

Biodiversity Support Program



A U.S.A.I.D.-funded consortium of World Wildlife Fund, The Nature Conservancy, and World Resources Institute

REPORT

An Assessment of Biodiversity Conservation in Vietnam and the Lower Mekong River Basin: Ongoing Efforts and Potential for Future Activities

by
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The Biodiversity Support Program (BSP) was established in 1988 with funding from the Research and Development Bureau of the U.S. Agency for International Development (USAID), under cooperative agreement number DHR-5554-A-00-8044-00. BSP is implemented by a consortium of World Wildlife Fund, The Nature Conservancy, and the World Resources Institute. The central purpose of the BSP is to support efforts to conserve biological diversity in developing countries through information networking, pilot implementation projects, research, and analysis of conservation and development techniques.

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USAID's approach to biodiversity will focus on promoting innovative approaches to the conservation and sustainable use of the planet's biological diversity at the genetic, species and ecosystem levels. "Biodiversity" refers to the variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems, and among the ecological complexes of which they are a part. This includes diversity within species, between species, and among ecosystems. We are only beginning to fully understand the economic value and biological underpinnings of biodiverse areas.

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Acronyms and Abbreviations

ADB	Asian Development Bank
BAP	Biodiversity Action Plan
BSP	Biodiversity Support Program
CRES	Centre for Natural Resources and Environment Studies
DARD	Department of Agriculture and Rural Development (provincial-level)
DFD	Department of Forest Development
DOSTE	Department of Science and Technology and Environment (provincial-level)
FIPI	Forest Inventory and Planning Institute
FDP	Forest Development Department
GEF	Global Environment Facility
IEBR	Institute of Ecology and Biological Resources
INGO	International Non-Governmental Organization
IUCN	World Conservation Union
MAB	Man and the Biosphere
MARD	Ministry of Agriculture and Rural Development
MBEPF	Management Board for Environmental Protective Forests of Ho Chi Minh City
MOSTE	Ministry of Science, Technology and Environment
MPA	Marine Protected Area
UNDP	United Nations Development Programme
VNNEAP	Vietnam National Environmental Action Plan
WB	World Bank
WWF	World Wildlife Fund/World Wide Fund for Nature

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Map I -- Provinces and Regions of Vietnam

(All maps can be found in the packet inside the back cover of this report)

Executive Summary

From September 8 to 28, a two person team consisting of an Aquatic Resource Management Specialist and a Terrestrial Resource Management Specialist undertook a three week mission to Vietnam with funding provided by USAID through its global Biodiversity Support Program. The purpose of this mission was to review ongoing and planned *in situ* biodiversity conservation efforts, identify gaps in current efforts and prepare a report that identifies options for potential USAID engagement through International NGOs in biodiversity conservation in Vietnam and its neighboring countries of the Indochina region. This report presents the findings from the mission and makes specific programming recommendations for USAID support to biodiversity conservation in Vietnam and the Indochina region as a whole. This report will provide guidance to a larger and more formal multi-sectoral programming mission to Vietnam planned by USAID for later in the year.

The Indochina region of mainland Southeast Asia is one of the world's richest sources of biological diversity. However, decades of civil conflict combined with economic stagnation, and the international isolation of the region's governments have resulted in the extensive disturbance of ecosystems in many parts of the region. More recently, the gradual opening of the region to foreign investment, has accelerated the exploitation of natural resources through unregulated timber and fuel-wood harvesting, mining, hydro-power development, conversion of marginal lands to commercial agricultural production or commercial fisheries (e.g., shrimp culture), and the use of destructive harvesting methods in inland and offshore fisheries. As a result, international environmental groups have raised concerns over the pace, and the extent to which, the region's biodiverse resources have come under threat of degradation. At the same time, the international donor community has come to recognize that sustainable economic growth and political stability of the Indochina region is, in part, dependent on disciplined management of the natural resource base. The conservation and sound management of the region's natural resources is a matter of global importance.

The Government of Vietnam has demonstrated a serious commitment to biodiversity conservation. Vietnam's first protected area — Cuc Phuong National Park — was established in 1962. Since then, the protected areas system has grown to include more than 80 national parks, nature reserves, cultural history sites encompassing about one million hectares, or three percent of the country's total land area. The Government plans to expand the number of protected areas to 105, and to increase the total protected land area to two million hectares. In 1985, Vietnam adopted a *National Conservation Strategy*, one of the first developing countries to undertake such an endeavor. This pioneering document evolved into the comprehensive *National Plan for Environment and Sustainable Development*. Vietnam signed the Biodiversity Convention in 1992 and ratified the convention in October 1994.

In 1995, Vietnam approved a *Biodiversity Action Plan* that serves to guide and coordinate all Government and donor-supported biodiversity conservation efforts. The document gives emphasis to the fact that Vietnam's high population density precludes the possibility of the Government creating vast protected areas free of human intrusion. Instead, nature reserves will be developed in broader biodiversity landscapes where small protected areas are part of a land-use mosaic with buffer-zones, corridors, plantations, regeneration zones and agricultural lands all managed in ways that help protect the diversity of biological resources.

According to UNDP sources, 83 percent of donor funding for environmental projects in Vietnam for the period 1985 - 2000 (\$389 million) has been committed for the "protection, rehabilitation and management of productive natural resources". **Of this amount, only approximately \$23 million has been explicitly programmed for biodiversity conservation activities.** The pattern of donor commitments is quite similar across all major government agencies administering environmental projects: steady growth in the early 1990s with sharp increases in the middle of the decade. More than two-thirds of environmental commitments have been programmed through the central government agencies that make up the Ministry of Agriculture and Rural Development. A much smaller share of the commitments has been programmed at the provincial- and district-levels. The steady rise in project commitments is taxing the administrative and aid absorptive capacities of all government agencies. As environmental conditions in Vietnam continue to deteriorate, and hence environmental concerns and activities increase, the demand to decentralize assistance delivery, and to direct donor assistance into institutional strengthening activities, will be more pressing.

There have been at least 37 international NGOs implementing agriculture and natural resource management activities in Vietnam, a number of which have been partners with USAID in the delivery of development assistance in other developing countries. A small number of international nature conservation organizations have been active in Vietnam supporting specific biodiversity conservation initiatives such as carrying out biological surveys of specific habitats, promoting awareness and protection of individual animal species, and building government capacity for nature conservation and protected area management. Of these organizations, the two with the longest experience in Vietnam are WWF and IUCN.

Based on interviews with USAID personnel in Washington and in Vietnam, biodiversity conservation specialists and individuals familiar with development assistance programming in general, the Mission Team developed a set of eight criteria for the recommendation of programming options and the identification of specific conservation activities. According to these criteria, a prospective program or activity should:

Promise high biodiversity conservation or environmental protection value — The activity should achieve notable and measurable results in nature protection and conservation.

Promote sustainable livelihoods — To achieve its conservation objectives, the activity should support the sustainable economic development of those populations dependent on the resources affected by the activity.

Build existing national and local capacity — The activity should support established programs, and utilize established implementation structures and strengthen existing institutions at the national, provincial and district levels of government.

Respond to demonstrated Government interest — The activity should have the strong support within the government agency responsible for its implementation to ensure cooperation at all levels of government.

Leverage additional donor support — The activity should encompass conservation and protection issues significant enough to warrant cooperation with other donors and specialized conservation organizations to achieve a common set of objectives.

Utilize established USAID programming vehicles and partners — Because of the complexities of programming development assistance in Vietnam, initial activities should be implemented through existing contracting mechanisms utilizing the county experience of established USAID partners.

Address conservation issues of regional importance — To maximize impact, the activity should have broad conservation implications such as the promotion of transnational protected area management for the conservation of contiguous flora and fauna habitat; or the promotion of watershed protection in the lower Mekong River basin to support regional food security.

Promise high visibility — The activity should be unique and significant from the standpoint of biodiversity conservation (at the national-, regional- and global-levels), and should demonstrate the strong commitment to co-operation between the United States and Vietnamese governments.

It should be noted that the program and activity recommendations of the report do not necessarily meet all of the criteria in every instance. Justification for the recommendations that follow and those that will appear in the body of the report will be addressed in more detail as the report is developed.

During its Mission, the Team identified two issues that are likely to shape, at least in part, any assistance programming agreements between USAID and the Government of Vietnam. The first issue centers on US foreign assistance for what some call “environmental healing.” Environmental healing is a euphemism for program funding that would repair environmental damage that occurred in Vietnam during the war years. It is seen by some as a necessary part of an effort to “heal” relations between the two countries through programs of environmental remediation. The Team members did not offer any opinions on this issue during our field visits and in our interviews.

The other issue centers on the question of whether USAID needs to abide by a rough geographic balance between funding efforts in the North and South. While the South is generally more prosperous than the North, there is a fear expressed by some that the U.S. tendency would be to focus its funding in the South. It should be obvious here that if environmental healing were to be adopted as a theme, the South would in fact likely receive substantial funding consideration. As with the issue of environmental healing, the Team took no position on this issue. We have, however, given them serious consideration in developing our program and activity recommendations, and both issues were discussed during the briefing of USAID staff and BSP staff held in Washington at the end of the Team's field visits.

