras. The DAPVS is a Scientific Member of CITES for Honduras.

3. Project of Biodiversity in High-priority Areas (PROBAP phase II). (GEF, World Bank, and UNDP, with COHDEFOR).

PROBAP is carried out in the Departments of: Atlántida (8 Municipalities), Olancho (3 Municipalities), and Gracias a Dios (4 Municipalities). It is a combined initiative of the World Bank and UNDP to help the Honduran government to carry out actions in the Meso-American Biological corridor, and to prioritize the most critical protected areas.

[22] The other CITES scientific members for Honduras are: EAP/Zamorano, ESNACIFOR/Siguatepeque, DIGEPESCA/SAG, DAPVS/COHDEFOR and DIBIO/SERNA (coordinator) (Estudio Biodiversidad, p.34).

4. Administration of Rural Areas Project (PAAR).
PAAR gives support to DAPVS AFE-COHDEFOR for the development of a strategy for identifying and prioritizing the areas of highest value within the National System of Protected Areas of Honduras. It carries out demarcation and rural cadastre activities in several protected areas.

5. Project for the Management and Protection of the Rio Platano Man and the Biosphere Reserve (PBRP/GTZ).
PBRP has several components, including: protection of the core zone, ecodevelopment (forest and agricultural management); protection of the cultural zone; ecotourism; environmental education; legalization of lands; and research, monitoring, and evaluation.

6. Mangrove Conservation Project (PROMANGLE). (International Organization of Tropical Wood, OIMT).
PROMANGLE has already ended, but some activities are still underway. The goal of the project was to reduce pressure from local communities on the mangrove forests of the Gulf of Fonseca. The project included direct forest management and plantations of rapidly growing species for fuel wood. The project was active in the whole Department of Valle and parts of the Municipality of Marcovia in the Department of Choluteca.

7. Honduras Environmental Protection Fund Project (HEPF). (USAID).
HEPF works through Fundación Vida to support the management of protected areas (PAs) and critical watersheds, through NGO's at national level.

8. Forest Policies Support Project (PROFOR). (GTZ).
PROFOR supports multiple use forest management to satisfy social and environmental demands through long-term national forest policies. The project is active in four Departments: Francisco Morazán (in Tegucigalpa), Comayagüa (in Siguatepeque), Olancho (in Gualaco) and Choluteca (in Choluteca city).

9. Community Forestry Support Project (AFOCO). (GTZ).
AFOCO seeks the full involvement of members of the participant communities in Yuscaran, El Paraíso Department to improve their living conditions by means of the rational and sustained use of natural resources.

10. Multiphase Management of Natural Resources in High-priority Watersheds (MARENA/IDB).
MARENA works through the National Program of Sustainable Rural Development (PRONADERS of the SAG/IDB-BM). The first phase (3 years) includes organizational strengthening, institutional consolidation, local participatory processes, and tests of investment mechanisms. A second phase (5 year) will work to expand and consolidate experiences from the first phase. During the first phase, MARENA will work in three high-priority river basins: Ulúa, Chamelecón and Nacaome.

11. Proyecto de Manejo Ambiental de las Islas de la Bahia (PMAIB phase I), within the Honduran Tourism Institute (IHT) and sponsored by the GOH and IDB.
PMAIB develops basic information that is available to public and prepared in 2001, there are some 22 different reports on the marine and terrestrial resources of the archipelago carried out by PMAIB's subprogram of natural resources. It has a full time staff specialized among others on marine resources, environmental management, economics, environmental engineer and administration. Note: Phase I ends in 2003, but a second phase will continue implementing an integrated management plan for the sustainable Bay Islands development.

12. Regional Environmental Program for Central America (PROARCA). (USAID).
PROARCA contains three components: Protected Areas and Environmental Marketing (APM), Harmonized Environmental Legislation (LEGIS), and Less Polluting Technologies (SIGMA). The APM component is administered by The Nature Conservancy (TNC) with the World Wildlife Fund (WWF) and the Rainforest Alliance (RA). The program works in the Gulf of Fonseca, the Gulf of Honduras, Yojoa Lake, and the Honduran Mosquitia.

13. Effective and Sustainable Water Management (MESA) Activity. (USAID). This very important project is design to improve the watershed management, forests and protected areas through NGOs, municipalities, associations and citizen groups as well as relevant GOH agencies involved with water resources issues.

14. General Directorate of Fishing and Aquaculture (DIGEPESCA).
DIGEPSCA, in SAG, is responsible for the registration and monitoring of fishing for different species, as well as the protection of marine species along both coasts and in Lake Yojoa. It regulates and carries out inspections of artesian and commercial fishing. DIGEPESCA also implements the MODERPESC A project that provides technical assistance to authorized fishermen. The DIGEPESCA is a Scientific Member of CITES for Honduras.

15. Directorate of Science and Agricultural Technology (DICTA).
DICTA, in SAG, is responsible for the design, coordination, and implementation of agricultural and technology transfer programs to increase productivity and competitiveness within the agricultural sector. Among other activities, it works on an agro-ecological characterization census of the main valleys, on planting lethal yellowing-resistant coconut trees. It also has developed the Regulation for Organic Agriculture. Through the PROMOSTA project, DICTA have begun to develop strategies and policies for the privatization of agricultural technical assistance services.

16. National Directorate of Sustainable Rural Development (DINADERS).
DINADERS, with support from the European Union/SAG in SAG, is charged with implementing and coordinating the policies and strategies of the National Program of Sustainable Rural Development (PRONADERS) related to the reduction of poverty and

environmental vulnerability and the improvement of quality of life for rural communities. Project highlights include JICATUTYO in Copan; and the PROLANCHO in Olancho.

17. Regional Watershed Management Project (FOCUENCAS).
FOCUENCAS is implemented jointly by SAG, SERNA, AFE-COHDEFOR and CATIE and works in the sub-watersheds of the Grande River in Reitoca (p. 47 memory SAG 1998-2002).

18. Rural Development Project of the Eastern Central Honduras (PRODERCO).
PRODERCO works in alliance with AFE-COHDEFOR in forest protection in the region and in organizing environmental committees.

19. Rural Development Project of the Southwestern Honduras (PROSOC).
Among other things, PROSOC works in the organization and strengthening of Municipal Environmental Units (UMAs).

20. South Lempira Project (FAO).
The FAO project works in natural resources management, facilitating biodiversity restoration through reforestation, soil conservation, and control of forest fires.

21. National Agricultural Health Service (SENASA).
SENSA, in SAG, is responsible for the protection, quality, and conservation of vegetative and animal products, by promoting pest and disease controls, which do not damage to the environment and biodiversity. It is also responsible for pesticide the registration, sampling, and proper use. SENSA has signed agreements with the Honduran Coral Reef Fund (HCRF).

B. Key National Non-Government Organizations (NGOs)

1. Fundación Hondureña de Ambiente y Desarrollo "Vida". (USAID/PNUD/GOH)
Their main activity is fund raising in order to finance projects implemented by other organizations. Approximately 60 % of the projects that they finance are related to biodiversity conservation.

2. Bay Island Conservation Association (BICA)
They are working in biodiversity conservation in the Marina Sandy Bay-West End Reserve and in the Turtle Harbor Wildlife Refuge in the Bay Islands.

3. Fundación Capiro y Calentura (FUCAGUA)
They are working to consolidate the management plan for the Capiro Calentura National Park and the Wildlife Refuge of Laguna de Güaimoreto, in Colón.

4. Asociación de Municipios del Lago de Yojoa (AMUPROLAGO)
They are working to conserve the biodiversity of Lake Yojoa.

5. Asociación Ecológica del Parque Nacional Pico Pijol (AECOPIJOL)
They work with local and municipal participation to conserve the Rio Pijol watershed and Pico Pijol National Park.

6. Mosquitia – Pawisa (MOPAWI)
In coordination with local committees, they are monitoring natural resources and protecting wildlife in the Rio Plátano Man and the Biosphere Reserve.

7. El Comité para la Defensa y Desarrollo del Golfo de Fonseca (CODDEFFAGOLF)
They are working on monitoring wetlands, developing ecotourism at the rural community level, developing management plans, and other social programs.

8. Fundación Cuero y Salado (FUCSA)
They work at the Cuero y Salado Wildlife Refuge on wildlife protection, watershed reforestation, formal and informal environmental education regarding wetlands, and ecotourism.

9.Fundación Ecologista HRPFasquelle (FEHRPF)
Since 1994, they have been working in the Cusuco National Park, including work on the visitor center and trails. However, they have suffered financial problems that endanger their capacity to continue these efforts.

10. Fundación Parque Nacional Pico Bonito (FUPNAPIB)
They work in Pico Bonito National Park on the visitor center and trails, and on buffer zone reforestation and other agroforestry practices.

11. Fundación para la Protección de Lancetilla, Punta Sal y Texiguat (PROLANSATE)
They are working to delimit the Punta Izopo and Jeanette Kawas National Park.

C. Key International Non-Governmental Organizations (NGOs) and International Private Voluntary Organizations (PVOs).

1. The Nature Conservancy (TNC).
Administers the component of Protected Areas and Environmental Marketing (PAM) of the Regional Environmental Program for Central America (PROARCA/USAID, and it is executed next to the World Wildlife Fund (WWF) and the Rainforest Alliance (RA). These international environmental non governmental organizations, have formed a single work group and they are executing in cooperation with national institutions, the component Protected Areas and Marketing (PROARCA/PAM), in four high-priority places: Gulf of Fonseca, the Gulf of Honduras (Honduras-Guatemala), The Honduran Mosquitia and the Lake of Yojoa.

2. World Conservation Society (WCS), it has been supporting the NGOs of the north coast with the elaboration of handling plans for Sandy's protected areas Bay (Roatán),

Turtle Harbor (Utila), Capiro and Fever (Trujillo), Park Janneth Kawas (Cloth), and the Archaeological Park of they Surround.

3. Peace Corps (PC), has a natural resources and environment component and Agriculture and Aquiculture, an extensive net of Volunteers that work in these two components, in the South and Center-Western area of the country. The topics that develop go from elaboration of manuals of they environmental education and trails interpretation, to build trails in protected areas, run forest nurseries and do reforestation. They advise and they collaborate among others with NGOs, municipalities and schools.

4. CARE International in Honduras, the Project Feeding Security (EXTENSA/USAID), it contains three components, one of which deals with Integrated Management of Watersheds, with 15 municipalities in the departments of Lempira, Intibuca and La Paz; project of organic coffee in the village San Luis in Santa Bárbara (PROEXPORT); the project. Community Forestry (LENCAFOR/European Economic Community).

5. Global village, they are in charge of the Cerro Azul Meambar National Park, in Comayagüa and Cortes; they have a visitor's center, and other visitors' facilities. They are a model of success for park management and the attention of ecotourists, national and foreign, and that it generates employment and revenues to the community, at the same time that they practice biodiversity conservation.

D. Universities and Higher Education Institutes:

1. Autonomous National University of Honduras (UNAH) and Atlantic Coast Litoral Regional University Center (CURLA).
The UNAH Department of Biology (DB) is a leader in training the future biologists of the country and the region. The Department also training students in protected area and wildlife management, ecotourism, and other areas related to biodiversity (botany, zoology, etc.). The CURLA trains future forest and agronomic engineers for Honduras. In both university campuses, professors under their own initiative carry out small research projects related to the flora and fauna in protected areas. In addition to courses, the UNAH DB also offers scientific services through its Herbarium and Museum of Natural History and Insects. The UNAH is a Scientific Member of CITES for Honduras.

2. National Pedagogic University Francisco Morazán (UPNFM).
The Natural Science department of the UPNFM academically prepares future schools teachers in natural sciences, including biology. As at UNAH, the biology professors use their own initiative and funds to carry small investigative projects related to the flora and fauna in protected areas.

3. Pan-American Agricultural school (EAP).
EAP, at Zamorano, is charged with training future agronomists, agricultural engineers, and others in related areas. EAP has the largest and best Herbarium plant collection in the country, as well as an insect collection, the research center "Uyuca Biological Reserve", and a scientific library. In addition, the EAP carries out projects in watershed management, integrated pest management, and hillside farmers training. The EAP is a Scientific Member of CITES for Honduras.

4. National School of Forest Sciences (ESNACIFOR),
ESNACIFOR is responsible for preparing the future foresters of the region. They also carry out research projects funded by the international donor community. They have a herbarium, collection of forest insects, seed bank, and scientific library. The ESNACIFOR is a Scientific Member of CITES for Honduras.

6.2 The potential role of studies to monitor impacts on and changes in biodiversity.

The potential role of the actual governmental and non-governmental institutions, as well as universities, in charge by law of monitoring impacts on and changes in biodiversity, is in doing better what they already have under their legal responsibilities. For example, better monitoring data design, collection and processing tools; better data exchange among stakeholders; and better international links with CITES and interested US universities. However, this potential role in monitoring impacts on and changes in biodiversity caused by nature or man-made disasters needs to be supported with more resources. This potential role needs more resources in monitoring infrastructure, field and office equipment, personnel training, technical assistance (internal and external), in order to be implemented.

Neither COHDEFOR, nor any environmental NGO, nor any university biology department is implementing quantitative inventories of any of the species listed in CITES for Honduras (particularly endemic ones), or evaluating the impacts of natural disasters on biodiversity. For example, no one has monitor the impact and changes in biodiversity caused by Mitch hurricane; 20 years of forest fires; 50 years use of agrochemicals on soil and water biodiversity; 30 years of over hunting and habitat destruction; etc. While such studies are undoubtedly expensive, it is more costly to lose endemic species forever. There are no evidences of quantitative inventories done for any of the 82 species on the CITES list in Honduras.

Even with qualified, well-equipped personnel, such as the park rangers in most of the 38 highest-priority protected areas, making qualitative species monitoring, there is no knowledge of CITES species populations. There is a clear need also to carry out quantitative inventories of species listed under CITES, every other five years or so. Both environmental NGOs working in co-management of protected areas and the UMAs from municipalities near protected areas need resources to undertake qualitative monitoring,

which could then report to a central office. This information should be processed and interpreted to draw conclusion to serve as basis for regulations. Then this studies and regulation need to be disseminated, with care taken to avoid giving out details about specific nesting places, to deter poachers.

6.3 High-priority biodiversity conservation needs that lack donor or local support.

The identified high priority biodiversity conservation needs are built on requests made by current government and municipal officials, current NGO directors, university teachers and other experts that were visited. It reflects also information available from literature reviews, and apply the famous mandate to "keep it simple".

- From all stakeholders, more formal and informal environmental education projects focused on biodiversity and how to collaborate on biodiversity conservation. Better access to information for the general public, students, businessmen, and the scientific community, both national and international
- From all stakeholders, but particularly DAPVS, UNAH-DB, NGOs, and UMAs; the collection of additional and better quality scientific information about biodiversity; and improve monitoring of impacts on and changes in biodiversity from natural and man made disasters.
- From DAPSVS and University (UNAH-DB), research projects for CITES flora and fauna species and threatened ecosystems to measure and track changes in biodiversity. Support to expand and manage UNAH-DB natural history museum, because this is Biodiversity conservation begins[23].
- From DAPVS and DIGEPESCA, hunting dates information dissemination programs via the internet, publications, radio, TV, newspapers, etc.
- From municipalities-UMAs and DPAVS, training and technical assistance to UMAs, particularly for those municipalities that neighbor the 38 highest-priority protected areas (see annex # 2).
- From UNAH-DB, education and research programs for the subtropical dry forest ecosystem, focused on specific endangered species. In particular, the endemic species[24] (ex. Emerald Hummingbird).
- From NGOs, UMAs, Fishermen, and DIGEPESCA, training in non-destructive technologies for sustainable natural resource exploitation, for example the use turtle exclusion devices.
- From Fundacion Vida, funds to continue support to NGOs working in PAs management[25].

[23] Gustavo Cruz and Samuel Flores, UNAH-DB/Museaum.
[24] Pilar Thorn, UNAH-DB teacher and ornithologist.
[25] Jorge Quiñónez, director

- From UNAH, UPN, EPA, and other university centers financial resources so that professors can undertake biodiversity research through short term (weekend) trips to field sites with senior students[26].
- From DAPVS and UNAH, co-design and implementation of methodologies for increased qualitative and quantitative monitoring activities of threatened wildlife, possibly through exchange agreements with US scientists and US universities.
- From SERNA[27], creation of a Biodiversity Institute or alike, that maintains a cluster of permanent scientists and research projects, and is not affected by changes in government. Currently, the experts that collect and analyze field data tightly hold much information.
- From NGOs and UMAs, more community participation biodiversity conservation projects, for employment and income generation for families through activities such as iguana farms, sustainable harvest of wildlife for food, natural medicine, seeds harvesting, forest fires and fauna protection services, etc.
- From IHT[28], Dissemination and promotion of ecotourism materials, conservation programs, training in natural resources entrepreneurship, local "green stores" with "green products and services", etc.
- From DAPVS, support for recovery centers and training in rescuing and rehabilitating wildlife that have been captured or accidentally hurt for release and/or use in environmental education.
- From NGO's, UMAs and DAPVS, privatization of forest fire monitoring and control, and greater mobilization of brigades to fight fires. In addition, significant purchases of equipment for fighting forest fires.
- From ESNACIFOR/Lancetilla and NGOs, generation of communal and investment projects, such as the collection and sale of hardwood seeds and nursery production and sale of tree seedlings to private companies (e.g., furniture stores, lumber mills, etc.) and to the government for watershed reforestation (rather than depending on government-run tree nurseries).
- From UMAs, more resources for environmental information centers for tourists and residents to learn more about local natural resources and the value of conservation and rational exploitation.
- From UMAs, more recycling centers for proper solid waste management and more oxidation ponds for the treatment of domestic wastewater to reduce stream pollution.

[26] UNAH-DB and UPN-CCNN staff.
[27] Carlos Pineda Viceminister and Olvin Andino, Minister adviser at SERNA.
[28] Erasmo Sosa, Gerencia de Productos y Ecoturismo, IHT.

7. Forest management best practices currently being applied on public, municipal and private lands in Honduras, and recommendation for the continuation or modification of practices.

In 1992, the Law of Modernization and Development of the agricultural sector (No. 31-92), returned forest property to the people of Honduras and introduced a requirement for forest management plans. The law said: "*All cut or commercial forest use in public or private areas may only be carried out with the previous approval by AFE-COHDEFOR of a Management Plan prepared by the holders of the property*". Article #73 of the law also states that "*the Technical Norms and Regulations Department of AFE-COHDEFOR will develop, norms related to the conservation and protection of forest lands, whether forested or not, in all national, municipal, and private forest areas*". Since they went into effect in January of 2000, these norms have been disseminated through a number of seminars and training programs to introduce the role of forest management plans in rational forest use.

From biodiversity stand point, two primary management practices are applied to forested public, municipal, and private lands in Honduras: management plans for protected areas, and forest management plans for national, municipal, and private forestland.

The management plans for protected areas are generated case by case basis on every PA, by NGOs or assisted by DAPVS, following standardized outlines to end up with a master plan for each PA. Forest Management Plans are defined by AFE-COHDEFOR in the "Technical Norms and Regulations for the elaboration of forest management plans in coniferous forests, mixed forest and plantations". According to Johnston and Lorraine (1994, vol. 3, p.73), "management plans approved by COHDEFOR, generally are simple cutting plans that merely specify the volume of timber to be extracted. Moreover, COHDEFOR, is reportedly very lax in monitoring compliance with management plans and reforestation requirements. Over cutting is common". Within these two main practices, there are other equally important such as watershed management practices, reforestation, soil erosion prevention and control, forest fires prevention and control, forest pest prevention and control, etc. However, the forest management plans are the one that receives more attention because deals with the rational and sustainable use of forest ecosystems.

This Forest Management Plan document is a tool worth emphasizing, because together its components set the stage for forest regeneration that will, in a sustainable way, provide benefits indefinitely. These norms also establish the rights and responsibilities of the forest owners and of the individuals who prepare the management plans. General Environmental Law No. 104-93 includes forest management under the principle of biodiversity protection and sustainable yields, based on the presumption that property owners will adopt protective measures under a forest management plan and annual operating plans. The technical norms apply to all declared forestland at a

national level, whether small (50 hectares or less), medium (51 to 499 hectares) or large (greater than 500 hectares); and whether private, national or municipal.

Forest management plans are currently considered the best tool for sustainable forest practices in Honduras. The plans include three components: a macro plan, a five-year plan, and an annual operating plan. The macro plan consists of biophysical studies of the area; zoning the area; identifying sensitive areas that require protection; identifying water sources and infrastructure (houses, electric wires, roads, etc.); the final forest owner investment in implementing the plan and undertaking a forest inventory. The five-year plan establishes activities to be programmed over the following five-year period. The annual operating plan, on the other hand, includes an inventory of standing wood and existing infrastructure, as well as water source boundaries, and the identification of seed trees (future mother trees), trees to be harvested, and areas that require protection (such as forest on slopes 60% or more). In addition, the annual operating plan presents the total volume of commercial wood to be harvested, the permissible change to the annual, and the final best use of the forest.

Procedures for carrying out management plan involve hiring a certified forester, who will request the legal title and related documents for the property and take them to the regional administration unit of AFE-COHDEFOR to determine their validity. Once they are proven valid, the forester inspects the area to determine its current use. The forester then provides the owner with instructions about the technical norms, which will apply. Once the forester has prepared the management plan, it is reviewed by the administration unit of AFE-COHDEFOR to ensure compliance with all required technical and administrative norms. Then the Forest Management Office of COHDEFOR in Tegucigalpa approves the management plan, and implementation of the management plan begins.

The ideal procedures for forest management best practices would be as follows:

a) Environmental impact mitigation measures included in the management plan should be implemented. These measures guarantee that norms of standing timber sale and new forest access roads will be built according to the AFE-COHDEFOR manual; that old trees supporting wildlife habitats be left standing; and that legally declared protected areas which are part of the National System of Protected Areas (SINAPH), or areas that are already being utilized as community water sources be left intact.

b) Exploitation or use of the forest should comply with the amounts specified throughout the approved management plan, regardless of whether or not the area is inspected following cutting operations.

c) Evidence of forest regeneration should be readily apparent in the site after exploitation.

d) Forest owners should be sanctioned with steep fines or even imprisonment as stipulated by the Law for violating the forest management plan.

e) Communities that carry out forest protection actions in watersheds and forests should receive benefits in the form of employment, income, or other services.

f) The forest owner should make significant and proportionate contributions, to the municipality or local environmental NGO, to finance urgent forest management activities.

When the ideal procedures are compared with the current situation, it can be concluded that although the technical norms and regulations for forest management plans have been prepared and approved for sustainable and indefinite use, in practice, illegal uses of national, municipal and private forests continue (according to newspaper articles, radio and television reports; internal reports from regional offices of COHDEFOR; complaints from NGOs, community leaders, municipalities and international organizations). The damage to forests is estimated to be about 100,000 hectares per year, the main causes being fuel wood collection, urbanization, natural weather phenomena, agricultural and cattle industry expansion, forest fires and illegal exploitation (Country Environmental Profile of 1982, 1989 and 1997; DIBIO 2001 Baseline Biodiversity Study; and Honduran newspaper articles).

Thus, recommended modifications in forest management practices are as follows[29]:

a) Strengthen measures for mandatory site inspections of areas under forest management plans (and their annual and five-year components).

b) Apply sanctions to forest owners, forester responsible of making the plans and to Government officials who are responsible for including false or misleading information in forest management plans.

c) Continue training AFE-COHDEFOR personnel assigned to regional offices, in agroforestry and other sustainable practices appropriate for protected area buffer zones.

d) Disseminate to government authorities and the general public, written copies of the norms and procedures for preparation and approval of forest management plans. Provide authorization for Municipal and regional COHDEFOR officials to play key roles in the preparation, review, approval and inspection of forest management plans.

[29] There are more recommendation in the SERNA 1997 Environmental Profile; PLANFOR 1996 – 2015, published by COHDEFOR and SECPLAN in 1996 (vol. II and III); and others.

e) Improve mechanisms for supervision and inspection of compliance with approved forest management plans. Municipal officials and members of the Armed Forces should be trained and authorized to serve as auxiliary supervisors and report to AFE-COHDEFOR.

f) Train police and customs authorities in basic forestry, to recognize and distinguish among different types of sawed wood (visual observation, fiber, color, smell, etc.), and to recognize official AFE-COHEDFOR documentation.

g) Establish financial incentives for private forest owners, municipal officials, and NGO representatives, to promote natural forest regeneration and reforestation where appropriate, to practice fire protection, and to establish their own nurseries and produce tree seedlings. One incentive could be income and employment generation to rural families, and organized groups, including NGOs.

8. Recommendations to USAID/Honduras for consideration under the new Strategy in order to better meet the needs for biodiversity conservation and sustainable use of natural resources, including potential opportunities for USAID to contribute to biodiversity conservation through other strategic objectives.

In order to make recommendations, first we have to make conclusions about the current situation versus the desired situation in respect to conservation of the biodiversity.

8.1 The desired situation in respect to conservation of the biodiversity.

The desired situation by year 2025 and beyond[30] could be summarized in the following points:

8.1.1 Basic wildlife studies completed, including quantitative population studies on which to base qualitative monitoring programs for all of the 82 endangered and threatened species of flora and fauna that have been identified in different documents during the last decade (ex. CITES and country environmental profiles).

8.1.2 Biodiversity studies serve as the foundation for the formulation of policies, strategies and monitoring programs for conservation of the biodiversity by government, municipalities neighboring protected areas, protected area directors, ecotourism managers, and managers of businesses that use terrestrial and aquatic natural resources. Information is available to public through mass media, including web sites.

8.1.3 Authorizations and prohibitions for the use of terrestrial and aquatic resources are based on the results of permanent monitoring studies that assure the recovery of flora and fauna species in high demand.

8.1.4 Universities has increase the amount of basic and applied research on threatened flora and fauna species and are fully involved in making biodiversity conservation studies. There are agreements and strategic alliances, with US universities, and this contributes to the development of future professionals and serve as a source of information for the development of policies, strategies, and actions by the government, municipalities, NGOs, companies, specialized centers and the general public.

8.1.5 Education and environmental awareness about the importance of conserving biodiversity has increased among the public, and especially among central and municipal government officials, legislators, police and military responsible for ensuring the good use of natural resources.

[30] Stated in several documents such as PLANFOR 1996-2015 (SECPLAN and AFE-COHDEFOR); SERNA 1997 Environmental Profile; DIBIO 2001 Estudio Basico sobre Biodiversidad en Honduras; and others.

8.1.6 Environmental awareness has also increased among businessmen who depend upon natural resources and biodiversity for their income (e.g., shrimp, wild pets, etc.) allowing them to improve their productivity with respect to natural resources and increase their competitiveness in the market. "Green" business practices and certification.

8.1.7 Biodiversity research and species monitoring is done following scientifically sound and internationally accepted protocols and managed by an autonomous institution not affected by changes in government, nor by budget limitations, institutional reorganizations, slow and tedious administrative processes, and administrative and supervisory corruption.

8.1.8 There is collaboration and harmony among professionals dedicated to the conservation of the flora and fauna, be they biologists, foresters, agronomists, administrators or teachers. Teamwork among professionals and institutions has increased in benefit of conservation of biodiversity.

8.1.9 Institution in charge of monitoring impacts on and changes in biodiversity are well trained and equipped to do so, and mitigation measures are designed and implemented based on the results of permanent monitoring efforts.

8.1.10 Sustainable use of biodiversity is generating income for the benefit of the country and rural communities, particularly those neighboring ecosystems where resources are being used. This income is generated with the certainty that the biodiversity of Honduras is being maintained and not threatened with destruction "*that the sustainable use of biodiversity feeds the poor and needy instead of serving as food to the poor and needy.*" By the same token, "*biodiversity should support social welfare and economic growth, but to the extent that we all pay the high price of losing biodiversity forever."*

8.2 The current situation in respect to conservation of the biodiversity.

Based on a review of the literature and consultations with experts and officials from the government, universities, NGOs, and municipalities, this report finds that the current biodiversity conservation situation in Honduras can be defined as follows:

8.2.1 The conservation of biodiversity in Honduras is regulated by a number of government offices, such as SERNA/DIBIO, AFE-COHDEFOR/DAPVS, and SAG/DIGEPESCA-DICTA, and is carried out under numerous projects within those offices, such as PAAR, PROBAP, MARENA, PMAIB, etc. Many NGOs, universities, private businesses (e.g., tour operators, tourist centers, hotels, etc.), and even private citizens (conservationists) are involved in biodiversity conservation in Honduras. This situation makes coordination efforts a very difficult task.