Based on the above criteria and considerations, the Mission Team has recommended USAID support for the following programs:

I. Expansion and strengthening of terrestrial protected areas management.

While there is significant donor support for improving the natural resources management in Vietnam, there are few activities that link resource management strategies with resource conservation strategies. The activities identified under this program heading combine training and capacity building efforts with practical applications in integrated conservation and development. The recommended activities also contribute to building multi-national linkages within the region to support the management of trans-boundary conservation efforts.

II. Development of a marine protected area system.

There is, as yet, little donor support for the conservation of marine biodiversity in Vietnam. Nor is there a clear institutional context for managing marine conservation activities within the Government. The activities identified under this program heading seek to combine existing capacity to create a government institution responsible for the protection and conservation of marine biodiversity.

Under the program heading of Terrestrial Protected Areas, the Team has recommended three activities:

- ***Strengthening the curriculum of the Xuan Mai Forestry College*** — an activity with potential national impact, the focus of the activity is to upgrade the skills of current and future Forest Department personnel responsible for protected area management in forest and wildlife ecology, protected area management, and community-based resource management.
- ***Integrating conservation and development in the Western Quang Nam Nature Reserve*** — an activity with high biodiversity conservation potential, the activity focuses on securing and maintaining the protection of one of Vietnam's largest remaining reserves of primary forest.
- ***Upgrading the status of the Can Gio protected wetlands*** — an activity that indirectly broaches the issue of “environmental healing” through enhanced protection for a largely replanted mangrove forest decimated by Agent Orange, while elevating this important coastal resource to the status of an international Biosphere Reserve.

Under the program heading of Marine Protected Areas, the Team has recommended a single activity:

- ***Assistance in the creation of a Marine Protected Area program with initial site specific emphasis at Nha Trang and/or other areas with similar biodiversity enhancement values*** — an activity that fills a vacuum in national marine resource conservation, and one that could have important consequences for the economic and nutritional requirements of the country by focusing on replenishment zones for depleted and valuable commercial marine stocks.

Within the Indochina regional context, the Team recommends a program that encompasses the lower basin of the Mekong River. Maintenance of the ecological health of the Mekong basin is crucial to mid and long term food security for Vietnam, Cambodia and, to a lesser extent, Laos. A lower Mekong basin program would focus on the need to protect the rich agricultural and fish production values in Vietnam, Cambodia and Laos. Maintenance of these values is consistent with, and beneficial to the following: the protection of transnational terrestrial protected areas; protection of remaining wildlife habitat; the conservation of critical watersheds in the region; the protection of critical wetlands to conserve birdlife habitat and significant breeding grounds for freshwater fisheries; the balance of regional food security with hydro power development to meet energy demands for increased economic growth; and the support for more sustainable livelihoods for the rural poor through the integration of natural resource conservation with small-scale enterprise development.

The Team recommends a regional activity that supports a modeling effort to enable development planners to evaluate the impact of hydro power development (as well as other proposals for significant water withdrawals or diversions) on the hydrology of the lower basin, on the integrity of lower basin ecosystems, and on sustainable agricultural and fisheries production and food security for the region as a whole. The absence of such a model, particularly one that focuses on these most sensitive values in the lower Mekong basin, provides an opportunity for USAID to fill a vacuum that no other donor has filled to date.

Introduction

From 8 to 28 September 1997, a two person team consisting of an Aquatic Resource Management Specialist and a Terrestrial Resource Management Specialist undertook a three week mission to Vietnam funded by USAID through its global Biodiversity Support Program. The purpose of this mission was to review ongoing and planned *in situ* biodiversity conservation efforts, identify gaps in current efforts and prepare a report that identifies options for potential USAID engagement, through International NGOs, in biodiversity conservation in Vietnam and its neighboring countries of Indochina. This report presents the findings from the mission, and makes specific programming recommendations for USAID support to biodiversity conservation in Vietnam and the Indochina region as a whole. This report will provide guidance to a larger and more formal multi-sectoral programming mission to Vietnam planned by USAID for later in the year.

Background

The Indochina region of mainland Southeast Asia is one of the world's richest sources of biological diversity. Three principal biomes make up the region: 1) Cambodia and the neighboring areas of Laos and Vietnam possess the largest remaining contiguous area of primary tropical and mixed forest cover in east Asia, which provides habitat for a large and wide diversity of plant and animal species; 2) Vietnam and Cambodia possess extensive coastal and marine habitats including coral reefs, mangroves and the wetlands of the Red River and Mekong River deltas; and, 3) the lower Mekong River Basin, including Cambodia's great lake, the Tonle Sap, constitutes one of the most productive freshwater fisheries in the world.

Decades of civil conflict combined with economic stagnation, and the international isolation of the region's governments have resulted in the extensive disturbance of ecosystems in many parts of the region. More recently, the gradual opening of the region to foreign investment has accelerated the exploitation of natural resources through unregulated timber and fuel-wood harvesting, mining, hydro-power development, conversion of uplands and wetlands for agricultural and fisheries production, and the use of destructive harvesting methods in inland and offshore fisheries. As a result, international environmental groups have raised concern over the pace, and the extent to which, the region's biodiverse resources have come under threat of degradation. At the same time, the international donor community has come to recognize that sustainable economic growth and political stability of the Indochina region is, in part, dependent on disciplined management of the natural resource base. The conservation and sound management of the region's natural resources is a matter of global importance.

Mission Objectives

Objectives of the mission were threefold:

- to identify the current biodiversity conservation priorities in Vietnam and the relationship of these priorities to biodiversity conservation within the region;

- to review planned and current donor-supported biodiversity conservation activities in Vietnam and related activities in Laos and Cambodia; and,
- to identify, and assess the capacity of, partner organizations that can support the implementation of potential USAID-funded biodiversity conservation activities in Vietnam.

To meet these objectives, the Team reviewed secondary data sources, including national environmental action plans, tropical forestry action plans and biodiversity action plans for each of the three countries in the region, as well as documents related to specific biodiversity and natural resource management activities (a list of references is attached to this report). Because of the short duration of the mission and the difficulty of undertaking field visits at the end of the monsoon season, the Mission confined to country visits to Vietnam and Cambodia, and to field-site visits in Vietnam exclusively.

To assess biodiversity conservation priorities and efforts being made to address those priorities during its country visits, the Team interviewed representatives of public and private agencies responsible for the management of natural resources, tourism, the protection of wildlife, the formulation of nature conservation policy and the implementation of natural resource conservation activities (e.g., government capacity building, community-based resource management, parks and protected area management, and eco-tourism) in Hanoi, Danang, Nha Trang, Ho Chi Minh City and Phnom Penh. Individuals interviewed included government officials, representatives of parastatal organizations, representatives of international and national NGOs, and private contractors that are implementing activities related to nature conservation.

During its Mission, the Team attempted to assess the capacity of these public and private organizations to support potential USAID-funded biodiversity conservation activities with adequate technical and human resources. To do so, Team members supplemented interviews with field site visits to selected ongoing biodiversity conservation activities to assess the implementor's capacity first-hand. (A detailed itinerary, and a list of persons interviewed are attached as annexes to this report).

Comments on the Terms of Reference

The Mission's original Terms of Reference (attached as an annex) were ambitious given the lack of recent experience and country presence of USAID in Vietnam and Laos, and the ongoing suspension of USAID assistance to Cambodia. As the Mission evolved, it became clear that the Team would have to depart from the original Terms of Reference to maximize effectiveness during three weeks in the field. The richness and complexity of the Vietnam context demanded more time for analysis than the Team could afford. This demand, combined with the problems surrounding travel to field sites during the rainy season, precluded all but the most cursory visit to neighboring countries. In addition, the importance of Cambodia to biodiversity conservation and environmental protection in the lower Mekong Basin region gave greater weight to the decision to travel to Cambodia than to Laos. As a result The Team opted to visit Cambodia to meet with natural resource management specialists in Phnom Penh, and to eliminate Laos for the Mission itinerary. Because of the significance of Cambodia's great Tonle

Sap Lake, the Team's travel to Cambodia was essential to any meaningful assessment of biodiversity conservation in a lower Mekong regional context.

Organization of the Report

Section I of this report provides an introduction to the geography, economy and administration of Vietnam as a background for a more detailed review of the status of the country's terrestrial and aquatic resources.

Section II summarizes the major legal and policy instruments that govern biodiversity conservation in Vietnam, and profiles the principal government institutions responsible for their implementation. This section goes on to summarize the major trends of donor support to Vietnam's environment sector, especially nature protection and conservation. The section concludes with a brief review of INGO capacity in biodiversity conservation.

Section III outlines the criteria used by the Mission Team to identify biodiversity conservation program activities for potential support by USAID in Vietnam. Based on Team reviews of available written material, interviews with a broad array of professionals working in the region, and field trips, the Team developed eight specific criteria that can yield tangible and measurable program objectives. In addition, the Team identified a number of less tangible yet nonetheless important issues for USAID to consider in the formulation of any type of development assistance program for Vietnam.

Section IV presents the Team's recommendations to USAID and BSP for potential biodiversity conservation programs and activities specific to Vietnam. These programs are: I) Expansion and strengthening of the management of terrestrial protected areas; and II) Development of a marine protected area system. Following the description of each recommended program, the section identifies one or more specific activities related to that program and, using a matrix format, justifies the recommendation of the activity against the selection criteria presented in Section IV.