8.2.2 Biodiversity monitoring in Honduras is focused on 38 of the highest-priority protected areas more than on particular threatened flora and fauna species, such as those 82 fauna species listed in CITES.

8.2.3 No one is carrying out quantitative monitoring of the population status of threatened species of flora and fauna, not the responsible government offices, nor NGOs, universities, or international environmental organizations. Isolated qualitative activities, mostly visual qualitative monitoring observations, are carried out in terrestrial ecosystems, primarily by park rangers and groups of bird lovers volunteers (Pilar Thorn and Gustavo Cruz/UNAH-BD personal communication). With respect to aquatic ecosystems, ineffective methods exist to verify type of nets used and the amount and size of fish captured, and these methods are used only sporadically (Mario Castellón DIGEPESCA's director, Rigoberto Gonzalez Head DIGEPESCA Planning and Luis Morales DIGEPESCA-Research, personal communication).

8.2.4 Government offices in charge of carrying out research and monitoring of biodiversity (e.g., AFE-COHDEFOR/DAPVS and DIGEPESCA) lack the human, logistical, and financial resources to undertake inventories of wild fauna, to register wildlife kept as pets, etc., much less to monitor threatened species of flora and fauna. Policies are formulated without having sound scientific evidences to support their decisions (1982, 1989 and 1997 country environmental profiles). Forest management plans lack effective and acceptable field supervision, which allows open violation of terms in detriment of wildlife (1997 country environmental profile; Conrado Gonzalez, DAPVS head and Carlos Sandoval, Forest Management head at COHDEFOR).

8.2.5 NGOs also lack sufficient means, financial as well as human and technological, to design and carry out basic research and monitoring for threatened species of flora and fauna[31].

8.2.6 Universities, both state-owned and private, carry out sporadic biodiversity research and monitoring activities focused on threatened species of flora and fauna (ex. Lic. Carlos Cerrato, Dr. Gustavo Cruz and Pilar Thorn, UHAH/DB, personal communication). Although these activities are carried out with limited resources under individual initiative and funds, they still have better methodology and scientific rigor than projects carried out outside of a university (Dr. Gustavo Cruz, UHAH/DB, personal communication). There is no monitoring of impacts on and changes in biodiversity due to natural and man made disasters.

8.2.7 Municipal environmental units (UMAs) generally are managed by personnel whose academic level, experience, and resource limitations do not allow them to design studies, or undertake scientific monitoring in order to understand the impact of local activities on threatened flora and fauna species in their respective municipalities.

[31] Fundación Vida and NGOs annual reports; 1982, 1989 and 1997 country environmental profile.

8.2.8 Some private business are involved in Biodiversity conservation, directly and indirectly through NGOs, mostly through environmental education and nursery development for reforestation programs (i.e. “Cerveceria Hondureña, S. A.” a brewery company nursery program; a joint effort of “ALCON, S. A.” a food company; “Azucarera Hondureña, S. A.” a group of sugar mill companies and “Chiquita Banana” Tela Railroad company environmental education radio programs, etc.). However, this individual or joint participation in favor of biodiversity and environment are only sporadic. Majority of business does not even comply with environmental mitigation plans to be environmentally licensed to operate.

8.2.9 Competition, claims of corruption, negative criticism, personal enmity, and claims of ownership over field data and research sites among natural resources professionals (involved as managers, administrators, field biologists, field foresters, field agronomists, etc.) cause problems to the detriment of conservation (private and public knowledge though professional annual meetings, main local newspapers, radio and TV news).

8.2.10 Basic studies and species monitoring are vulnerable to changes in governments and high turn-over of government personnel, as well as to budget cuts, inefficient government processes, and institutional reorganizations. For example, the local press is already speculating that when COHDEFOR is transformed into a new Forest Service (SEFONAC), hundreds of current COHDEFOR employees at the national level will be let go. Corruption in the administration of processes such as forest management plans, marine resources exploitation permits, and wildlife permits makes biodiversity conservation extremely difficult (private and public knowledge though main local newspapers, radio and TV news).

8.2.11 Formal and non-formal environmental education programs are present in formal at school and university level, and in all official natural resources management programs. Nevertheless, although better than ten years ago, still a lot more needs to be done to improve environmental awareness among governmental officials, municipalities, legislators, universities, businessmen, police and general public.

8.2.12 About the Equal Distribution of Conservation Benefits policy, stated by DIBIO, is an excellent initiative, but its implementing strategies are not clear. Use of biodiversity is generating non-sustainable benefits to the country (i.e. timber, wildlife, aquatic species, etc.) and minimum benefits to rural communities (i.e. temporary jobs as workers), particularly those that are neighboring ecosystems where resources are being used. Biodiversity is being used directly as food or cash crop or destroyed because it is a threat to human safety and domestic animals.

8.3 Recommendations to USAID, to be considered under the new Strategy, to better meet the needs for biodiversity conservation and sustainable uses of natural resources.

As a result of the preceding conclusions, and including social and economic aspects in addition to purely ecological considerations, as well as the desired situation, the following recommendations should be considered by the USAID Mission in their new strategy:

(*)[32] 8.3.1 Support existing and create more environmental education programs, formal and non formal, primarily oriented to governmental officials, municipalities, legislators, universities, businessmen, police and general public.

(*) 8.3.2 Support the establishment of an Institute of Biodiversity, either for Honduras or for Central America, that could contribute to monitoring of flora and fauna, following scientifically sound and internationally accepted protocols. Also to conduct basic studies to support policies and recommend sustainable use of biodiversity for national welfare and economic growth, and in benefit of rural communities.

8.3.3 Additional support in the form of training and logistics be given to government institutions responsible for policy making and oversight of use of natural resources, to ensure compliance with their own organic laws, (e.g. DIGEPESCA, DAPVS, DIBIO, etc.).

(*) 8.3.4 Provide more training to personnel in the UMAs to assist them in working more efficiently in conservation and sustainable use of biodiversity, in alliances with NGOs responsible for protected areas. In this way, the UMAs would be better trained to meet the needs of investors and entrepreneurs, whose investments depend on natural resources as raw material for their industries, e.g., lumber mills, textile factories, tour operators, etc.

(*) 8.3.5. Support institutional strengthening of NGOs to design and implement monitoring programs of threatened species of flora and fauna, in strategic alliances and contracts with national and international university research centers.

(*) 8.3.6 Support DIGEPESCA in assisting commercial fishing companies to become more productive and sustainable, and for DIGEPESCA to improve monitoring and protection of marine resources, in alliance with national and international universities and associated scientists, to ensure scientific validity of their monitoring programs.

8.3.7. Support DIBIO, DAPVS and DIGEPESCA in more effective supervision of compliance with regulations and authorized quotas for sustainable use of wild fauna (terrestrial as well as aquatic), in alliance with municipalities and the Armed Forces.

[32] (*) = Suggested priority.

Also, provide resources to facilitate dissemination of such regulations (ex. Hunting dates for specific fauna; regulations on flora exploitation, etc.).

(*) 8.3.8 Sponsor studies of wildlife species and monitoring of techniques used for capturing wildlife, in support of international certifications, and to improve competitiveness of businesses using natural resources (terrestrial and aquatic biodiversity), and market placement of their products.

(*) 8.3.9 Support community-based rural projects, which increase family income through sustainable use of biodiversity, such as rural tourism, ecotourism guides, bird watchers, small mountain hotels, zoo farms, etc.

(*) 8.3.10 Facilitate alliances between academic institutions of higher education, such as national and international universities and biodiversity institutes, through exchanges of staff, experiences and methodologies, in the field of sustainable management of biodiversity.

(*) 8.3.11 Facilitate investment by environmentally-responsible companies in scientifically-based natural resources use, such as tour operators working under sustainable carrying capacity guidelines, and which also create local community benefits.

8.3.12. Support alliances between international environmental organization and local NGOs, universities or municipalities, oriented to specific special interest conservation goals and for specific species of flora and fauna. Provide support for monitoring infrastructure development and training.

8.3.13. Support graduate degree programs in natural resources conservation-related subject fields, with an emphasis on biodiversity monitoring, under alliances between local and international universities. The scholarship program should include job placement actions following graduation.

(*) 8.3.14 Support the state-owned local universities, e.g., UNAH and the UNPFM, so that properly qualified and experienced professors, may carry out basic studies on population conditions of threatened species of flora and fauna and their ecosystems. The studies should also include design and implementation of qualitative monitoring for the CITES species (flora and fauna). This can be done under alliances with regional and U.S. universities, to exchange information and provide in-service training or for graduate theses.

8.3.15 Lets continue to seek financial incentives oriented to invite private sector to invest more in biodiversity conservation for sustainable development. Give the incentives more promotion among private sector, to encourage general managers to participate in sponsoring biodiversity conservation programs. Work harder in designing

a strategy on how to really make poor rural communities neighboring protected areas, benefit directly from biodiversity conservation, by means of income, employment, cash benefits from products or services, etc.

Note: See also section 6.3 for actual stakeholders suggested needs that lack donor.

Annexes

#1. Biodiversity in Honduras in Numbers.

Ecosystems	3 out of 5 in Latin American (Dinerstein et al.)
Terrestrial Ecosystems	8 Life Zones Holdridge et al.
Terrestrial Habitats	11 (Dinerstein et al.)
Terrestrial Habitats	50 a 70 UNESCO/CATIE/PAAR House, UNAH, 2002
Coastal-marine Ecosystems (including coral reefs)	26 Salm and Clark, (1984), Gomez (1984) and PNUD/GEF (1996).
Freshwater Ecosystems (rivers, lakes, lagoons, etc.)	Not yet registered.
Marine macro Algae	81 species
Freshwater Algae	2 species
Plants (vascular registered)	7,524 species (Molina and Nelson, 2002)
Plants (vascular endemics registered)	244 endemic species (Molina and Nelson, 2002)
Insects (registered)	2,500 Registered species.
Insects (potential number not registered yet)	30 to 50,000 potential species. (Cave et al., EAP)
Freshwater fish	88 species Martin et al. (1972)
Marine Fish	194 species (Atlantic) (RIMS, 1999) 390 species (Pacific) (FAO, 1995)
Amphibians	111 species 36 endemic species Wilson and McCline, 2001
Reptiles	211 species 15 endemic species Espinal and Castañeda, 2001
Birds	717 species 1 endemic species (emerald hummingbird) Thorn, 2002
Mammals	228 species (98 are bat species). 6 endemic species Martinez and Marineros, 2000.

Source: DIBIO. 2001. Estudio de Diversidad Biológica en Honduras; Informe 2000 .SERNA.

#2 List of 38 High-Priority Protected Areas and Neighboring Municipalities.

High priority protected areas and neighboring Municipalities [33]. Adapted from COHDEFOR by Jaime Bustillo and Suyapa Dominguez, Nov 20, 2002

Protected area	Departamento(s)	Municipality(ies)	Category[34]
1. Patuca	Olancho and Gracias A Dios	Catacamas and Wampusirpi	NP
2. Warunta	Gracias a Dios	Puerto Lempira and Ahuas	NP
3. Capiro Calentura[35]	Colon	Trujillo	NP
4. Pico Pijol	Yoro	Morazán	NP
5. Pico Bonito	Atlántida	La Ceiba, Arizona, El Porvenir and La Masica.	NP
6. Jeannette Kawas (Punta Sal) and Punta Izopo	Atlántida	Tela and Arizona	NP
7. Sierra de Agalta	Olancho	Catacamas	NP
8. La Muralla	Olancho	La Unión	NP
9. Cusuco	Cortes	San Pedro Sula	NP
10. Santa Bárbara Mt.	Santa Bárbara	Santa Bárbara	NP
11. Celaque Mt.	Lempira, Copan and Ocotopeque	Belén Gualcho, Gracias, La Campa, San Manuel Colohete, San Juan de Opoa y Santa Rosa.	NP
12. Yoro Mt.	Yoro	Yoro	NP
13. La Tigra	Francisco Morazán	Tegucigalpa DC.	NP
14. Montecillos	La Paz, Comayagua and Intibuca.	La Paz, Santiago Puringla; Lejamaní, Ajuterique, Comayagüa; Sigüatepeque, Mazagüara and Jesús de Otoro.	NP
15. Cerro Azul Meambar	Cortes and Comayagüa	Taulabé and Santa Cruz de Yojoa.	NP
16. Puca Opalaca Mt.	Intibuca and Lempira.	Intibuca, San Francisco de Opalaca and San Juan; Gracias, Belén, La Iguala, and San Rafael.	NP
17. Montecristo Trifinio	Ocotepeque	Nueva Ocotepeque	NP
18. El Arenal	Yoro	Arenal	WR
19. Botaderos	Colon	Sabá and Tocoa.	WR
20. Río Kruta (Llanos de Auca)	Gracias a Dios	Villeda Morales	WR
21. Barras del Río Cuero y Salado	Atlántida	El Porvenir, La Masica, Esparta and San Francisco	WR
22. Laguna de Caratasca	Gracias a Dios	Puerto Lempira	WR

[33] COHDEFOR/DAPVS-PROBAP proposed the 38 PAs, the authors identified the potential municipalities.
[34] Some categories and areas are not official just proposed.
[35] Lagoons Wildlife Refuge included joined with Capiro Calentura NP as one single protected area, in Trujillo, Colon.