Section V presents the Team's recommendations for a regional initiative that encompasses the lower basin of the Mekong River. The recommendations focus on a modeling effort that would enable development planners to evaluate the impact of hydro power development, and other proposals for significant water withdrawals or diversions, on the hydrology of the lower basin, on the integrity of lower basin ecosystems, and on sustainable agricultural production and food security for the region as a whole.

Section VI provides conclusions and recommendations for actions that are intended to follow-up programming recommendations made in this report.

I The Imperative for Biodiversity Conservation in Vietnam

This section provides an introduction to the geography, economy and administration of Vietnam as a background for a more detailed review of the status of the country's terrestrial and aquatic resources.

Background

Vietnam, a mountainous country with a land area about the size of the United Kingdom, it is the world's 13th most populous country (77 million) and one of its poorest. Estimated GDP per capita is \$270. Nearly four-fifths of the country is mountainous, unsuitable for intensive agriculture, and relatively sparsely populated. Tables 1.1 and 1.2 compare selected economic and land use indicators for Vietnam with countries in southeast and east Asia.

With an annual population growth rate of 1.95 percent, a total fertility rate of 3.1 births per woman, and a life expectancy at birth of 67 years, Vietnam adds more than 1.8 million people to its population each year. Nearly 90 percent of the population are ethnic Kinh, having Vietnamese as its mother tongue. The remaining 8 million people belong to at least 50 minority ethnic groups who typically predominate in the mountainous regions of the north and the Central Highlands.¹ The majority of the population is concentrated in the intensively cultivated alluvial plains of the Red River in the north (where population densities are estimated to exceed 1,100 persons per km²) and the Mekong River in the south. Three-quarters of the population live in rural areas, where the amount of cultivated land per capita — 0.09 hectares per person — is among the lowest in the world. While agriculture accounts for approximately 27 percent of GDP, it accounts for 70 percent of the employment and about one-third of the exports.

Table 1.1 — Selected Economic Indicators, Southeast and East Asia (1997)

	Per-capita GDP	GDP Growth	Per-capita GNP	Population (millions)	Population Growth	Life Expectancy	Caloric Intake
Vietnam	\$1,310	9.5	\$270	76.7	2.3	67	2250
Cambodia	\$1,266	6	\$270	10.3	2.5	53	2021
Laos	\$1,670	6.9	\$370	4.9	2.9	52	2630
Thailand	\$8,165	6.4	\$2,970	61.4	1.5	69	2443
Malaysia	\$9,835	8.2	\$4,466	21.3	2.4	72	2884
Japan	\$23,440	2.6	\$33,090	126	0.3	80	2956

Source: *Asiaweek*, 5 September 1997

¹ Vietnam is divided into eight agro-ecological zones distinguished by variations in climate, topography and land form types. These zones are: Northern Mountains, Northern Midlands, Red River Delta, North Central Coast, South Central Coast, Central Highlands, Northeast Mekong and Mekong Delta.

Table 1.2 — Comparison of Land Area and Land Use in Southeast and East Asia

	Land Area (000 ha)	Persons per 1000:ha	Persons per ha of Cropland	Land Use			
				Cropland	Pasture	Forest	Other
Vietnam	32,549	2190	11.5	19.6	1.0	20.9	30.5
Cambodia	17,652	583	4.0	17.3	3.3	62.0	17.4
Laos	23,080	21	6.0	8.9	6.5	47.0	37.6
Thailand	51,809	1,185	2.8	45.2	1.6	27.6	25.6
Malaysia	32855	613	4.0	14.8	.2	61.9	23.1
Japan	37652	3322	25	11.9	.5	66.8	20.8

Source: WRI, 1996

Vietnam is made up of 65 provinces (including four municipalities), the principal sub-national administrative unit. These, in turn, are divided into more than 400 districts. Districts are made up of communes, the lowest level of political administration, each of which comprises a number of villages. At each level of administration, a People's Committee made up of members elected from the administrative unit constitutes the political and administrative authority of the central government. Parallel to the structure of political administration is the Communist Party, with cadres at each administrative level. Party members are said to wield enormous political influence in policy making at all levels of government.

In 1986, the Communist Party initiated a process of economic liberalization called *doi moi* ("new thinking"). Among the key reforms of the ongoing *doi moi* have been the de-collectivization of the agriculture sector, the devaluation of the Vietnamese dong and unification of exchange rates, the relaxing of most price controls, a tightening of budget constraints on state owned enterprises, the development of a two-tiered banking system, and a liberalization of restraints on foreign direct investment, official development assistance and external trade. Largely as a result of this economic liberalization, Vietnam quickly moved from being a net rice importing country to a net rice exporting country, with rice exports becoming the country's biggest source of hard currency. Other results of *doi moi* include: growth rates that have averaged eight to nine percent over recent years, implying annual growth in average annual per-capita income of seven to eight percent; a reduction of the national budget deficit and inflation (annual inflation has been running in the single digits, as opposed to the triple digit inflation rates of the pre-*doi moi* period); and a reduction of poverty rates by more than an estimated 35 percent since the mid-1980's.

Due to this economic growth, Vietnam's burgeoning population and its dependence on agriculture is creating enormous pressure on the country's remaining stands of natural forests and wetland ecosystems. The situation is so critical that the country's 1995 Biodiversity Action Plan (BAP) explicitly recognized that Vietnam's population density precludes the possibility of creating large protected areas free of human intrusion. Rather, the BAP calls for the development of broader biodiversity landscapes where small protected areas are part of a land-use mosaic with buffer-zones, corridors, plantations, regeneration zones and agricultural lands. All managed in ways to help protect the diversity of biological resources, the livelihoods of populations are dependent on those resources.

Vietnam's Biological Diversity

With its wide range of latitudes, altitudes and land forms, Vietnam supports great diversity of natural ecosystems and species diversity in a variety of ecosystems. These ecosystems range from a broad spectrum of forested habitats to coastal/aquatic ecosystems, shrub- and grasslands interspersed among cropland and settlement areas. Two important sources of detailed information on Vietnam's biodiversity are the *Biodiversity Action Plan* and the draft *National Environmental Action Plan*. The following summary descriptions of Vietnam's major ecosystems are taken directly from these two sources.

Terrestrial Resources

The diversity of forest ecosystems range from lowland evergreen rain forest rich in Dipterocarpaceae in the southern part of the country to deciduous forests in the northern part of the country to dense evergreen forests in the uplands. These forests contain a wealth of plant species, many of which are endemic and confined to small geographical ranges and occur in low numbers. Some 7,000 of an estimated 12,000 species of higher vascular plants have been identified in the forests, many of which are used for food, medicines, animal fodder, wood, oil, and other purposes. Of the identified vascular plants, ten percent are believed to be endemic to Vietnam. Six out of eight centers of plant species diversity in East Asia identified by the International Union for the Conservation of Nature (IUCN) are located in Vietnam. The forests of Vietnam also contain the highest avian and primate diversity in mainland Southeast Asia (comprising Myanmar, Thailand, Laos, Cambodia, and Vietnam). Of the 34 globally threatened birds identified as occurring in Vietnam, ten are restricted range, endemic forest species. In addition, of the 20 primate species in Vietnam, four are endemic.

Deforestation, or forest habitat loss, may be the most important contributor to the loss of biodiversity in Vietnam. While the percentage of total forest loss in Vietnam is comparable to its neighboring countries, only 20 percent — or two million hectares — of the country's estimated primary forest remains compared to 43 percent for Thailand, 55 percent for Laos, and 71 percent for Cambodia (see Map II for an illustration of remaining primary forest cover in Indochina). Primary forests are the most species-rich ecosystems; and the Government is making a concerted effort to slow, and eventually halt, the degradation of remaining forests through reform of national forest management practices.

Forest degradation has many forms in Vietnam. In terms of overall tree loss, fuelwood demand is the most significant form of degradation, accounting for more than six times the losses from commercial logging in area-equivalent terms. However, fuelwood is often

scavenged from selected trees, so that the contribution of fuelwood removal to the degradation of forest land is less significant than commercial logging operations that tend to clear cut forest blocks. Since the mid-1970s, Government-sponsored resettlement programs — that provided incentives for lowland farmers to migrate to less densely populated upland areas — have also contributed to significant degradation of forest lands. Most migrating farmers had little familiarity with upland farming systems. Their application of familiar lowland farming practices to sloping land led to rapid soil depletion, and forced farmers to open up new forest lands for cultivation. In terms of the evolution of barren lands and land degradation, sedentary shifting cultivation (rotational fallow systems that affect up to one million hectares per year) is the most extensive cause, and it is often linked to the onset of forest fires. The "true" shifting cultivation (practiced by the itinerant or swidden cultivators), which affects approximately 180,000 hectares, is less degrading to soil conditions.²

Forest area degradation has important implications for ecosystem integrity and the loss of valuable biodiversity. The value of biodiversity is, however, difficult to assess. No attempts have yet been made, for example, to estimate the contingent value of eco-tourism in the protected areas/national parks. In terms of quasi-option or existence values (i.e., the value of preserving options for future use in the expectation that valuable knowledge will grow with time), the discovery of three new mammalian species within the past two years in the north-central forest reserves (compared to the last known world discoveries in 1906 and 1937) indicates the potential for high existence value from these forests. Moreover, with 40 percent of Vietnam's flora species believed to be found nowhere else in the world, and with 28 percent of the mammals, 10 percent of the birds, and 21 percent of the amphibia and reptiles that are listed as endemic species currently on the endangered species list, the importance of biodiversity protection in important reserve forests is indisputable.