Protected Area	Departament(s)	Municipality(ies)	Category
23. Fonseca Gulf Areas	Valle and Choluteca	Alianza, Nacaome, Amapala, San Lorenzo; Marcovia and Namasigue.	WR
24. Texiguat	Atlántida and Yoro.	Yoro and Arizona	WR
25. Montaña Verde (Cerro Jilinco)	Santa Barbara, Intibuca and Lempira.	San Francisco de Opalaca and SanJuan; San Francisco de Ojuera; La Iguala, La Union and San Rafael.	WR
26. Rus Rus	Gracias a Dios	Puerto Lempira	BR
27. Lago de Yojoa	Cortes, Comayagua, Santa Bárbara	Santa Cruz de Yojoa, Las Vegas and Taulabé.	Múltiple Use
28. El Chile	Francisco Morazán and El Paraíso	Villa de San Francisco and Morocelí.	BR
29. Guanacaure	Choluteca	Choluteca	BR
30. Lancetilla	Atlántida	Tela	Botanical Garden
31. Cuevas de Taulabé	Comayagua	Taulabé	Natural Monument
32. Cayos Cochinos	Islas de la Bahía	Roatan	MR
33. Utila	Islas de la Bahía	Utila	MR
34. Guanaja	Islas de la Bahía	Guanaja	MR
35. Roatan	Islas de la Bahía	Roatan	MR
36. Islas del Cisne	Islas de la Bahía	Roatan	MR
37. Río Plátano	Gracias a Dios	Juan Francisco Bulnes and Brus Laguna.	Biosfera Reserve
38. Tawahka	Olancho and Gracias a Dios	Catacamas, Dulce Nombre de Culmí; Wampusirpi	Biosfera Reserve

Notes:

(1) NP= National Park WR= Wildlife Refuge BR= Biological Reserve
(2) There are an estimated 61 municipalities neighboring the selected 38 high priority protected areas (proposed and legal).

#3 CITES List of threatened Flora in Honduras.

Order: BROMELIALES
Family: BROMELIACEAE
Species:

1.	Tillandsia kammii Rauh

Order: CARYOPHYLLALES
Family: CACTACEAE
Species:

2.	Disocactus aurantiacus
3.	Heliocereus aurantiacus Kimnach
4.	Rhipsalis baccifera (J. Miller) Stearn ssp. baccifera
5.	Rhipsalis baccifera (J. Miller) Stearn
6.	Disocactus biformis (Lindley in Edwards) Lindley
7.	Disocactus cinnabarinus
8.	Heliocereus cinnabarinus
9.	Opuntia cochenillifera (L.) Miller
10.	Mammillaria columbiana Salm-Dyck ssp. yucatanensis
11.	Mammillaria columbiana Salm-Dyck
12.	Epiphyllum crenatum (Lindley) G. Don
13.	Melocactus curvispinus Pfeiffer ssp. curvispinus
14.	Melocactus curvispinus Pfeiffer
15.	Opuntia deamii Rose
16.	Opuntia decumbens Salm-Dyck
17.	Stenocereus eichlamii
18.	Mammillaria eichlamii
19.	Selenicereus grandiflorus (L.) Britton & Rose
20.	Epiphyllum guatemalense
21.	Opuntia guatemalensis Britt. & Rose
22.	Nopalea guatemalensis
23.	Opuntia hondurensis
24.	Selenicereus hondurensis
25.	Epiphyllum hookeri Haw.
26.	Pereskiopsis kellermanii
27.	Selenicereus kunthianus (Otto) Britton & Rose
28.	Pachycereus lepidanthus
29.	Pilosocereus leucocephalus Britton & Rose
30.	Opuntia lutea

31. Nopalea lutea
32. Pereskia lychnidiflora DC.
33. Selenicereus macdonaldiae
34. Wilmattea minutiflora Britton & Rose
35. Hylocereus minutiflorus Britton & Rose
36. Disocactus nelsonii (Britton & Rose) Lindinger
37. Epiphyllum oxypetalum
38. Acanthocereus pentagonus (L.) Britton & Rose
39. Epiphyllum phyllanthus (L.) Haw. var. hookeri (Haw.) Kimnach
40. Pseudorhipsalis ramulosa
41. Mammillaria ruestii
42. Selenicereus testudo
43. Acanthocereus tetragonus (L.) Hummelinck
44. Epiphyllum thomasianum (Schumann) Britton & Rose
45. Epiphyllum thomasianum (Schumann) Britton & Rose var. thomasianum
46. Mammillaria voburnensis ssp. eichlamii
47. Mammillaria voburnensis
48. Cereus yunckeri

Order : CARYOPHYLLALES

Family: CYATHEACEAE

49. Cyathea bicrenata Liebm.
50. Cyathea costaricensis (Kuhn) Domin
51. Cyathea divergens Kunze var. tuerckheimii (Maxon) R. Tryon
52. Cyathea excelsa O. Swartz
53. Alsophila firma (Baker) Conant
54. Cyathea fulva (Martius & Galeotti) Fée
55. Sphaeropteris horrida (Liebm.) Tryon
56. Cyathea lucida (Fee) Domin
57. Cyathea mexicana Schltr. & Cham.
58. Trichipteris mexicana (Mart.) Tryon
59. Cyathea microdonta (Desv.) Domin
60. Cyathea multiflora Smith
61. Cyathea myosuroides (Liebm.) Domin
62. Cyathea princeps E. Mayer
63. Cyathea salvinii (Hook.) Domin
64. Alsophila salvinii Hooker

65.	Trichipteris scabriuscula (Maxon) R. Tyron
66.	Cyathea schiedeana (C. Presl) Domin
67.	Cyathea tryoniana Gastony
68.	Alsophila tryoniana (Gastony) Conant
69.	Cyathea ursina (Maxon) Lellinger
70.	Cyathea valdecrenata Domin

Family: DICKSONIACEAE
Species:

71.	Culcita coniifolia (Hook.) Maxon
72.	Dicksonia gigantea Karst.
73.	Lophosoria quadripinnata (Gmelin) C. Chr.
74.	Cibotium regale Versch. & Lem.

Order : FAGALES
Family: FAGACEAE
Species:

75.	Quercus copeyensis C.H. Mull.

Order : FABALES
Family: LEGUMINOSAE
Species:

76.	Cynometra hemitomophylla (Donn. Sm.) Britton & Rose
77.	Platymiscium pleiostachyum Donn. Sm.

Order : SAPINDALES
Family: MELIACEAE
Species:

78.	Swietenia humilis Zuccarini

Order : ORCHIDALES
Family: ORCHIDACEAE
Species:

79.	Encyclia abbreviata (Schltr.) Dressler
80.	Lepanthes acuminata Schltr.
81.	Maxillaria alba (Hook.) Lindley
82.	Pleurothallis allenii L.O. Williams
83.	Laelia anceps Lindley
84.	Osmoglossum anceps Schltr.
85.	Lepanthes appendiculata Ames
86.	Mormodes aromatica Lindley
87.	Lycaste aromatica (Graham) Lindley
88.	Encyclia atrorubens (Rolfe) Schltr.

89.	Cattleya aurantiaca (Bateman ex Lindley) P.N. Don.
90.	Encyclia baculus (Reichb.f.) Dressler & Pollard
91.	Galeandra batemanii Rolfe
92.	Coelia bella (Lemaire) Reichb.f.
93.	Macroclinium bicolor (Lindley) Dodson
94.	Lacaena bicolor Lindley
95.	Trichosalpinx blaisdellii (S.Watson) Luer
96.	Pleurothallis blaisdellii S.Watson
97.	Encyclia boothiana (Lindley) Dressler var. erythronioides (Smith) Luer
98.	Macradenia brassavolae Reichb.f.
99.	Encyclia brassavolae (Reichb.f.) Dressler
100.	Pleurothallis cardiochila L.O. Williams
101.	Epidendrum cardiochilum L.O. Williams
102.	Elleanthus caricoides Nash
103.	Phragmipedium caudatum (Lindley) Rolfe
104.	Epidendrum chloe Reichb. F.
105.	Stelis cleistogama Schltr.
106.	Epidendrum cnemidorphorum Lindley
107.	Encyclia cochleata (L.) Dressler
108.	Lycaste cochleata Lindley
109.	Epidendrum cochleatum L.
110.	Pleurothallis comayaguensis Ames
111.	Stelis conmixta Schltr.
112.	Rhynchostele cordata (Lindley) Soto Arenas & Salazar
113.	Lemboglossum cordatum (Lindley) Halbinger
114.	Encyclia cordigera (Kunth) Dressler
115.	Epidendrum coriifolium Lindley
116.	Amparoa costaricensis Schltr.
117.	Oncidium crista-galli Reichb.f.
118.	Maxillaria cucullata Lindley
119.	Epidendrum cystosum Ames
120.	Cattleya deckeri Klotzsch
121.	Pleurothallis deragularis (Barb. Rodr.) Luer
122.	Rhyncholaelia digbyana (Benth.) Schltr.
123.	Epidendrum dilochioides L.O. Williams
124.	Epidendrum eburneum Reichb.f.

125.	Stanhopea ecornuta Lem.
126.	Cycnoches egertonianum Bateman
127.	Pleurothallis endotrachys Reichb.f.
128.	Oncidium ensatum Lindley
129.	Comparettia falcata Poeppig & Endl.
130.	Masdevallia floribunda Lindley
131.	Lepanthopsis floripecten (Reichb.f.) Ames
132.	Xylobium foveatum (Lindley) Nicholson
133.	Scaphyglottis graminifolia (Ruiz Lopez & Pavon) Poeppig & End.
134.	Elleanthus graminifolius (Barb. Rodr.) Lojtnant
135.	Rossioglossum grande (Lindley) Garay & Kennedy
136.	Mendoncella grandiflora (A. Rich) A. Hawkes
137.	Galeottia grandiflora A. Rich.
138.	Stanhopea graveolens Lindley
139.	Platystele halbingeriana (Schultes) Garay
140.	Oncidium hastatum (Bateman) Lindley
141.	Dresslerella hispida (L.O. Williams) Luer
142.	Campylocentrum hondurense Ames
143.	Lepanthes hondurensis Ames
144.	Deiregyne hondurensis (Schltr.) Schltr.
145.	Mormodes igneum Lindley & Paxt.
146.	Lepanthes inaequiloba Ames & C. Schweinf.
147.	Cypripedium irapeanum Llave & Lex.
148.	Ornithocephalus lankesteri Ames
149.	Restrepia lankesteri Ames & C. Schweinf.
150.	Lycaste lasioglossa Reichb.f.
151.	Pleurothallis leucantha Schltr.
152.	Oncidium leucochilum Bateman ex Lindley
153.	Oncidium lindenii Brogn.
154.	Encyclia linkiana (Klotzsch) Schltr.
155.	Cryptarrhena lunata R. Br.
156.	Coelia macrostachya Lindley
157.	Brassia maculata R. Br
158.	Maxillaria maleolens Schltr.
159.	Encyclia microbulbon (Hook.) Schltr.
160.	Scaphosepalum microdactylum Rolfe

161.	Sobralia mucronata Ames & C. Schweinf.
162.	Maxillaria nasuta Reichb.f.
163.	Brassavola nodosa (L.) Lindley
164.	Oncidium ochmatochilum Reichb.f.
165.	Myoxanthus octomerioides (Lindley) Luer
166.	Stanhopea oculata (Lodd.) Lindley
167.	Bulbophyllum oerstedii (Reichb.f.) Hemsley
168.	Lockhartia oerstedii Reichb.f.
169.	Oncidium ornithorrhynchum Kunth
170.	Epidendrum parkinsonianum Hooker
171.	Stelis parvula Lindley
172.	Miltonioides pauciflora (L.O. Williams) Hamer & Garay
173.	Notylia pentachne Reichb.f.
174.	Stelis perplexa Ames
175.	Vanilla pfaviana Rchb. f.
176.	Teuscheria pickiana (Schltr.) Garay
177.	Spiranthes polyantha Reichenb. f.
178.	Vanilla pompona Scheide
179.	Scaphyglottis prolifera Cogn.
180.	Osmoglossum pulchellum (Bateman ex Lindley) Schltr.
181.	Stelis purpurascens A. Rich & Galeotti
182.	Psygmorchis pusilla (L.) Dodson & Dressler
183.	Dracula pusilla (Rolfe) Luer
184.	Epidendrum puteum Standley & L.O. Williams
185.	Pleurothallis quadrifolia (Llave & Lex.) Lindley
186.	Lemboglossum rossii (Lindley) Halbinger
187.	Rhynchostele rossii (Lindley) Soto Arenas & Salazar
188.	Laelia rubescens Lindley
189.	Maxillaria rufescens Lindl. var. rufescens
190.	Pleurothallis ruscifolia (Jacq.) R.Br.
191.	Lepanthes samacensis Ames
192.	Ionopsis satyrioides (Sw.) Reichb. f.
193.	Oncidium sawyeri L.O. Williams
194.	Leochilus scriptus (Scheidw.) Reichb.f.
195.	Encyclia selligera (Lindley) Schltr.
196.	Cattleya skinneri Bateman

197.	Lycaste skinneri (Bateman ex Lindley) Lindley
198.	Epidendrum smaragdimum Lindley
199.	Encyclia spatella (Reichb.f.) Schltr.
200.	Coryanthes speciosa (Lodd.) Lindley
201.	Epidendrum stamfordianum Bateman
202.	Aspidogyne stictophylla (Schltr.) Garay
203.	Schomburgkia superbiens (Lindley) Rolfe
204.	Oncidium suttoni Bateman ex Lindley
205.	Maxillaria tenuifolia Lindley
206.	Spiranthes torta (Thunb.) Garay & Sweet
207.	Dichaea trichocarpa (Sw.) Lindl.
208.	Gongora truncata Lindley
209.	Xylobium tuerckheimii Kranzlin
210.	Scelochilus tuerckheimii Schltr.
211.	Masdevallia tuerckheimii Ames
212.	Encyclia vagans (Ames) Dressler
213.	Cycnoches ventricosum Bateman
214.	Platythelys venustula (Ames) Garay
215.	Brassia verrucosa Lindley
216.	Epidendrum viejii Reichb.f.

Source: www.Cites.org

#4. CITES List of threatened Fauna species in Honduras.

Phylum: CHORDATA
Class: AVES
Order: FALCONIFORMES
Family: ACCIPITRIDAE
Species:

1.	Buteo albicaudatus Vieillot, 1816
2.	Leucopternis albicollis (Latham, 1790)
3.	Buteo albonotatus Kaup, 1847
4.	Buteogallus anthracinus (Deppe, 1830)
5.	Accipiter bicolor (Vieillot, 1817)
6.	Harpagus bidentatus (Latham, 1790)
7.	Buteo brachyurus Vieillot, 1816
8.	Geranospiza caerulescens (Vieillot, 1817)
9.	Leptodon cayanensis (Latham, 1790)
10.	Accipiter chionogaster (Kaup, 1852)
11.	Accipiter cooperii (Bonaparte, 1828)
12.	Circus cyaneus (Linnaeus, 1766)
13.	Elanoides forficatus (Linnaeus, 1758)
14.	Morphnus guianensis (Daudin, 1800)
15.	Harpia harpyja (Linnaeus, 1758)
16.	Buteo jamaicensis (Gmelin, 1788)
17.	Elanus leucurus (Vieillot, 1818)
18.	Buteo magnirostris (Gmelin, 1788)
19.	Spizastur melanoleucus (Vieillot, 1816)
20.	Ictinia mississippiensis (Wilson, 1811)
21.	Busarellus nigricollis (Latham, 1790)
22.	Spizaetus ornatus (Daudin, 1800)
23.	Asturina plagiata Schlegel, 1862
24.	Buteo platypterus (Vieillot, 1823)
25.	Ictinia plumbea (Gmelin, 1788)
26.	Leucopternis semiplumbea Lawrence, 1861
27.	Rostrhamus sociabilis (Vieillot, 1817)
28.	Harpyhaliaetus solitarius (Tschudi, 1844)
29.	Accipiter striatus Vieillot, 1807
30.	Buteogallus subtilis (Thayer & Bangs, 1905)

31.	Buteo swainsoni Bonaparte, 1838
32.	Spizaetus tyrannus (Wied, 1820)
33.	Chondrohierax uncinatus (Temminck, 1822)
34.	Chondrohierax uncinatus CITES Appendix II populations
35.	Parabuteo unicinctus (Temminck, 1824)
36.	Buteogallus urubitinga (Gmelin, 1788)

Phylum: CNIDARIA
Class: ANTHOZOA
Order: SCLERACTINIA
Family: ACROPORIDAE
Species:

37.	Acropora cervicornis (Lamarck, 1816)
38.	Acropora palmata (Lamarck, 1816)
39.	Acropora prolifera (Lamarck, 1816)

Family: AGARICIIDAE
Species:

40.	Agaricia agaricites (Linnaeus, 1758)
41.	Helioseris cucullata (Ellis & Solander, 1786)
42.	Agaricia humilis Verrill, 1901
43.	Agaricia lamarcki Milne Edwards and Haime, 1851
44.	Agaricia tenuifolia Dana, 1846

Phylum: CHORDATA
Class: MAMMALIA
Order: RODENTIA
Family: AGOUTIDAE
Species:

45.	Agouti paca (Linnaeus, 1766)

Class: REPTILIA
Order: CROCODYLIA
Family: ALLIGATORIDAE
Species:

46.	Caiman crocodilus (Linnaeus, 1758)
47.	Caiman crocodilus (Cope, 1868) ssp. fuscus
48.	Caiman crocodilus CITES Appendix II populations

Class: AVES
Order: ANSERIFORMES
Family: ANATIDAE

Species:

49.	Dendrocygna autumnalis (Linnaeus, 1758)
50.	Dendrocygna bicolor (Vieillot, 1816)
51.	Cairina moschata (Linnaeus, 1758)

Phylum:: CNIDARIA
Class: ANTHOZOA
Order: ANTIPATHARIA
Family: ANTIPATHIDAE
Species:

52.	Antipathes lenta Pourtalès, 1871
53.	Antipathes umbratica Opresko, 1996

Order: SCLERACTINIA
Family: ASTROCOENIIDAE

54.	Stephanocoenia intersepta (Esper, 1795)

Phylum: CHORDATA
Class:: REPTILIA
Order: SERPENTES
Family: BOIDAE

Species:

55.	Corallus annulatus (Cope, 1875)
56.	Boa constrictor Linnaeus, 1758
57.	Boa constrictor CITES Appendix II populations

Class: MAMMALIA
Order: XENARTHRA
Family: BRADYPODIDAE
Species:

58.	Bradypus variegatus Schinz, 1825

Phylum: CNIDARIA
Class: ANTHOZOA
Order: SCLERACTINIA
Family: CARYOPHYLLIIDAE
Species:

59.	Caryophyllia ambrosia Cairns, 1999 ssp. caribbeana
60.	Coenosmilia arbuscula Pourtalès, 1874
61.	Deltocyathus calcar Pourtalès, 1874
62.	Coenocyathus caribbeana Cairns, 2000
63.	Stephanocyathus coronatus (Pourtalès, 1867)
64.	Cladocora debilis Milne Edwards and Haime, 1849
65.	Deltocyathus eccentricus Cairns, 1979
66.	Eusmilia fastigiata (Pallas, 1766)
67.	Phacelocyathus flos (Pourtalès, 1878)
68.	Colangia immersa Pourtalès, 1871
69.	Colangia jamaicaensis Cairns, 2000
70.	Stephanocyathus paliferus Cairns, 1977
71.	Paracyathus pulchellus (Philippi, 1842)
72.	Trochocyathus rawsonii Pourtalès, 1874
73.	Thalamophyllia riisei (Duchassaing & Michelotti, 1860)
74.	Oxysmilia rotundifolia (Milne Edwards & Haime, 1848)

Phylum: CHORDATA
Class: AVES
Order: FALCONIFORMES
Family: CATHARTIDAE
Species:

75.	Sarcoramphus papa (Linnaeus, 1758)

Class: MAMMALIA
Order: PRIMATES
Family: CEBIDAE

Species:

76.	Cebus capucinus (Linnaeus, 1758)
77.	Ateles geoffroyi Kuhl, 1820
78.	Ateles geoffroyi CITES Appendix II populations
79.	Alouatta palliata (Gray, 1849)

Class: REPTILIA

Order: TESTUDINATA

Family: CHELONIIDAE

Species:

80.	Caretta caretta (Linnaeus, 1758)
81.	Eretmochelys imbricata (Linnaeus, 1766)
82.	Chelonia mydas (Linnaeus, 1758)
83.	Lepidochelys olivacea (Eschscholtz, 1829)

Class: AVES

Order: CICONIIFORMES

Family: CICONIIDAE

Species:

84.	Jabiru mycteria (Lichtenstein, 1819)

Class: REPTILIA

Order: SERPENTES

Family: COLUBRIDAE

Species:

85.	Clelia clelia (Daudin, 1803)

Class: AVES

Order: GALLIFORMES

Family: CRACIDAE

Species:

86.	Penelope purpurascens Wagler, 1830
87.	Crax rubra Linnaeus, 1758
88.	Ortalis vetula (Wagler, 1830)

Class: REPTILIA

Order: CROCODYLIA

Family: CROCODYLIDAE

Species:

89.	Crocodylus acutus (Cuvier, 1807)

Class: MAMMALIA

Order: RODENTIA

Family: DASYPROCTIDAE

Species:

90.	Dasyprocta punctata Gray, 1842

Order: CETACEA
Family: DELPHINIDAE
Species:

91.	Stenella attenuata (Gray, 1846)
92.	Steno bredanensis (Lesson, 1828)
93.	Stenella clymene (Gray, 1846)
94.	Stenella coeruleoalba (Meyen, 1833)
95.	Delphinus delphis Linnaeus, 1758
96.	Stenella frontalis (G. Cuvier, 1829)
97.	Stenella longirostris (Gray, 1828)
98.	Tursiops truncatus (Montagu, 1821)

Phylum: CNIDARIA
Class: ANTHOZOA
Order: SCLERACTINIA
Family: DENDROPHYLLIIDAE
Species:

99.	Tubastraea coccinea Lesson, 1829
100.	Rhizopsammia goesi (Lindström, 1877)
101.	Balanophyllia grandis Cairns, 1977
102.	Balanophyllia pittieri Vaughan, 1919

Phylum: CHORDATA
Class: REPTILIA
Order: TESTUDINATA
Family: DERMATEMYDIDAE
Species:

103.	Dermatemys mawii Gray, 1847

Family: DERMOCHELYIDAE
Species:

104.	Dermochelys coriacea (Vandelli, 1761)

Order: SERPENTES
Family: ELAPIDAE
Species:

105.	Micrurus diastema (Duméril, Bibron & Duméril, 1854)
106.	Micrurus nigrocinctus (Girard, 1854)

Class: MAMMALIA
Order: RODENTIA
Family: ERETHIZONTIDAE
Species:

107.	Sphiggurus mexicanus (Kerr, 1792)

Class: AVES
Order: FALCONIFORMES
Family: FALCONIDAE
Species:

108.	Daptrius americanus (Boddaert, 1783)
109.	Herpetotheres cachinnans (Linnaeus, 1758)
110.	Falco columbarius Linnaeus, 1758
111.	Falco deiroleucus Temminck, 1825
112.	Falco femoralis Temminck, 1822
113.	Falco peregrinus Tunstall, 1771
114.	Polyborus plancus (Miller, 1777)
115.	Micrastur ruficollis (Vieillot, 1817)
116.	Falco rufigularis Daudin, 1800
117.	Micrastur semitorquatus (Vieillot, 1817)
118.	Falco sparverius Linnaeus, 1758

Phylum: CNIDARIA
Class: ANTHOZOA
Order: SCLERACTINIA
Family: FAVIIDAE
Species:

119.	Montastraea annularis (Ellis & Sol&er, 1786)
120.	Manicina areolata (Linnaeus, 1758)
121.	Montastraea cavernosa (Linnaeus, 1767)
122.	Diploria clivosa (Ellis & Solander, 1786)
123.	Favia fragum (Esper, 1793)
124.	Diploria labyrinthiformis (Linnaeus, 1758)
125.	Colpophyllia natans (Houttuyn, 1772)
126.	Diploria strigosa (Dana, 1846)

Phylum: CHORDATA
Class: MAMMALIA
Order: CARNIVORA
Family: FELIDAE
Species:

127.	Puma concolor (Linnaeus, 1771)
128.	Puma concolor CITES Appendix II populations
129.	Panthera onca (Linnaeus, 1758)
130.	Leopardus pardalis (Linnaeus, 1758)

131.	Leopardus wiedii (Schinz, 1821)
132.	Leopardus wiedii J. A. Allen, 1919 ssp. nicaraguae
133.	Herpailurus yaguarondi (Lacépède, 1809)
134.	Herpailurus yaguarondi (Mearns, 1901) ssp. fossata
135.	Herpailurus yaguarondi (Lacépède, 1809) CITES Appendix I populations

Phylum: CNIDARIA
Class: ANTHOZOA
Order: SCLERACTINIA
Family: FLABELLIDAE
Species:

136.	Flabellum moseleyi Pourtalès, 1880

Family: FUNGIACYATHIDAE
Species:

137.	Fungiacyathus crispus (Pourtalès, 1871)

Family: GARDINERIIDAE
Species:

138.	Gardineria minor Wells, 1973

Family: GUYNIIDAE
Species:

139.	Guynia annulata Duncan, 1872
140.	Schizocyathus fissilis Pourtalès, 1874

Phylum: CHORDATA
Class: REPTILIA
Order: SAURIA
Family: IGUANIDAE
Species:

141.	Iguana iguana Linnaeus, 1758

Order: SERPENTES
Family: LOXOCEMIDAE
Species:

142.	Loxocemus bicolor Cope, 1861

Phylum: CNIDARIA
Class: ANTHOZOA
Order: SCLERACTINIA
Family: MEANDRINIIDAE
Species:

143.	Dendrogyra cylindrus (Ehrenberg, 1834)
144.	Meandrina maeandrites (Linnaeus, 1758)
145.	Dichocoenia stokesii Milne Edwards and Haime, 1848

Class: HYDROZOA
Order: MILLEPORINA
Family: MILLEPORIDAE
Species:

146.	Millepora alcicornis Linnaeus, 1758
147.	Millepora complanata Lamarck, 1816

Class: ANTHOZOA
Order: SCLERACTINIA
Family: MUSSIDAE
Species:

148.	Mycetophyllia aliciae Wells, 1973
149.	Mussa angulosa (Pallas, 1766)
150.	Scolymia cubensis (Milne Edwards & Haime, 1849)
151.	Mycetophyllia daniana Milne Edwards and Haime, 1849
152.	Mycetophyllia ferox Wells, 1973
153.	Mycetophyllia lamarckiana Milne Edwards and Haime, 1848
154.	Isophyllia multiflora Verrill, 1901
155.	Mycetophyllia reesi Wells, 1973
156.	Isophyllastrea rigida (Dana, 1846)
157.	Isophyllia sinuosa (Ellis & Solander, 1786)

Phylum: CHORDATA
Class: MAMMALIA
Order: CARNIVORA
Family: MUSTELIDAE
Species:

158.	Eira barbara (Linnaeus, 1758)
159.	Lontra longicaudis (Olfers, 1818)

Phylum: CNIDARIA
Class: ANTHOZOA
Order: ANTIPATHARIA
Family: MYRIOPATHIDAE
Species:

160.	Plumapathes pennacea (Pallas, 1766)

Phylum: CHORDATA
Class: MAMMALIA
Order: XENARTHRA
Family: MYRMECOPHAGIDAE
Species:

161.	Myrmecophaga tridactyla Linnaeus, 1758

Phylum: CNIDARIA

Class: ANTHOZOA
Order: SCLERACTINIA
Family: OCULINIDAE
Species:

162.	Madrepora carolina (Pourtalès, 1871)
163.	Madrepora oculata Linnaeus, 1758

Phylum: CHORDATA
Class: AVES
Order: FALCONIFORMES
Family: PANDIONIDAE
Species:

164.	Pandion haliaetus (Linnaeus, 1758)

Class: MAMMALIA
Order: CARNIVORA
Family: PHOCIDAE
Species:

165.	Monachus tropicalis (Gray, 1850)

Phylum: CNIDARIA
Class: ANTHOZOA
Order: SCLERACTINIA
Family: POCILLOPORIDAE
Species:

166.	Madracis decactis (Lyman, 1859)
167.	Madracis formosa Wells, 1973
168.	Madracis mirabilis (Duchassaing & Michelotti, 1860)
169.	Madracis myriaster (Milne Edwards & Haime, 1849)
170.	Madracis pharensis (Heller, 1868)

Family: PORITIDAE
Species:

171.	Porites astreoides Lamarck, 1816
172.	Porites colonensis Zlatarski, 1990
173.	Porites porites (Pallas, 1766)

Phylum: CHORDATA
Class: MAMMALIA
Order: CARNIVORA
Family: PROCYONIDAE
Species:

174.	Potos flavus (Schreber, 1774)
175.	Nasua narica (Linnaeus, 1766)

Class: AVES

Order: PSITTACIFORMES
Family: PSITTACIDAE
Species:

176.	Amazona albifrons (Sparrman, 1788)
177.	Ara ambigua (Bechstein, 1811)
178.	Amazona autumnalis (Linnaeus, 1758)
179.	Aratinga canicularis (Linnaeus, 1758)
180.	Amazona farinosa (Boddaert, 1783)
181.	Pionopsitta haematotis (Sclater & Salvin, 1860)
182.	Aratinga holochlora (Sclater, 1859)
183.	Brotogeris jugularis (Müller, 1776)
184.	Bolborhynchus lineola (Cassin, 1853)
185.	Ara macao (Linnaeus, 1758)
186.	Ara militaris (Linnaeus, 1766)
187.	Aratinga nana (Vigors, 1830)
188.	Amazona ochrocephala (Lesson, 1842) ssp. auropalliata
189.	Amazona ochrocephala (Gmelin, 1788)
190.	Amazona ochrocephala Ridgway, 1887 ssp. oratrix
191.	Amazona ochrocephala Lousada, 1989 ssp. caribaea
192.	Amazona ochrocephala Monroe & Howell, 1966 ssp. parvipes
193.	Pionus senilis (Spix, 1824)
194.	Aratinga strenua (Ridgway, 1915)
195.	Amazona xantholora (Gray, 1859)

Order: PICIFORMES
Family: RAMPHASTIDAE
Species:

196.	Ramphastos sulfuratus Lesson, 1830

Class: ELASMOBRANCHII
Order: ORECTOLOBIFORMES
Family: RHINCODONTIDAE
Species:

197.	Rhincodon typus Smith, 1828

Phylum: CNIDARIA
Class: ANTHOZOA
Order: SCLERACTINIA
Family: SIDERASTREIDAE
Species:

198.	Siderastrea radians (Pallas, 1766)

199.	Siderastrea siderea (Ellis & Solander, 1786)

Phylum: CHORDATA
Class: AVES
Order: STRIGIFORMES
Family: STRIGIDAE
Species:

200.	Otus atricapillus (Temminck, 1822)
201.	Glaucidium brasilianum (Gmelin, 1788)
202.	Asio clamator (Vieillot, 1807)
203.	Lophostrix cristata (Daudin, 1800)
204.	Speotyto cunicularia (Molina, 1782)
205.	Strix fulvescens (Sclater & Salvin, 1875)
206.	Glaucidium gnoma Wagler, 1832
207.	Otus kennicottii (Elliot, 1867)
208.	Glaucidium minutissimum (Wied, 1821)
209.	Strix nigrolineata Sclater, 1859
210.	Pulsatrix perspicillata (Latham, 1790)
211.	Asio stygius (Wagler, 1832)
212.	Otus trichopsis (Wagler, 1832)
213.	Strix virgata (Cassin, 1850)
214.	Bubo virginianus (Gmelin, 1788)

Phylum: MOLLUSCA
Class: GASTROPODA
Order: NEOTAENIOGLOSSA
Family: STROMBIDAE
Species:

215.	Strombus gigas (Linnaeus, 1758)

Phylum: CNIDARIA
Class: HYDROZOA
Order: STYLASTERINA
Family: STYLASTERIDAE
Species:

216.	Stylaster roseus (Pallas, 1766)

Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: SYNGNATHIFORMES
Family: SYNGNATHIDAE
Species:

217.	Hippocampus ingens Girard, 1858

Class: MAMMALIA
Order: PERISSODACTYLA
Family: TAPIRIDAE
Species:

218.	Tapirus bairdii (Gill, 1865)

Order: ARTIODACTYLA
Family: TAYASSUIDAE
Species:

219.	Tayassu pecari (Link, 1795)
220.	Pecari tajacu (Linnaeus, 1758)
221.	Pecari tajacu CITES Appendix II populations

Class: AVES
Order: CICONIIFORMES
Family: THRESKIORNITHIDAE
Species:

215.	Plegadis falcinellus (Linnaeus, 1766)

Class: MAMMALIA
Order: SIRENIA
Family: TRICHECHIDAE
Species:

216.	Trichechus manatus Linnaeus, 1758

Class: AVES
Order: APODIFORMES
Family: TROCHILIDAE
Species:

217.	Abeillia abeillei (Lesson & DeLattre, 1839)
218.	Glaucis aenea Lawrence, 1867
219.	Microchera albocoronata (Lawrence, 1855)
220.	Lampornis amethystinus Swainson, 1827
221.	Heliothryx barroti (Bourcier, 1843)
222.	Amazilia beryllina (Deppe, 1830)
223.	Amazilia candida (Bourcier & Mulsant, 1846)
224.	Chlorostilbon canivetii (Lesson, 1832)
225.	Thalurania colombica (Bourcier, 1843)
226.	Archilochus colubris (Linnaeus, 1758)
227.	Heliomaster constantii (DeLattre, 1843)
228.	Campylopterus curvipennis (Deppe, 1830)
229.	Phaeochroa cuvierii (DeLattre & Bourcier, 1846)
230.	Amazilia cyanocephala (Lesson, 1829)

231.	Amazilia cyanura Gould, 1859
232.	Colibri delphinae (Lesson, 1839)
233.	Tilmatura dupontii (Lesson, 1832)
234.	Hylocharis eliciae (Bourcier & Mulsant, 1846)
235.	Atthis ellioti Ridgway, 1878
236.	Doricha enicura (Vieillot, 1818)
237.	Eupherusa eximia (DeLattre, 1843)
238.	Eugenes fulgens (Swainson, 1827)
239.	Klais guimeti (Bourcier, 1843)
240.	Lophornis helenae (DeLattre, 1843)
241.	Campylopterus hemileucurus (Deppe, 1830)
242.	Hylocharis leucotis (Vieillot, 1818)
243.	Heliomaster longirostris (Audebert & Vieillot, 1801)
244.	Phaethornis longuemareus (Lesson, 1832)
245.	Amazilia luciae (Lawrence, 1867)
246.	Florisuga mellivora (Linnaeus, 1758)
247.	Anthracothorax prevostii (Lesson, 1832)
248.	Lamprolaima rhami (Lesson, 1838)
249.	Threnetes ruckeri (Bourcier, 1847)
250.	Amazilia rutila (DeLattre, 1842)
251.	Phaethornis superciliosus (Linnaeus, 1766)
252.	Lampornis sybillae (Salvin & Godman, 1892)
253.	Colibri thalassinus (Swainson, 1827)
254.	Amazilia tzacatl (De la Llave, 1833)
255.	Chalybura urochrysia (Gould, 1861)
256.	Lampornis viridipallens (Bourcier & Mulsant, 1846)
257.	Amazilia yucatanensis (Cabot, 1845)

Order: TROGONIFORMES

Family: TROGONIDAE

Species:

258.	Pharomachrus mocinno de la Llave, 1832

Class: REPTILIA

Order: SERPENTES

Family: TROPIDOPHIIDAE

Species:

259.	Ungaliophis continentalis Müller, 1880

Class: AVES

Order: STRIGIFORMES
Family: TYTONIDAE
Species:

260.	Tyto alba (Scopoli, 1769)

Class: REPTILIA
Order: SERPENTES
Family: VIPERIDAE
Species:

261.	Bothrops asper (Garman, 1884)
262.	Agkistrodon bilineatus Günther, 1863
263.	Crotalus durissus Linnaeus, 1758
264.	Porthidium nasutum (Bocourt, 1868)
265.	Atropoides nummifer (Rüppell, 1845)
266.	Porthidium ophryomegas (Bocourt,1869)
267.	Bothriechis schlegelii (Berthold, 1846)

Source: www.cites.org/database/Honduras (last updated April 2002).
Edited by Jaime Bustillo, Dec. 2002

#5 Most current information of activities for biodiversity conservation efforts by Government, municipalities, NGOs, Universities, and donor organizations.

(See table attached next)

#6. List of documents reviewed.

1. Dirección General de Biodiversidad, Secretaria de Recursos Naturales y Ambiente. 2001. Estrategia Nacional para la Biodiversidad y Plan de Acción. Tegucigalpa, DC, Honduras.
2. Dirección General de Biodiversidad, Secretaria de Recursos Naturales y Ambiente. 2001. Estudio sobre Diversidad Biológica de la República de Honduras. Tegucigalpa, DC, Honduras.
3. Secretaria de Recursos Naturales y Ambiente. 2000. Informe del Estado del Ambiente. Tegucigalpa, DC, Honduras
4. USAID/G-CAP's "The Green Book" Vol. 1, 2 and 3
5. Suazo Jenny. 2002. Directrices para el Desarrollo Ambiental Sustentable de Honduras en el Area Temática: Manejo Sustentable de Areas Protegidas y Biodiversidad. USAID.
6. Suazo, Jenny. 2002. Area Temática: Manejo Sustentable de los Bosques. USAID.
7. USAID/Consuplane. 1982 Perfil Ambiental de Honduras. Tegucigalpa, DC, Honduras.
8. USAID/SECPLAN. 1989. Perfil Ambiental de Honduras. Tegucigalpa, DC, Honduras.
9. PNUD/GEF/SERNA. 1997. Perfil Ambiental de Honduras. Tegucigalpa, DC, Honduras.
10. Secretaria de Agricultura y Ganadería (SAG). 2001. Informe anual de actividades 2000. Tegucigalpa, DC, Honduras.
11. PROARCA/APM. 2002. Corredor Biologico Golfo de Fonseca, Honduras. 87 pag. USAID.
12. CCAD. Estado del Ambiente y los Recursos Naturales en Centroamérica.
13. Informes del Cumplimiento de los Países Centroamericanos de los COP en Diversidad Biológica
14. USAID. Biodiversity Conservation Program Design & Management: A Guide for USAID Staff"158 pages.
15. Secretaria de Agricultura y Ganadería. Informe anual de avance de actividades físicas y financieras del año 2001 del Proyecto de Administración de Areas Rurales (PAAR). Tegucigalpa, Honduras, C. A.
16. The Nature Conservancy, World Wildlife Fund and Rain Forest Alliance. Improved environmental management in the Mesoamerican Biological Corridor. Protected areas and environmentally sound products. Volume 1: Technical.
17. World Bank. 1997. Honduras Biodiversity Priority Areas Project. 1818 H. Stret, NW. Washington, D.C. 20433
18. Biodiversity Support Program (BSP) 1995. A regional Analysis of Geographic Priorities for Biodiversity Conservation in Latin America and the Caribbean. USAID/TNC/WC/WRI/World Wildlife Fund 1250 24th street. N.W. Washington, D.C. 20037, USA.
19. National Geographic. BiodiveRsidad: La Fragil Red. Vol. 4, No. 2, pag 2-84. Febrero 1999.

20. SEDA. 1993. Ley General del Ambiente y su reglamento. Editorial Guaymuras, apartado postal 1843. Tegucigalpa, Honduras. 224. pag.
21. Johnston, George and Hilary Lorraine. 1994. The Green Book: Vol. 1, 2 and 3. RENARM/USAID
22. AFE-COHDEFOR, SECPLAN and SRN. 1996. Plan de Accion Forestal [PLANFOR] 1996 – 2015. Vol. I, II and III
23. House, Paul and Thelma Mejia. 2002. Mapa de Ecosistemas Vegetales de Honduras. Manual and Map 1:500,000 scale in CD.
24. Results from interviews and information provided by municipalities (via fax, telephono, post office mail and even e-mails.
25. Results from interviews and information provided by ONG's, PVO's, and universities (via fax, telephono, post office mail and even e-mails.

#7. List of Governmental and non governmental Institutions and persons contacted[36]

Name and charge	Institution/program	Tel. and fax
Ing. Carlos Pineda, Viceministro	SERNA	235-4895
Ing. Hector Lainez, subdirector	DIBIO	235-4895
Lic. Carlos Garcia, Jefe Depto. Investigacion	DIBIO	235-4895
Lic. Olvin Andino, asesor Ministra SERNA	SERNA	232-2011, -8032 232-1366, X-123
Jorge Betancourt, Director asociado area Recursos Naturales y Ambiente	Cuerpo de Paz	232-1753
Lic. Vilma Lorena Ochoa, Jefe depato Biologia	UNAH/Facultad de Biologia	232-2110, X-170
Catedraticos: Carlos Cerrato, Gustavo cruz, Saul Flores, Gerardo Borjas (coordinador carrera) , Pilar Thorn, Dora Elisa Perez, Cirilo Nelson, Thelma Mejia,	UNAH/Facultad de Biologia	232-2110, X-170
Ing. German Perez, Viceministro	SAG	239-1994
Ing. Marcio Castejon, Director	DIGEPESCA/SAG	239-1994
Lic. Luis Morales, Jefe Investigacion	DIGEPESCA/SAG	239-1994
Lic. Eloisa Espinoza, Jefe Depto Acuicultura y Pesca Continental.	DIGEPESCA/SAG	239-1994
Lic. Rigoberto Gonzalez, Jefe Programacion	DIGEPESCA/SAG	239-1994
Dr.Konrad Vebelhor, director (ATP) Ing. Fausto Lazo, asistente	GTZ/Sistema Social Forestal	239-8384 239-2906
Ing. Arnulfo Metzgen, director Ing. Wilfredo David, asistente	GTZ/R.B. Rio Platano	239-2906
Ing. Marco Espinoza, director	GTZ/PROFOR	239-2906
Ing. Humberto Ordoñez, director	GTZ/Celaque	662-1459
Ing. Conrado Gonzalez, Jefe del Depto. Areas Protegidas y Vida Silvestre	AFE-COHDEFOR	223-4346 223-7703
Lic. Leonel Marineros, Jefe componente Vida Silvestre Lic. Héctor Portillo y Lic. Manuel Rey y Lic. Marta Moreno. Vida Silvestre	AFE-COHDEFOR	223-4346 223-7703 223-3248
Ing. Carlos Sandoval, Jefe Depto. Manejo de Bosques	AFE-COHDEFOR	223-4346
Ing. Victor Archaga, director PROBAP	PROBAP/BM-PNUD	223-4346
Lic. Oscar Munguia (Decano area Ciencias) y Lic. Jose Luis Guerrero (jefe depto.),	Univ. Pedagogica Nacional F.M.	239-8037, X-198
Catedraticos en biologia: Lic. Maynor Garcia, Lic. Zoila Moncada, Dora E. Perez, Isbela Hernandez y otros.	Univ. Pedagogica Nacional F.M.	239-8037, X-198
See Municipalities list attached next		
See NGOs list attached next		

(It continues on the next page)

[36] List of people contacted by telphonne, faxes, mail, e-mail or in person during period Oct 11 to Nov. 7, 2002.