Another major cause of biodiversity loss in Vietnam is the trade in wildlife and non-timber forest products. The increasing trade in reptiles, monkeys and birds, as well as in edible and medicinal plants, is a serious threat to the survival of many fauna and floral species. A number of marine species are also thought to be facing severe over-exploitation, including sea turtles, lobsters, sea cucumber, and coral. The principal markets for plant and animal wildlife are thought to be China, Thailand and Singapore, and the trade is thought to be largely illicit (i.e., wildlife, and wildlife products are typically smuggled out of the country). Although Vietnam acceded to the Convention on International Trade in Endangered Species (CITES) in 1994, there is no single Government department directly responsible for the control of the wildlife trade. As a result, there are insufficient reliable data to document the extent and trends of the trade.

² According to the VNNEAP, *sedentary shifting cultivators* include most of the rural population outside of the Mekong and Red River deltas (perhaps 15-16 million people, or nearly 70 percent of the non-itinerant population in the hill/mountain areas). They have fixed households but shift cultivation sites. Relatively little direct loss of primary forest can be attributed to this activity compared with new land development associated with the land settlement program. However, this method of cultivation has caused serious land degradation problems due to over-cultivation *in-situ*, and is the primary factor preventing regeneration of natural forest on the barren lands.

Map II – Proposed and Established Nature Reserves and National Parks in Cambodia, Laos and Vietnam

(All maps can be found in the packet inside the back cover of this report)

Map III Proposed and Protected Areas in Cambodia, Laos, and Vietnam

(All maps can be found in the packet inside the back cover of this report)

Wetland and Marine Coastal Ecosystems

Vietnam possesses 3,260 kilometers of coastline on the South China Sea, and one million kilometers of territorial waters characterized by a wide range of wetland and marine coastal ecosystems. Wetland ecosystems include large estuaries and delta systems with extensive mangrove swamps and tidal mudflats, seasonally inundated inland marshes and coastal sand dune areas with brackish and saline lagoons. Vietnam's marine life, especially fish species, is highly diverse due to its wide latitudinal range. The largest, and perhaps one of the world's most prolific wetland ecosystem, is found in the Mekong Delta in the South. The South Central Coast contains numerous rugged capes, bays, and rocky cliffs with some near-shore coral reefs and larger, deeper coral reefs aggregated offshore. Significant coastal lagoons and extensive sandbanks dominate the North Central Coast. Further north, they are replaced by a low and swampy coastline integrating mudflats and mangrove stands, particularly around the Red River Delta.

These ecosystems provide direct economic benefits, particularly in supporting agriculture and forestry, as well as indirect services to humans. Mangrove swamps and estuaries have special ecological significance as spawning, nursing and feeding grounds for numerous species of economically important fish and shellfish. Coral reefs concentrate nutrients to support fisheries in the surrounding sea. Dunes, mangrove forests, and coral reefs present natural buffers against flooding, erosion, and storm wave damage. Wetland and marine coastal ecosystems also provide habitats for a great variety of plant species and wildlife. The coastal wetlands, for example, serve as important staging and wintering habitats for at least 100 species of migratory waterfowl. The Red River Delta offers wintering grounds for the rare Black-faced Spoonbill, *Platalea minor* and the Saunders' Gull, *Larus saundersi*. The Plain of Reeds in the Mekong Delta harbors the almost extinct E. Sarus Crane, *Grus antigone sharpii* and several other rare species such as the Black-necked Stork, *Ephippiorhynchus asiaticus*.

Similar to other countries in the Asia region, these wetland and marine coastal ecosystems are being converted or degraded rapidly. Although large areas of wetlands, particularly mangroves, were lost during the war, recent economic pressures to convert wetlands for agriculture, aquaculture, and urban developments are accelerating their destruction and un-economical use. Coastal fisheries are being over-exploited and coral reefs depleted by the use of destructive fishing methods. Since the majority of Vietnam's population, agricultural production, and industrial development are concentrated in the coastal area and the Red River and Mekong River delta systems, urban and industrial pollution — as well as the effect of other development activities located in catchment areas — pose a serious threat to coastal and marine resources. The expected growth in economic activity, particularly agricultural intensification, water resource use, industrial development, increased shipping activities, and intensified commercial fishing, will further increase the pressure on wetland and/or marine coastal ecosystems in forthcoming years. Map 3 illustrates the loss of mangroves along Vietnam's coast and the vulnerability of offshore fisheries to oil spills.

The loss of wetland forests (mangroves in the coastal areas or back mangroves further inland) of the Mekong Delta is in many ways more serious than that of the upland forests and watersheds. As much as 40 percent of the natural fishery nurturing functions of mangroves has been lost through the expansion of shrimp ponds and the subsequent abandonment that characterizes the extensive "shifting aquaculture" practiced in the acid sulphate soil areas. In

Bac Lieu and Ca Mau provinces (formerly Min Hai Province), which account for about half of all the mangroves in Vietnam, nearly 55 percent of mangrove forests were destroyed between 1982 and 1992, mostly for shrimp aquaculture. By 1993, only 38 percent of the mangrove forests that existed in the province remained intact from the onslaught of shrimp pond development. Furthermore, if this ratio applies to mangrove wetlands in the whole of the Mekong Delta, the Red River Delta and the Northeast Region, then coastal aquaculture development is responsible for the destruction of some 148,000 hectares of mangrove forests.

Map IV — Coastal Mangrove Degradation and Oil Spill Sensitivity

(All maps can be found in the packet inside the back cover of this report)

II Government and Donor Support for Biodiversity Conservation

This section summarizes the major legal and policy instruments that govern biodiversity conservation in Vietnam, and profiles the principal government institutions responsible for their implementation. This section goes on to summarize the major trends in donor support to Vietnam's environment sector, especially nature protection and conservation. The section concludes with a brief review of INGO capacity in biodiversity conservation.

Legal and Policy Framework Supporting Biodiversity Conservation

The Government of Vietnam has demonstrated a serious commitment to biodiversity conservation. Vietnam's first protected area — Cuc Phuong National Park — was established in 1962. Since then, the protected areas system has grown to include more than 80 national parks, nature reserves, and cultural history sites now existing under the Forestry Protection and Development Act of 1991. In 1985, Vietnam adopted a *National Conservation Strategy*, one of the first developing countries to undertake such an endeavor. This pioneering document evolved into the comprehensive *National Plan for Environment and Sustainable Development* that brought together relevant policies of the central planning and the line ministries. Vietnam signed the Biodiversity Convention in 1992 and ratified the convention in October 1994. The present protected areas system covers about a million hectares. However, in order to ensure that the protected areas system represents all of Vietnam's habitat types, and is adequate to offer suitable protection for Vietnam's natural heritage, the Government recently supported a proposal to double the size of the protected areas system to about two million hectares and to increase the number of protected areas to 105. The proposal originated with the national Forest Protection Department in August 1996 as an activity of the *Biodiversity Action Plan*, and is part of Vietnam's effort to implement the Convention on Biological Diversity.

Beginning in 1994, the Government undertook revisions of its national forestry policies. These initiatives had important implications for the management of natural resources and protected areas. Two of the most important initiatives include:

Law on Land (1993): In line with economic reforms, the initial 1987 Land Law placed greater emphasis on households as the basic unit of production, and initiated a program to reallocate 9 million hectares of former state forest land primarily to family units. The new Law on Land passed by the National Assembly in July 1993 focuses on the allocation and uses of non-forestry land. The land-use plans form the basis for land allocation to households, and land tenure for agriculture and aquaculture.

Forestry Protection and Development Act: Enacted by the National Assembly in 1991, this law establishes special use areas for National Parks, certain forests for watershed protection, and certain areas as protected forest for hydroelectric watersheds. Specifically, the revised forestry policies aim to:

- establish a system of protected forests of approximately 6 million hectares;

- establish nature reserves (special use forests) totaling 2 million hectares; zoned for emphasis on the development of sustainable use zones to support local communities;
- establish 11 million hectares of production forests; and
- attain a nationwide forest cover of 40 percent (from the current 20 percent).

A major result of both these initiatives has been to shift responsibility for forest management and protection to local communities. Following this principle of decentralization of forest management authority, administration of the district and provincial Forest Protection Departments recently shifted to the respective People's Committees³ at the provincial and district levels. It is this new emphasis on people's participation that creates the opportunity for promoting integrated conservation and development programs related to the management of protected areas in Vietnam.

In an effort to address the problem of forest degradation due to unsustainable forestry and forest-use practices and to meet the economic needs of the Vietnamese people, the Government issued legislation — known as Decision No. 327 — in September 1992. The Decision is to guide policies on the use of bare lands, denuded hills, forests, and flood plains, to address land allocation, and to strengthen agricultural extension, health and education services in barren land areas. The specific objectives of Decision No. 327 are to:

- Protect remaining forests in areas where ethnic people still practice shifting cultivation.
- Allocate state lands and provide financial resources to local people who will then act as stewards in protecting and managing these forest lands for State use.
- Reforest barren lands and hills with indigenous tree species and cash crops for long-term protection through agroforestry approaches.
- Promote forest protection and reforestation of barren lands and hills to address problems of shifting cultivation.

Decision No. 327 is implemented through forest plantation projects based on barren land use, through the socio-economic development plans in relevant sectors, and directly by provincial authorities.

In addition to these instruments related to natural resources management, two major planning instruments have been developed in the last five years that articulate the Government's policies related to the conservation of biologically diverse resources. These are the Biodiversity Action Plan and the National Environmental Action Plan.

³ Government Decree No. 39/CP, regarding the organization, tasks and authority of the Forest Protection Department, 18 May 1994. This decree also places authority for the management of National Parks directly under the control of the Forest Protection Department of the Ministry of Agriculture and Rural Development in Hanoi.

Biodiversity Action Plan

The Vietnam Biodiversity Action Plan (BAP) was approved by the Government in December 1995. The BAP was formally presented at a conference of national and international experts in May 1996, which provided the Government with the opportunity to mobilize additional support for projects in the forestry and biodiversity sectors. The key features of the BAP include:

- Recognition that Vietnam's high population density precludes the possibility of the Government creating large protected areas free of human intrusion. Instead, nature reserves will be developed in broader biodiversity landscapes where small protected areas are part of a land-use mosaic with buffer-zones, corridors, plantations, regeneration zones and agricultural lands all managed in ways that help protect the diversity of biological resources.
- Recognition that, as Vietnam restructures the linkages between central, provincial and lower-level systems of regional government, there is a need to identify provincial-level responsibilities for biodiversity conservation and funding, and a more bottom-up approach for solving biodiversity conservation problems.
- Recognition of three new elements of biodiversity conservation in Vietnam, namely marine conservation, wetlands conservation and conservation of agricultural biodiversity.
- Recognition of the international aspects of biodiversity protection and clarification of Vietnam's responsibilities to its neighbors.
- Recognition of the value and uses of biological resources for Vietnam's long-term economic development.

The Government decision approving the BAP authorizes the investment of State resources in the five-year plan from 1996-2000 to be focused on a number of priority areas: 1) the strengthening of policies and regulations related to biodiversity conservation; 2) the creation of additional protected areas that include specialized forests, wetlands, coastal areas and islands; 3) the improvement of public awareness concerning the protection of natural resources; 4) the training and general capacity building of relevant government staff; and, 5) the promotion of scientific research to conserve the long-term value of biological resources.

National Environmental Action Plan

Following the adoption of the *National Plan for Environment and Sustainable Development* in 1991, the Government, with World Bank support, initiated preparation of a Vietnam National Environmental Action Plan (VNNEAP). The process of producing the VNNEAP was implemented in three phases. The first phase reviewed the country's environmental conditions and proposed a number of priority areas for investment and technical assistance. The second phase consisted of a national review of these proposed environmental priorities. The third phase, which began in late 1994, consisted of a synthesis of the results of the first two phases and an extensive review process of the proposed plan by working groups

and review workshops in different regions of the country. The outcome was a strategic action plan for Vietnam's current and future activities in environmental management.

VNNEAP identifies three program areas :

- Protect, rehabilitate, and manage productive natural resources;
- Control urban and industrial pollution; and
- Strengthen institutional arrangements for environmental management.

Each of these three areas has up to six program categories that are meant to serve as a guide to planning and implementing environmental protection and management activities, and to coordinate international donor activities (see Table 2.1 below). The VNNEAP was submitted by Ministry of Science, Technology and Environment to the Government in July 1995 for approval. However, no approval has been forthcoming to date.

Institutional Framework for the Protected Area Sector

The principal government agencies concerned with biodiversity conservation and protected area management are described below. In general, national parks are administered by the central government, and nature reserves are administered by the provinces. However, this arrangement varies from province to province, and all funds for operating protected areas are disbursed through the Finance Department of the province in which the protected area is located. This arrangement gives the Provincial People's Committee a degree of management responsibility over protected areas within its domain.

Ministry of Agriculture and Rural Development (MARD)

In October 1995, the Government merged the Ministry of Forestry, the Ministry of Agriculture and Food Industry, and the Ministry of Water Resources into a single new ministry called the Ministry of Agriculture and Rural Development. This merger strengthened the potential to coordinate and conduct agricultural extension services critical for integrated conservation and development projects. Within the new MARD, the Forest Protection Department (FPD) has broad management responsibility for the 19 million hectares of Vietnam's land area designated as *state forests*.

At the Provincial- and District-levels, day-to-day management of forest and agricultural lands outside the special-use forest reserves and national parks lies with the district and provincial level forestry administrations (DARD - Department of Agriculture and Rural Development and Sub-FPDs - Provincial-level Forest Protection Departments), with FPD and other MARD departments from the central level providing technical guidance and specialist services. Involvement of these key provincial and district level offices in protected area management activities is essential.

Ministry of Science, Technology and Environment (MOSTE)

The Ministry of Science, Technology and Environment (MOSTE) is responsible for coordinating biodiversity conservation activities in Vietnam as stipulated in the Prime Ministerial Decision for implementation of the *Biodiversity Action Plan*. Through its network of Provincial-level Departments of Science, Technology and Environment (DOSTE), MOSTE can assist FPD and the relevant district and provincial authorities with policy guidance and environmental technical support. Within MOSTE, the National Environmental Agency (NEA), is the department responsible for biodiversity conservation and environmental management.

Other Related Agencies and Institutions

Several other agencies are relevant in assisting FPD and MARD to complete protected area management plans, surveys, and other assessment and monitoring activities, most notably the Forest Inventory and Planning Institute and the Institute of Ecology and Biological Resources.

The **Forest Inventory and Planning Institute (FIPI)** is a semi-autonomous institute within MARD. Its primary functions are: to monitor the status of forest cover throughout the country; to survey, inventory and research forest areas, particularly botanical aspects; and, to prepare field plans and management plans for protected areas and other special use forests in Vietnam. FIPI has a number of branches in all regions of the country, and its professional staff number over 500.⁴

FIPI is typically the agency that prepares protected area management plans, working cooperatively with the Forest Protection Department. In Vietnam, the protected area management plan is the document that defines the boundaries of a protected area, sets out different management zones within the area (core, administration, regeneration, multiple use, etc, although the specific management regulations for these various zones are not well defined), sets staffing levels, and determines infrastructure and other investment needs. Perhaps the single most important aspect of the management plan is that it authorizes an operating budget for the protected area. Once the management plan is completed and has been approved by FPD and MARD, it is submitted to the Office of Government for final approval. Government approval releases funds requested for operating the protected area.

The **Institute of Ecology and Biological Resources (IEBR)** is one of 17 government training, research and development facilities within the National Centre for Natural Sciences and Technology. Founded in 1990, IEBR has a staff of 116 scientists who provide technical support to government line ministries in the areas of biology, zoology, ecology and general environmental science. IEBR is the principal source of national

⁴ Recent Government reforms that emphasize decentralization have forced institutes such as FIPI to become more financially self-sufficient. Much of FIPI's present operations are financed through service contracts with MARD and its various departments, including the Forest Protection Department.

technical expertise for biodiversity conservation planning and implementation; and its staff collaborate with a number of international nature conservation organizations currently active in Vietnam including WWF, Fauna and Flora International, International Crane Foundation, Wildlife Conservation Society and BirdLife International.

Donor Programming in Biodiversity Conservation and Natural Resources Management

According to United Nations Development Programme (UNDP) sources, donor assistance to Vietnam has increased considerably in recent years. This rate of increase is even more marked in the environmental sector. In an effort to track and coordinate donor activities in the sector, UNDP maintains a project database whose structure largely conforms to that of the National Environmental Action Plan, with fourteen programs organized in the three program areas noted above. A recent report generated from that database, the *Compendium of Environmental Projects in Vietnam — 1985-1995*, lists 252 completed, current and pipeline projects that amount to \$466 million.⁵ While the *Compendium* is not exhaustive, it does provide a useful overview of approaches and trends in donor assistance to the sector. UNDP is currently collaborating with IUCN in the preparation of an update of the *Compendium* through 1997. The *Compendium* is an essential reference for future program planning.

Eighty-three percent of the funding for environmental projects accounted for in the *Compendium* (\$389 million) is dedicated to the VNNEAP Program Area One: Protect, Rehabilitate and Manage Productive Natural Resources. **Of this amount, only approximately \$23 million has been explicitly programmed for biodiversity conservation activities.** Table 2.1 provides a breakdown of this funding by program category. The *Compendium* includes many small technical assistance projects alongside a number of much larger investment and food aid (e.g., food-for-work) projects — a feature that tends to skew the analysis of support to the sector. In addition, individual projects are coded to match the most applicable VNNEAP program category description, a feature that can misrepresent the true objectives of a specific activity. For example, the third largest project listed in the *Compendium*, a six-year, \$23 million World Food Programme *Reforestation in Coastal Vietnam* project has been included in Program 1.1 — Upland Conservation for Biodiversity and Watershed Protection. However, the emphasis of the WFP project is largely on dune stabilization and forest plantation of a limited number of tree species rather than true “biodiversity conservation”.