Name and charge	Institucion	Telefono/fax
Ing. Jorge Quiñónez (Director), Ing. Tato Abarca (Subdirector)	Fundacion Vida	239-1642 239-1645
Ing. Napoleón Morazán, oficial de proyectos	Fundacion Vida	239-1642 239-1645
Lic. Sandra Mendoza, Coordinadora de Programas Nicaragua y Honduras	The Nature Conservancy (TNC) Division de Centro America	238-7016 y 220-4570 fax 220-4571
Lic. Alejandro Aguilar, coordinador sitio Lago Yojoa	TNC - PROARCA/APM	969-5340 y 988-2300
Lic. Sergio Midence, asesor tecnico de sitio La Mosquitia hondureña	TNC – PROARCA/APM	238-7016 y 220-4570 fax 220-4571
Ing. Edas Muñóz, asesor tecnico regional/Golfo de Fonseca	Word Wildlife Fund (WWF) Centro America	235-8506
Lic. Erasmo Sosa, Gerente de Desarrollo de Producto y Ecoturismo	Instituto Hondureño de Turismo (IHT)	222-2124
Ing. Mateo Molina, especialista local en recursos naturals y Ambiente	Banco Interamericano de Desarrollo (BID)	232-4838 fax 239-5752
Ing. Orlando Lara, coordinador interino; y Lic. Gloria Loreña, consultora	BID proyecto MARENA 2o. piso, local 23 Edif. Continental (across Comercial Miramontes),	235-7558
Ing. Jose Galdamez, Coordinador Sub componente Biodiversidad	SAG, Proyecto Areas Rurales (PAAR) Behind CELTEL, Blvd. Suyapa, 2o. piso Educredito	239-6259 239-9848 and 49
Peter Doyle (coordinador), catedraticos: Nelson Agudelo, Luis Caballero y Jorge Ivan Restrepo, Carrera Desarrollo Economico y Ambiente	Escuela Agricola Panamericana (EAP)	776-6140 X-2601 fax 776-6062
Ing. Fausto Mejia, Coordinador CBM-SERNA.	Corredor Biologico Mesoamericano (CBM) y SERNA-DiBio	235-3764 (2a.planta DiBio)
Ing. Sonia Suazo, enlace tecnico nacional CBM	Corredor Biologico Mesoamericano (CBM)	239-0530 (Agenda Forestal), celular 998-0211.
Ing. Arnulfo Cruz, director ejecutivo	PROLEÑA	235-8505
Lic. Hugo Galeano (director) y Lic. Marlene Santos (Asistente)	Programa Pequeñas Donaciones (PPD/PNUD)	231-0102 220-1100

#8. List Municipalities Contacted (all neighboring the 38 proposed High-priority protected areas)[37].

Department	Municipalities	Phone	fax	Send to:	Answered (Yes/No)
Cortés	1. Puerto Cortes	665-5908	665-3610	Fidel Ernesto López UMA Head	Yes
Cortés	2. San Pedro Sula	556-7711	NA	Marlon Sierra, UMA Head	Yes
Cortés	3. Santa Cruz de Yojoa	654-8183	654-8302	German Danilo Sanchez	Yes
Cortés	4. Omoa	658-9152	658-9149	Cesar Jeresano, UMA Head	Yes
Francisco Morazán	5. Tegucigalpa	236-9616	236-9480	Jonathan Laínez, UMA Head	No
Francisco Morazán	6. Gaimaca	769-4280	NA	Major or UMA Head	No
Francisco Morazán	7. Tatumbla	776-6348	NA	Leonidas Enamorado, Major	No
Francisco Morazán	8. Villa de San Francisc	777-0333	NA	Erik Leonardo Mejía, Major	No
La Paz	9. La Paz	774-2298	NA	Nelson Rivera, UMA Head	Yes
La Paz	10. Santiago de Puringla	774-2566	NA	Major or UMA Head	No
La Paz	11. Guajiquiro	NA	NA	Major or UMA Head	Yes
La Paz	12. Marcala	764-5329	NA	Marilu Aguilar, Major	No
La Paz	13. San Pedro	774-2970	NA	Major or UMA Head	No
Islas de la Bahía	14. Guanaja	4534338	453-4351	Erik Tatoon, Major	No
Islas de la Bahía	15. Roatán	445-1299	NA	Mario Lopez, Major Fernando Díaz, UMA Head	Yes
Islas de la Bahía	16. Santos Guardiola	435-2399	435-2191	Curby Duck, Major Marlen Cacho, UMA Head	Yes
Islas de la Bahía	17. Utila	425-3275	NA	Shelby McNab	Yes
Colón	18. Trujillo	4344648	434-4648	Alex A. Amaya, Major	Yes
Colón	19. Saba	991-1241	NA	Major or UMA Head in charge	Yes
Yoro	20. Morazán	650-0013	NA	Wady Handal, Major Juan Carlos Ortis Cubas UMA Head	Yes
Yoro	21. Yoro	671-2350	671-2350	Marcio G. Isaula George, Major	Yes
Yoro	22. Arenal	433-0127	433-0127	Luis Alonso Andrade UMA Head	Yes
Ocotepeque	23. Belen Gualcho	651-9600	NA	RamiroVentura E., Major Sosismo Murillo, UMA Head	No
Ocotepeque	24. Nueva Ocotepeque	653-3079	NA	Luis A. González, Major	No
Ocotepeque	25. Fraternidad	653-3384 653-3446	NA	Major or UMA Head	No
Intibuca	26. Jesús de Otoro	NA	NA	Guillermo Tosta, Major Omar Inestroza, UMA Head	Yes
Intibuca	27. La Esperanza	783-0416	783-1818	Santos Aguilar, Major	Yes
Intibuca	28. San Juan	898-2282	898-2282	Jesús Castillo, UMA Head	Yes
Intibuca	29. San Fco. de Opalaca	NA	NA	Major or UMA Head in charge	No

NA= Not Available

(It continues on the next page)

[37]. Prepared by Suyapa Dominguez and Jaime Bustillo for USAID Honduras Biodiversity Assessment 2002.

List of Contacted Municipalities **(Cont**.).

Department	**Municipalities**	**Phone**	**Fax**[38]	**Send to:**	**Answered** (Yes/NO)
Olancho	30. Catacamas	899-4844	NA	Ramón Calix U. Major	Yes
Olancho	31. Juticalpa	885-0046	NA	José R. Henriquez, Major, Santo Cruz, UMA Head	Yes
Olancho	32. Campamento	889-0972	889-0935	Major or UMA Head in charge	No
Olancho	33. Catacamas	899-4243	NA	Ramón Calix Urtecho, Major Adrián Cruz, UMA Head	No
Olancho	34. Dulce Nombre de Culmi	899-5324	NA	Julian Chavez, Major	No
Olancho	35. Concordia	191 Hondutel	191 Hondutel	Major or UMA Head in charge	No
Olancho	36. Guayape	885-1788	191 Hondutel	Major or UMA Head in charge	No
Olancho	37. La Unión	885-0032	191 Hondutel	Santos Isabel Zelaya L., Major	Yes
Olancho	38. San Esteban	191 Hondutel	191 Hondutel	Luis G. Castellón, Major	No
Gracias a Dios	39. Puerto Lempira	898-7436	898-7436 898-0014	Major or UMA Head in charge	No
Gracias a Dios	40. Wampusirpi	NA	NA	Major or UMA Head in charge	No
Gracias a Dios	41. Brus Laguna	NA	NA	Major or UMA Head in charge	No
Gracias a Dios	42. Ahuas	NA	NA	Major or UMA Head in charge	No
Gracias a Dios	43. Juan Francisco Bulnes	NA	NA	Major or UMA Head in charge	No
Gracias a Dios	44. Villeda Morales	NA	NA	Major or UMA Head in charge	No
Comayagüa	45. Comayagüa	772-1590 772-1747	772-1590	Carlos Miranda, Major	Yes
Comayagüa	46. Ajuterique	777-2139	777-2139	Francisco Mejía, Major	Yes
Comayagüa	47. Lejamaní	777-2613	777-2631	Heber Alvarado, Major Dennis O. Martinez, UMA Head	Yes
Comayagüa	48. Sigüatepeque	773-0021	773-0021	Santos Discua Z., Major Job Elí Arita, UMA Head	No
Copán	49. Santa Rosa de Copán	662-2357	662-2357	Hector López, Major	Yes
Copán	50. Copán Ruinas	651-4074	651-4074	Lisandro M. Arias, Major	Yes
Copán	51. Florida	898-0135	898-0135	José Madrid Melgar, Major	Yes

(It continues on the next page)

[38] Remote municipalities, use 191 Hondutel to send or receive faxes. Sometimes also they share local private or NGO faxes.

List of Contacted Municipalities (Cont.).

Department	Municipalities	Phone	Fax	Send to:	Answered SI/NO
Copán, Lempira and Ocotepeque	52. Consejo Intermunicipal Pro manejo Subcuenca Rio Higuito (located in in Santa Rosa de Copan) and representing, 15 municipalities	657-9248	657-9248	Nolberto Emilio López, Unidad Técnica Inter Municipal (UTIM)	Yes
Lempira	53. Gracias	656-1154	656-1154	Mario D. Ramírez Major Elisa Muñoz, UMA Head	Yes
Lempira	54. Lepaera	655-5090	655-5003	Hugo A. Arriaga, UMA Head	Yes
Lempira	55. La Iguala	655-5003	655-5003	Major or UMA Head	No
Lempira	56. Las Flores	191 Hondutel	NA	Major or UMA Head	No
Santa Barbara.	57. Trinidad	665-1690	664-1690	Francisco Mancia, Major	Yes
Santa Barbara	58. Santa Barbara	643-2910	643-2683	Dennis Sanchez, Major	Yes
Santa Barbara	59. Las Vegas	659-3183	659-3183	Ramon A. Lara B., Major	Yes
El Paraíso	60. El Paraíso	893-4179	NA	Justo E. Sanchez, Major Arnaldo Cerrato, UMA Head	Yes
El Paraíso	61. Yuscaran	892-7111	NA	Roger Horacio, Major Ricardo A. Banegas, UMA	No
Atlántida	62. Tela	448-2102	448-2729 448-2102	Daniel Flores, Major Miguel Ordoñez, UMA Head	Yes
Atlántida	63. La Masica	436-1201	NA	Rogelio Gamez, Major	No
Atlántida	64. Arizona	986-0800	999-4602	Carlos Padilla, Major	No
Atlántida	65. Esparta	991-0232	991-0232	Consuelo Bautista, Major	No
Atlántida	66. Ceiba	440-0911 440-0912	440-0702	Gonzalo Rivera C., Major Jorge Padilla, UMA Head	Yes
Choluteca	67. Choluteca	882-0024	882-0024	Dr. Ricardo Andino, Major Pedro J. González UMA Head	No
Choluteca	68. San Antonio de Flores	898-6968	NA	Javier García, Major	No
Valle	69. Nacaome	895-4123	895-4454	Jorge S. Alvarez M., Major	Yes
Valle	70. Alianza	894-5600	NA	Raimundo Guevara, Major	No
Valle	71. Amapala	895-4576	NA	Jaime Talavera, Major	No

#9. List of contacted NGO, Universities and Other private organizations.[39]

Organization	Place	Phone & Fax	Sent to:	Answered Yes/No
NGOs and PVOs				
Asociación Amigos del Parque Nacional La Tigra (AMITIGRA)	Tegucigalpa, Fco. Morazan	235-8493	Manuel Luna, director ejecutivo e Ivo Francisco Alvarado (técnico)	Yes
Fundación Capiro y Calentura and Guaimoreto WR (FUCAGUA)	Trujillo, Colon	434-4294	Jose Wil Chavez Mejía (subdirector)	Yes
Fundación Cuero y Salado (FUCSA)	La Ceiba, Atlántida	443-0329	Leonel Sanchez director ejecutivo	Yes
Fundación Parque Nacional Pico Bonito (FUPNAPIB)	La Ceiba Atlántida	443-3824	Gerardo Rodríguez director ejecutivo	Yes
Fundación para la protección de Lancetilla, Punta Sal, yTexiguat (PROLANSATE)	Tela, Atlántida	448-2042	Antonio Fuentes director ejecutivo	Yes
Asociación Ecológica para la Protección del Parque Nacional Pico Pijol (AECOPIJOL)	Morazan Yoro	691-0412	Expectación Sánchez director ejecutivo	Yes
Fundación Ecologista Héctor Rodrigo Pastor Fasquelle (FEHRPF)	San Pedro Sula, Cortes.	550-1832	Fernando Fernández Vice-presidente ejecutivo	Yes
Fundación Hondureña para los Arrecifes Coralinos	Ceiba, Atlántida	443-4075 441-0701	Adrián Oviedo, director ejecutivo y Adonis Cubas	Yes
Mosquitia Pawisa (MOPAWI)	Tegucigalpa, Fco. Morazan	239-9234	Oswaldo Munguia, director ejecutivo y Carlos Molineros, coordinador	Yes
Ecosistema Montaña de Comayagüa (ECOSIMCO)	Comayagüa, Comayagüa	772-4681	Ing. Marco A. Cerritos, director ejecutivo y Johana Calix Mandaran	Yes
Bay Island Conservation Association (BICA)	Roatán, Islas de la Bahía	445-1424	Irma Brady, directora ejecutiva	No
BICA-Utila	Utila, Islas de la Bahía	425-3260 425-3275	Shelby Mcnab, directora ejecutivo Michel Fernández, tecnico	Yes
Red Hondureña ecologica (RHEDES)	La Ceiba, Atlántida	440-0385	Norman Flores, director ejecutivo	Yes
Comité para l;a Proteccion y Desarrollo del Golfo de Fonseca (CODDEFFAGOLF)	Tegucigalpa, DC and San Lorenzo, Choluteca	238-0415	Jorge Varela, director ejecutivo	Yes
Asociacion Conservacionista (ASCONA)	Choluteca	882-4768 882-3640	José Rene Mourra, director	Yes
Asociacion de Municipios para la Protecion del Lago Yojoa (AMUPROLAGO)	Lago de Yojoa	988-2300	Alejandro Aguilar, director	No
Fundación Ticamaya	San Pedro Sula	NA	Rafael Ponce, director	Yes
Fundación Patuca	Olancho	236-9910	Hauke Hopes, asesor	Yes
Aldea Global	Tegucigalpa, DC	232-8287 232-6511	Chet Thomas, director ejecutivo	Yes