Nevertheless, the *Compendium* does highlight some significant trends in donor support to the environmental sector in Vietnam, including:

- Multilateral Donors account for 53 percent of the commitments to the sector, Bilateral Donors for 41 percent, and INGOs for 6 percent of the commitments;

⁵ Approximately two-thirds of this amount is grant assistance, and one third loan assistance. Asian Development Bank loan commitments for flood control, and urban water supply and sanitation infrastructure alone amount to \$125 million.

- Upland Forest/Watershed Management and Coastal Zone Management dominate multilateral commitments, accounting for 77 percent of total multilateral commitments to the entire environment sector. Bilateral donors are more active in the VNNEAP Program Area II: Control of Urban and Industrial Pollution. INGOs largely focus on "grassroots" activities in sustainable agriculture and improved natural resources management in upland and coastal areas — programs 1.1, 1.2, 1.5, and 1.7 account for nearly all NGO commitments
- The Ministry of Agriculture and Rural Development is responsible for more than two-thirds of the value of the projects listed in the *Compendium* database, with a combined total funding of \$321 million.

Table 2.1 – Donor Funding for Natural Resource Conservation and Management in Vietnam, 1985-1995 (including pipeline)

VNNEAP Program	No. Projects	Funding (\$000)	% Total
1.1 Upland Conservation for Biodiversity and Watershed Protection	50	\$181,665	50.0%
1.2 Development and Improvement of Livelihood and Income-generating Potential in the Hills or Upper Watersheds	28	\$61,493	16.0%
1.3 Reduce the Demand of Wood as Fuel and Improve Energy Efficiency	6	\$657	0.2%
1.4 Protect, Rehabilitate and Manage Mangroves and Inland Marshes	15	\$8,095	2.0%
1.5 Stabilize the Coastline of Vietnam and Improve Disaster Management and Protection from Typhoons	56	\$105,762	27.0%
1.6 Protect Coral Reefs by Designating Specific Coral Reefs as Marine Parks	2	\$6,150	1.5%
1.7 Encourage Use of Sustainable Agricultural Practices and Rural Development	44	\$24,935	6.3%
Totals	201	\$388,757	100.0%

The *Compendium* authors note that the pattern of donor commitments is quite similar across all major Government agencies administering environmental projects: steady growth in the early 1990s with sharp increases in the middle of the decade. This rise in project commitments is taxing the administrative and aid absorptive capacities of these agencies. As environmental conditions in Vietnam continue to deteriorate, and hence environmental concerns and activities increase, the demand to direct donor assistance into institutional strengthening activities will be more pressing.

Biodiversity Conservation and International NGOs

As noted above, considerable donor resources have been invested and earmarked for natural resources management in Vietnam, particularly for farm forestry and watershed management. There are at least 37 international NGOs implementing agriculture and natural resource management activities in Vietnam. The success of the GTZ-supported Social Forestry Development Project in the Song Da watershed (northwestern Vietnam) in terms of agricultural and forest land allocation and management by rural communities has encouraged a number of donors to adopt the model for replication in other areas of the country. Both Save the Children USA and UK have been active in mangrove plantation in the southern coastal areas of the country. Since 1990, CARE International has supported community forestry programs in Ha Bac Province north of Hanoi. These, and other community-based resource management activities, provide important lessons-learned for the development of protected area management strategies, including buffer zone management.

A small number of international nature conservation organizations have been active in Vietnam supporting biological surveys of specific habitats, promoting awareness and protection of individual animal species, and building government capacity for nature conservation and protected area management. The two organizations with the most experience in Vietnam are WWF and IUCN.

In the Lower Mekong region, WWF has been supporting nature conservation projects in Vietnam since 1985, in the Lao P.D.R. since 1989 and in Cambodia since 1991. In Vietnam, WWF's work has focused on surveys and inventories, conservation planning, and capacity building. Notable among WWF's achievements is the scientific description of three previously unknown large mammal species, the saola, the giant muntjac and the Truong Son muntjac. In the area of capacity building, WWF is implementing the UNDP Global Environment Facility (GEF) Project which provides training for conservation officials in a variety of field courses, international study tours, and graduate fellowships. WWF also collaborated with IUCN to assist the Government of Vietnam prepare its national Biodiversity Action Plan. WWF field implementation has focused on the integrated conservation and development project (ICDP) methodology and utilizing participatory approaches to involve local communities in all aspects of conservation planning and management. WWF has successfully introduced this methodology in its projects at Vu Quang Nature Reserve and Bach Ma National Park. Together with CARE International, WWF will apply this methodology to the implementation of the Cat Thien National Park ICDP.

IUCN has been active in Vietnam since 1991 providing technical and capacity building support to the National Environment Agency of MOSTE. As part of this support, IUCN, in collaboration with WWF, participated in the drafting of the Government's Biodiversity Action Plan. IUCN has provided technical support to the Government for the development of protected area bufferzone management, and has begun supporting a Non-Timber Forest Product Research Center within the Xuan Mai Forestry College in Hanoi. With funding from GEF, IUCN supports a southeast Asia regional program in wetlands management.

Several other international conservation organizations have been active in Vietnam. These include the International Crane Foundation, Fauna and Flora International, BirdLife

International, the Wildlife Conservation Society, Ecologically Sustainable Development and the U.S. Fish and Wildlife Service.

The national NGO sector in Vietnam remains undeveloped. There is only one established non-government environmental advocacy organization in the entire country – the Ecology Economy Institute or “Eco-Eco” – which implements small-scale sustainable agriculture projects in a number of “eco-villages.” Technical and field implementation capacity remains exclusive to government- and university-based research institutes. Reference has been made to the Institute of Ecology and Biological Resources (IEBR) within the National Centre for Natural Sciences and Technology. Other important national institutes include the Institute of Oceanography (Nha Trang) for coastal and marine research, and the Institute of Tropical Biology (Ho Chi Minh City).

One of the most active of the university-based research institutions is the Center for Natural Resources and Environmental Studies (CRES) of the Vietnam National University in Hanoi. In collaboration with international NGOs, CRES maintains active programs in upland agro ecosystems and sustainable rural development (with support from the East-West Center), biodiversity conservation research (with support from WWF) and Mangrove Ecosystem Research (with support from IUCN). Two relevant research activities that are currently being undertaken by CRES in collaboration with WWF are a set of case studies of the socio-economic root causes of biodiversity loss in three protected areas; and a major review of the protected area sector in Vietnam funded by DANIDA that will result in a revision of the framework for protected area management for the entire country. The results of this research will be important references for any future mission developing biodiversity programming in Vietnam.

III Criteria for Selection of Potential Biodiversity Conservation Activities

This section outlines the criteria used by the Mission Team to identify biodiversity conservation program activities for potential support by USAID in Vietnam. The Team developed eight specific criteria that can yield tangible and measurable program objectives. In addition, the Team identified a number of less tangible yet nonetheless important issues for USAID to consider in the formulation of any type of development assistance program for Vietnam.

Selection Criteria

Based on interviews with USAID personnel in Washington and in Vietnam, discussions with biodiversity conservation specialists, individuals familiar with development assistance programming in general, and field trips, the Mission Team developed a set of eight criteria for the recommendation of programming options and the identification of specific conservation activities. The criteria are as follows:

Promises high biodiversity conservation or environmental protection value — The program/activity should achieve notable and measurable results in nature protection and conservation.

Promotes sustainable livelihoods — To achieve conservation objectives, the program/activity should support the sustainable economic development of those populations dependent on the resources affected by the activity.

Builds existing national and local capacity — The program/activity should support established programs, and utilize established implementation structures and strengthen existing institutions at the national-, provincial- and district-levels of government. Activities that require the creation of “new” institutions for management and implementation risk the resistance of the central government.

Responds to demonstrated Government interest — The program/activity should have the strong support within the government agency responsible for its implementation to ensure cooperation at all levels of government. To secure this support, the design of the activity must be sensitive to political, administrative and technical jurisdictions and the competition for resources at all levels of government including: regional rivalries (e.g., North vs. South); administrative rivalries (e.g., central government vs. provincial governments) and institutional rivalries (e.g., MARD vs. MOSTE; DFP vs. DFD).

Leverages additional donor support — The program/activity should encompass conservation and protection issues significant enough to warrant cooperation with other donors and specialized conservation organizations to achieve a common set of objectives. The participation of additional donors and organizations will multiply the

impacts of USAID's investment, enhance the visibility of the conservation efforts, and promote Government support and the sustainability of the activity.

Utilizes established USAID programming vehicles and partners — Because of the complexities of programming development assistance in Vietnam, the program/activity should be implemented, at least initially, through existing contracting mechanisms utilizing the in-country experience of established USAID partners. USAID's global and Asia regional environmental contracts and cooperative agreements, including the Biodiversity Support Program, the Biodiversity Conservation Network of the US-Asia Environmental Partnership (USAEP), and the Coastal Resources Management, Forest Resources Management, and Environmental Policy activities, represent flexible and ready mechanisms for accessing technical assistance for the design and implementation of activities. WWF, the East-West Center, Ecologically Sustainable Development and CARE International are among a number of NGOs that have been partners with USAID elsewhere around the globe with an institutional presence and experience in Vietnam.