[39] Prepared by Suyapa Dominguez and Jaime Bustillo for USAID Honduras Biodiversity Assessment 2002

Aldea Global (regional Siguatepeque)	Comayagüa, Comayagüa	773-1405 773-2029	José Vidal Lanza, Coordinador regional Maribel Sánchez, técnico	Yes
CARE International	San Pedro Sula	556-8011	Adolfo Pacheco	
CARE	Tegucigalpa, DC	235-5055 232-0913	Lic. Elvia de Verde Subdirectora Becky Myton, Segur. Alim. Arnaldo Bueso, coordinador programación	Yes
Colegio Profesionales Ciencias Agrícolas	Tegucigalpa, DC	237-7784 237-6928	Ing. Ramón Vasquez	No
Fundación Hondureña de Ambiente y Desarrollo (Fundación VIDA)	Tegucigalpa, DC	239-1642 239-1645	Ing. Jorge Quiñónez (director ejecutivo)	Yes
Vecinos Mundiales	Tegucigalpa, DC	230-2002 230-2004	Carlos Vijil Moreno	No
Asoc. Nac. De Exbecarios de Hond. (ANEDH)	Tegucigalpa, DC	232-4258	Luis Tinoco	Yes
Asoc. De Acuidultores (ANDAH)	Choluteca	882-3848	Jesús Francisco Avalos	No
Proy. Mejoramiento Ambiental y Des. Rural de Hond. (PROMADERAH)	El Progreso, Yoro	647-1749	Ing. Santiago Urbina Coordinador de proyecto	Yes
Economía, Sociedad y Ambiente (ESA) Consultores	El Progreso, Yoro	238-8570 238-8572	Luis Zepeda Coordinador de proyecto	No
Asociación Hondureña y Desarrollo Ecológico y Seguridad Alimentaria (ADEHSA)	El Progreso, Yoro	647-2398	Esduith Garcia, director ejecutiva y Gilberto Juarez, Coord. Ecologia.	No
Fundación Des. Econ. Indigena (BAYAN)	La Ceiba, Gracias a Dios	443-271`3	Soheheil Dooki y Mario Miranda	Yes
Fundación Parques Nacionales (FPN)	Tegucigalpa, DC	211-9127 211-8690	Gisselle Haddad, directora	No
Fundación Comunitaria PUCA, Mancomunidad de Municipios La Iguala, Las Flores, Lepaera y Gracias.	Lepaera, Depto. Lempira	655-5090 655-5003	Jorge Ponce, Presidente Junta Directiva	Yes
Asoc. Hond. Productores de Café (AHPROCAFE)	La Esperanza, Intibucá	898-2272	Ing. Rafael Perdomo, director	Yes
Asoc. Municipios de Honduras (AMHON)	Tegucigalpa, DC	236-6150 236-5233	Lic. Guadalupe López, director ejecutivo	No
Fundación del Banco del Café (FUNBANCAFE)	Tegucigalpa, DC	239-5211 239-9171	Rolando Bu, director ejecutivo	No
Cámara de Turismo de Tegucigalpa	Tegucigalpa, DC	236-9702	Raúl Welchez, Presidente	No
Cámara de Turismo de Roatán	Roatán	651-4477 651-4070	NA	No
Inst. Interamericano de Ciencias Agricolas (IICA)	Tegucigalpa, DC	232-3428 239-8095 232-8195	Francisco Mejía Coordinador proyecto Laderas IICA- Holanda	No
RARE (oficinas de PROLANSATE)	Tela, Atlántida	448-2042	Lic. Sandra Pineda, coord.	Yes
Mesoamerica	San Pedro Sula	557-8410	Sonia Regalado, directora	No
Fundación Desarrollo Sostenible de Omoa (FUNDESO)	Municipalidad de Omoa, Cortes.	658-9124	Ing. Ulrich Lang, secretario	No
Asociación de Ganaderos de Sula	San Pedro Sula	556-8501 556-6382	Jacobo Regalado	No
Asociación Ganaderos de Tocoa,	Tocoa, Colon	NA	Javier Antonio Banegas	No

Asociación de Ganaderos La Paz	La Paz, La Paz	774-2635	José Ovidio Suazo	No
Asociación de Ganadería y Agricultura de Choluteca	Choluteca, Choluteca	882-0833 882-0371	Roberto Natanael Hernandez	No
Asociación de Ganaderos de Oriente	Danli, El Paraiso	883-2764	Ing. Mario Alberto Lobo	No
Programa Ambiental Centroamericano (PROARCA/APM)	Guatemala city	 332-0523 367-0480	Kurt Rockerman Director PROARCA Juan Carlos Godoy, asesor Areas Protegidas	Yes
The Nature Conservancy (TNC) y PROARCA/APM	Tegucigalpa, DC	220-4570 238-7016 220-4571	Karen Lutz, Directora Sandra Mendoza, Coordinadora Hond-Nic. Lic. Sergio Midence, asesor tecnico La Mosquitia Hond.	No
World Wildlife Fund (WWF) y PROARCA/APM	Tegucigalpa, DC	235-8506	Edas Muñoz, Asesor técnico Golfo de Fonseca	Yes
Alianza Trinacional (TRIGOH)	Belice, Honduras y Guatemala.	550-1832	Dr. Fernando Fernández. miembro	Yes
Corredor Biológico Mesoamericano (CBM)		(505) 233-1448	Teresa Zuniga coordinador regional	No
Corredor Biológico Mesoamericano (CBM)	Tegucigalpa, DC	998-0211	Sonia Suazo, directora enlace nacional	Yes
World Conservation Society (WCS)	Tegucigalpa, DC		Carla Suarez	Yes
Comité Centroamericano de Ambiente y Desarrollo (CCAD)	Tegucigalpa, DC		Ronald Vargas	No
Union Internacional para la Conservación de la Naturaleza (UICN)	Tegucigalpa, DC	237-8549	Hector Midence, Marta Oviedo	No
Fundación Patuca	Tegucigalpa	236-9910 (casa) 5576409 6738461	Hauke Hopes	Yes
Cuerpo de Paz – Recursos Naturales	Tegucigalpa, DC	232-1753	Lic. Jorge Betancourt, director	Yes
Universities				
Universidad Nacional Autonoma de Honduras (UNAH) – Depto. Biologia	Tegucigalpa, DC	232-2110-ext 70 232-5836	Lic. Lorena Ochoa Jefe de Departamento;	no
			Lic. Gerardo Borjas (coordinador carrera);	Yes
			Catedraticos HNAH-DB: Dr. Gustavo Cruz , Lic. Carlos Cerrato Lic. Pilar Thorn.	Yes
UNAH-CURLA	La Ceiba	441-2588 441-2589	Sary Alcantara Juan Hernandez	No
UNAH- CURN	San Pedro Sula		Jaime Rios, Carlos Martinez y Suyapa de Martinez	Yes
Universidad José Cecilio del Valle	Tegucigalpa	239-8448	Lic. Juan Carlos Galindo coordinador de turismo	No
Universidad Tecnológica Centroamericana (UNITEC)	Campus Tegucigalpa	239-4076 230-4008	Lic. Lester López Coordinador carrera ambiental	Yes
UNITEC	Campus San Pedro Sula		Lic. Doris Castro, catedrática de Ecología	Yes

Universidad San Pedro Sula (USPS)	San Pedro Sula		Lic. Mercedes Sierra catedrática Educ. Ambiental	No
Universidad Tecnológica de Honduras (UTH)	San Pedro Sula		Prof. Jenny Cerrato, de Flora y Fauna	Yes
Universidad Pedagógica Nacional Francisco Morazán (UPNFM)	Campus Tegucigalpa		Lic. Zoila Moncada Lic. Isbela Hernandez Lic. Maynor Garcia y otros.	Yes
Universidad Pedagógica Nacional Francisco Morazán (UPNFM)	Campus San Pedro Sula		Lic. Sandra Chevez, catedrática de Zoología. Lic. Berta Alicia Guerra catedrática de ecoturismo	Yes
Escuela Agrícola Panamericana (EAP)	El Zamorano, Francisco Morazán	776-6150 776-6247	Peter Doyle, encargado de RN; Director Keneth Hoadley	Yes
Escuela Nacional de Ciencias Forestales (ESNACIFOR)	Siguatepeque, Comayagüa	773-0011 773-0300	Cesar Alvarado y Rosaura Gómez Alemán (Ambiente)	Yes
Universidad Nacional de Agricultura UNA (former ENA)	Catacamas, Olancho	889-4914 899-4901	Ing. Gustavo López y Lic. Mireya Suazo	No
Escuela de agricultura Luis Landa	Nacaome, Valle	8954309 8954307	Ing. Reulo Berrios Gómez	Yes
Escuela Agricultura JFK Francisco Atlántida	Atlántida	4411615 4411615	Ing. Osman Zelaya	Yes
Jardin Botánico de Wilson Popenoe "Lancetilla"; y proyecto PROECEN	Lancetilla, Tela, Cortés.	448-1740	Ciro Navarro, director; Ricardo Bueso, coord.	No
Roatan Institute of Marine Science (RIM)	Roatan, Islas de la Bahia	445-1327	Aldon Botton	No
Fundación Hondureña de Investigación Agrícola (FHIA)	La Lima, Cortes	668-2313	Adolfo Martínez	Yes
Organismos Bilaterales y Multilaterales				
Banco Interamericano de Desarrollo (BID)	Tegucigalpa, DC.	239-5752	Mateo Molina, especialista local en Recursos Naturales	Yes
Corporación Suiza para el Desarrollo (COSUDE)	Tegucigalpa, DC.	235-6474 239-5786	Thomas Walder	Yes
United Nations Food and Agriculture Organization (FAO)	Tegucigalpa, DC.	221-4248 236-7124	Carlos Andrés Zelaya (Asistente de Programas)	Yes
Agencia de Cooperacion Internacional Japonesa (JICA)	Tegucigalpa, DC.	232-6727 231-1034	Lic.Takeshi Takano	No
Cooperación Española	Tegucigalpa, DC	2322019 2322459	Ing.Wilfredo Rodríguez	No
Cooperación Holandesa	Tegucigalpa, DC	236-5713	Martha klein y Ninky Swagemakers (encargada del ambiente)	Yes
Cooperación Alemana, GTZ	Tegucigalpa, DC	239-2876 235-5253	Arnulfo Metzgen (coord. proyecto Río Plátano)	Yes
Comitato Internazionale Per lo Sviluppo Dei Popoli (CISP) (Comité Internacional para el desarrollo de los pueblos, en español)	Tocoa, Colon	NA	Ref. Leonarda Andino (El Heraldo)	No
Proyecto de Pequeñas Donaciones (PPD/PNUD)	Tegucigalpa, DC	220-1100	Lic. Hugo Galeano, director y Marlene Santos, asistente	Yes
Misión de China	Comayagüa	772-1857 772-3417	Santiago Huan	No

Agencia Canadiense Desarrollo Internacional (ACDI)	Tegucigalpa. DC	232-2610 232-6102	Camiller Bemrleau	Yes
Cooperación Italiana	Tegucigalpa, DC y La Esperanza	998-5705	Maximiliano Gattie	No
OIRSA	Tegucigalpa, DC	239-9315	Guillermo Cruz	No
Banco Centroamericano para el Desarrollo (BCIE)	Tegucigalpa, DC	282-1551	Donaldo Ochoa	No
Comité Centroamericano de Ambiente y Areas Protegidas (CCAB-AP)	Tegucigalpa, DC	239-0530 220-0683	Ing. Juan Blas Zapata, director	No
BCIE	Tegucigalpa, DC	228-2243	Lic. DonaldoOliva	No
Other Private satkeholders				
Educación, Ambiente y Ecoturismo, S. de R. L. (EDUECO)	San Pedro Sula	550-4383	Lic. Suyapa Dominguez	Yes
Educación y Ambiente (EDUCA), S. de R. L.	Tegucigalpa, DC.	239-1793 235-6725	Miguel Moncada	No
Cervecería Hondureña Vivero	San Pedro Sula	550-5100	Mauricio Cruz	Yes
Anthony's Key Resort	Roatan, Islas de la Bahia	445-1003 445-1003	Julio Galindo	No
Cocodrilos Continental (CLAL)	San Manuel, Cortes	6704356	Lic. Juan Angel Dubon	Yes
Aqua Corporación Hondureña	Rio Lindo, Cortes	650-4041 650-4035	Ernesto Interiano	No
Granjas Marinas San Bernardo	Choluteca	88.20719	Ing. Carlos Lara	No

#10 UNESCO[40] classification of the Honduran vegetative ecosystems map (CD).

(See CD attached next)

[40] House, Paul and Mejia. 2001. Mapa Ecosistemas Vegetales de Honduras. PAAR/UNESCO/UNAH-DB.