Addresses conservation issues of regional importance — To maximize impact, the program/activity should have broad conservation implications such as the promotion of transnational protected area management for conservation of contiguous flora and fauna habitat; or the promotion of watershed protection in the lower Mekong River basin to support regional food security.

Promises high visibility — The program/activity should be unique and significant from the standpoint of biodiversity conservation (at the national-, regional- and global-levels), and should demonstrate the strong commitment to co-operation between the United States and Vietnamese governments.

Additional Programming Considerations

During its Mission, the Team identified two issues that are likely to shape, at least in part, any assistance programming agreements between USAID and the Government of Vietnam. The first issue centers on what some call "environmental healing." Environmental healing is a euphemism to suggest that funding consideration should be given to repair environmental damage that occurred in Vietnam during the war years. It is seen by some observers as a necessary part of an effort to "heal" relations between the two countries through a program of environmental remediation, protection, and conservation. The Team members offered no opinion on this issue during our interviews and field visits.

The second issue centers on the question of whether USAID, in its funding deliberations, should abide by a rough geographic balance between the North and the South. As with the issue of environmental healing, the Team members did not offer an opinion on this issue. The Team has, however, given both of these issues serious consideration in developing our program and activity recommendations, and both were addressed by the Team member who conducted the briefing of USAID staff and BSP partners immediately after the mission.

IV Program and Activity Recommendations/Vietnam

The recommended Programs are based on a review of written materials made available to the Team prior to its Vietnam visit and materials obtained during the field trip itself. These recommendations are also derived from the results of the many interviews conducted in Washington, D.C., Vietnam, and elsewhere, interviews with individuals and organizations with a broad understanding of Vietnam specifically and of the region generally. Finally, the Program recommendations are consistent with the selection criteria enumerated earlier in this text. Accordingly the Team has a high degree of confidence that these recommendations are well-founded and believe they would likely be confirmed by any Follow-on Mission. While the Team did consider other program areas such as industrial pollution prevention, water pollution in urban settings, agricultural pollution from herbicides and pesticides, and oil pollution and oil spill control activities, our final selections were those which we felt were most demonstrably connected to the selection criteria.

The recommended Activities are also consistent with the written material reviewed, interviews undertaken, selection criteria developed, and field trips taken. Unlike the Program recommendations, however, the Activity Recommendations are not intended to be definitive, nor does the Team suggest that these particular Activities are the only ones that could be undertaken. Indeed, later in this report we recommend several other potential activity sites for the Follow-up Mission to consider. Having said this, we do believe that our Activity Recommendations are consistent with the Program Recommendations, the selection criteria, and, if undertaken, would prove to be a benefit to Vietnam and a credit to the biodiversity support program of USAID and its partners.

The Programs we recommend include:

I. Expansion and strengthening of terrestrial protected areas management.

While there is significant donor support for improving the natural resources management in Vietnam, there are few activities that link resource management strategies with resource conservation strategies. The activities identified under this program heading combine training and capacity building efforts with practical applications in integrated conservation and development. The recommended activities also contribute to building multi-national linkages within the region to support the management of trans-boundary conservation efforts.

II. Development of a marine protected area system.

There is, as yet, little donor support for the conservation of marine biodiversity in Vietnam. Nor is there a clear institutional context for managing marine conservation activities within the Government. The activities identified under this program heading seek to combine existing capacity to create a government institution responsible for the protection and conservation of marine biodiversity. An additional benefit of this program would be the adoption of measures that could lead to the establishment of replenishment zones for key commercial fish stocks that are being seriously over-exploited.

Following the description of each recommended program, the section identifies one or more specific Activities related to that program and, using a matrix format, justifies the recommendation of the Activity against the selection criteria presented in Section IV. Under the program heading I, Terrestrial Protected Areas, the Team has recommended three Activities:

- ***Strengthening the curriculum of the Xuan Mai Forestry College*** — an Activity with potential national impact, the focus of the activity is to upgrade the skills of current and future Forest Department personnel responsible for protected area management in forest and wildlife ecology, protected area management, and community-based resource management.
- ***Integrating conservation and development in the Western Quang Nam Nature Reserve*** — an Activity with high biodiversity conservation potential, the Activity focuses on securing and maintaining the protection of one of Vietnam's largest remaining reserves of primary forest.
- ***Upgrading the status of the Can Gio protected wetlands*** — an Activity that indirectly includes the issue of "environmental healing" through the protection of a mangrove forest decimated by Agent Orange but already replanted by the Government. This Activity would result in upgrading the wetlands from that of a watershed management protected area to a potential Man and Biosphere Reserve site which, if undertaken, would be Vietnam's first such site.

Under the Program heading of Marine Protected Areas, the Team recommends a single Activity:

- ***Assistance in the creation of a of a Marine Protected Area Program for Nha Trang and/or other areas with similar biodiversity and other values*** — an activity that fills a vacuum in national marine resource conservation, and one that has important consequences for the economic and nutritional requirements of the country.

Expanding and Strengthening the Management of Terrestrial Protected Areas

Within this program area, the Team recommends activities that build institutional capacity for biodiversity conservation at the national-level, and that expand protected areas in two distinct ecosystems — tropical forests and coastal mangroves/wetlands areas.

Strengthening the Curriculum of the Xuan Mai Forestry College

As indicated in Section II, Vietnam possesses strong technical capacity to support biodiversity conservation in its scientific research institutes and its universities. It was also evident to the Mission Team that many of the provincial line departments of MARD possess staff with technical and organizational skills adaptable to effective protected area management and natural resources conservation. The objective of this proposed activity is to institutionalize the biodiversity conservation capacity building program initiated by the GEF within the Government's principal technical training facilities for foresters and park rangers.

The objective of the GEF program is to prepare the Government of Vietnam for implementation of national and provincial programs to protect areas of high biodiversity through an integrated human resources development and planning process. This implementation includes capacity building within the forestry and nature conservation sectors focusing on applied field training for grassroots level staff and formal training programs for provincial and central level managers. The project lays the groundwork for long-term, productive conservation efforts, and implementation of specific biodiversity activities outlined in the BAP through training programs designed for provincial officials, community leaders, protected area managers, forest protection officers, technicians and central government staff in applied conservation methods and techniques.

The large majority of government officials working in Vietnam's forestry and protected area management sectors have graduated from one of three traditional forestry training institutions: the Xuan Mai Forestry College near Hanoi, which, with approximately 1,200 students from Vietnam and Laos, is the largest institution; the Agriculture and Forestry College at Hue University; and the Thu Doc Agriculture and Forestry College in Ho Chi Minh City. These institutions generally follow a traditional forestry curriculum with no reference to developments in community-based resource management, sustainable forest management, wildlife protection and biodiversity conservation that have gained popularity in other Asian countries. Once graduated and employed by the various forestry sector agencies, forestry officials are encouraged to attend in-service training courses at the Dong Anh Refresher Training Center near Hanoi.

In an effort to upgrade the curriculum of the Xuan Mai Forestry College and to prepare students for work in resource conservation, the Vietnam GEF Project has begun to support curriculum development in collaboration with the College of Natural Resources at Colorado State University. This arrangement allows for an exchange of faculty between Xuan Mai and CSU, and could lead in the long-term to a "sister school" relationship between the two colleges. At present, two junior faculty from Xuan Mai are enrolled in the MS degree program at CSU in forestry. In addition to this GEF initiative, the Swiss Government supports curriculum development at Xuan Mai that focuses on improving extension techniques of foresters. These techniques include approaches that encourage greater local community participation in the management of land and forest resources.

Despite these two important developments, there remains the need for a more general strengthening of the forestry curriculum at Xuan Mai, and the other forestry colleges in Vietnam, to address the imperative needs of balancing natural resources management and biodiversity conservation. This strengthening would address the need, as highlighted in the Vietnam BAP, to manage broader biodiversity landscapes that incorporate a mosaic of small protected areas, buffer zones, corridors, plantations and agricultural lands. The improvement of project management, data collection and analysis skills (e.g., participatory rural appraisal) and extension/community outreach skills for a broader segment of the decision-making and government administrative staff would lead to better conservation and environmental program management in general. This training could, and should, be tied to the implementation of specific conservation activities, such as the protected area management initiatives proposed elsewhere in this section. The same training can be adapted for upgrading the skills of mid- and senior-level government forest officials through refresher courses at the Dong Anh Training Center.

The following table summarizes the applicability of this proposed activity to the eight selection criteria described in the previous section of this report.

Table 4.1 – Strengthening the Curriculum of Xuan Mai Forestry College

Promises High Biodiversity Conservation or Environmental Protection Value	Vietnam's three forestry colleges, and the Xuan Mai Forestry College in particular, are the primary training ground for officials working directly with forestry and protected area management in Vietnam. Programs designed to improve the teaching and expanding the courses at these academic institutions would directly benefit conservation activities in Vietnam.
Promotes Sustainable Livelihoods	The improvement of forest officials' sensitivity to the needs of forest-dependent communities would lead to more collaborative and sustainable approaches for forest management.
Builds Existing National and Local Capacity	Expanding and Institutionalizing existing curriculum support would ensure that a new generation of forest officials will be introduced to sustainable forest and protected area management practices that have had positive impact on resource conservation in other Asian countries.
Responds to Demonstrated Government Interest	The faculty of Xuan Mai are MARD staff. The Dong Anh Refresher Training Center is also the responsibility of MARD. Both the faculty of Xuan Mai and MARD officials are keen to support the CSU-Xuan Mai exchange program funded by the GEF project, and wish to see curriculum strengthening expanded to each of the forestry training facilities.
Leverages Additional Donor Support	The GEF and Swiss projects at Xuan Mai provide a good foundation for, and complement to, any possible USAID-funded support to the forestry curriculum. Xuan Mai, Hue and Thu Duc faculty often serve as consultants on donor-funded project identification and formulation missions. They can thus be influential in creating practical linkages between projects and training curriculum. The experience of the Asia Forest Network's collaboration with FIPI to improve staff skills in participatory rapid appraisal can be adapted and expanded upon in a formal curriculum.
Utilizes Established USAID Programming Vehicles and Partners	The WWF program in Vietnam is the implementing agency for the GEF project, and WWF negotiated the arrangement with Colorado State University. Other US academic and research institutions, such as the Smithsonian (which has already worked as a partner with the Vietnam GEF Project) and the East-West Center (which supports research in upland agriculture and resource management in Vietnam) are possible collaborators. Yale University, which implemented a similar program of forest curriculum reform in Nepal with USAID support, collaborates with Xuan Mai. USAID's Global Forest Resources Management activity supports a wide variety of capacity-building initiatives that can be applied, such as the Asia Forest Network.
Addresses Conservation Gaps of Regional Importance	The regular admission of Lao students to the Xuan Mai Forestry College creates a good opportunity for promoting and linking forest management and conservation efforts between Vietnam and Laos, e.g., in trans-boundary protected areas management.
Promises High Viability	Xuan Mai Forestry College is close to Hanoi. It is the principal training facility for forest officials in Vietnam, and many senior government officials have graduated from Xuan Mai, including several Provincial People's Committee chairmen. The proposed activity provides geographic balance through support to the forestry faculties in Hanoi, Hue and Ho Chi Minh City, and provides and trains specialists who will work in all provinces of the country.

Integrating Conservation and Development in the Western Quang Nam Nature Reserve

In early 1997, a team of scientists from the central and provincial forest departments and WWF undertook a survey of a 400,000 hectare area of Quang Nam Province in Central Vietnam as part of the UNDP-supported Trans-boundary Conservation Project. This area has been recently declared a nature reserve by the Government. The survey included three districts (Hien, Giang and Phuoc Son) encompassing an area stretching from a point 80 km due west of Danang city to the Lao P.D.R. border. The terrain of the survey area is mountainous and rugged, with deeply divided, steep slopes. The habitat is primarily wet evergreen broadleaf forest dominated by both tropical and sub-tropical evergreen species.

Preliminary estimates indicate that approximately 272,000 hectares (57 percent) of the survey area is forested. Shrubs and grasslands account for 128,000 hectares of the non-forested area. Forests close to areas of human habitation had been cleared for agriculture and settlement or selectively logged. Six state forest enterprises are currently active in the three districts of the survey area, but they are situated outside of the survey area itself. The timber extraction plan for each enterprise is about 2000 - 2500 m³/ per year.

The human population of the survey area is approximately 64,000 people. Most of the this population is concentrated in the northeast and southeast of the area, with very few people in the western part, along the Vietnam-Laos border. Although the average population density of Quang Nam Province — 14 persons per km² — is among the lowest in Vietnam, the province's population growth rate of 3 percent is among the highest in the country (average for Vietnam is 2.1%). Minority ethnic groups (CaTu, Ta Rieng, Ve and MoNong) comprises 72 percent of the total population of the survey area. In general, the living standard is low, with an annual per capita income equivalent to \$US 60. Shifting cultivation is the main agriculture practice in the region. Rice yields are low, averaging 1 ton/ ha and many households face food shortages for 3-4 months of the year, and thus have to forage for forest products and resort to subsistence hunting for supplemental food. Although much of the hunting is for subsistence, several endangered species, such as saola, felids, primates, bear, hornbills, and pheasants, are also hunted. Recently, gold mining and rattan collection have also become prevalent.

The reserve's forests, especially those along the border with Laos, are known to harbor tigers, bears, and other smaller carnivores. These forests should be included in the proposed protected area because of the potential to create links with intact forests across the border in Laos and establish a larger core protected area, especially for the large carnivores in the area.

Although the threats to the protected area are low at present, there is likely to be significant migration into the province from more densely populated areas of the country, especially with the upgrading of the province's road network. Thus, it is imperative that the intact forests, especially the lowland broadleaf forests, are secured within a protected area and adequately buffered.

Because of its relatively undisturbed state, the Western Quang Nam Nature Reserve represents a unique opportunity for the development of biodiversity conservation and protected area management in Vietnam as the following Table 4.2 indicates.

Table 4.2 — Integrating Conservation and Development in the Western Quang Nam Nature Reserve

Promises High Biodiversity Conservation or Environmental Protection Value	By creating this addition to Vietnam's protected area system, the Government indicated that the protection of forests of western Quang Nam Province was a high priority. The unique mix of pristine forests in this rugged mountainous area, with a relatively small population of ethnic groups who still live in relative isolation, provides one of the last remaining for significant forest and fauna conservation value in Vietnam.
Promotes Sustainable Livelihoods	With a clearly defined and sparsely populated core area, the Quang Nam Reserve provides a unique opportunity for the Forest Protection Department to establish a clearly defined buffer zone and promote integrated conservation and development activities for the minority populations inhabiting that zone.
Builds Existing National and Local Capacity	Quang Nam Province was declared a new province at the start of 1997. District-level institutions such as the District People's Committee and the District Forest Protection Department remain in place, but the provincial equivalent of these agencies needs to be established to manage the new provincial administration. Capacity building is a critical need for Quang Nam Province, and entering early in the process will provide an excellent opportunity to guide the process in a constructive manner.
Responds to Demonstrated Government Interest	The Provincial Government has indicated strong support for conservation efforts that provide economic benefits to local people. Newly appointed provincial officials are eager to show success in their protected area management efforts.
Leverages Additional Donor Support	The conservation potential in Quang Nam remains high, with species-specific interest being pursued by the U.S. Fish and Wildlife Service for tiger conservation, and by Fauna and Flora International for elephant conservation. The presence of these two charismatic species will continue to draw conservation attention and international funding. The field surveys that discovered the Truong Son muntjac were co-financed by UNDP and WWF. Both organizations have an interest in continuing work in the province.
Utilizes Established USAID Programming Vehicles and Partners	Through its survey work, WWF has developed strong working relationships with provincial and district agencies. USAID's Biodiversity Support Program has extensive experience in the design, implementation and support of conservation and development initiatives.
Addresses Conservation Issues of Regional Importance	The forests of western Quang Nam form a trans-boundary contiguous ecosystem with the Xe Sap National Biodiversity Conservation Area in Xekong Province in Laos. Taken together, the forests of these two areas, including potential corridors, cover more than 300,000 ha. Although little is known at present about the forests of Xe Sap, a survey is being planned by the World Bank Forest Management and Conservation Project in Laos with a WWF field team in early 1998. At present, there is no larger trans-boundary area in the lower Mekong region which remains ungazetted and unprotected.
Promises High Visibility	The forested areas of Quang Nam Province are some of the most extensive and most undisturbed in Vietnam, particularly those along the rugged Truong Son mountain range, which forms the border with Laos. The recent discovery in Quang Nam of a new mammal species, dubbed the Truong Son muntjac (a small barking deer) has put the province in the biodiversity spotlight.

Upgrading the Status of Can Gio Protected Wetlands

The Can Gio Nature Reserve (See Map IV) is an eighty thousand hectare mangrove and wetland ecosystem located in the coastal area southeast of Ho Chi Minh City (HCM City). The area is formed by the estuaries of the Nha Be, Gong Tranh, Nga Bay and Ca Mep rivers, tributaries of the Song Sai Gon River, which flows through the heart of HCM City (see Map 4.1). The area functions as a natural filter for HCM City's sewage and wastewater. During the war, the area served as headquarters for the Viet Cong leadership in the region. From 1969 to 1974, eighty percent of the area was defoliated with an estimated 2.5 million litres of Agent Orange and approximately 1.5 million litres of agents Blue and White. Because of the area's critical importance to HCM City, the Government replanted 35,000 hectares of mangrove forest as part of a watershed management program for the city in the late 1970s.

The area's mangroves regenerated quickly, but by the mid- to late 1980s they were under threat of over-harvesting by the local populations to meet the fuelwood requirements of HCM City. In response to this pressure, the Government put an end to mangrove harvesting in 1990 and created the Management Board for Environmental Protective Forests of HCM City (MBEPF). The MBEPF is eager to improve the protection of Can Gio Nature Reserve by delineating a core area and a buffer zone for the reserve; and by developing integrated conservation and development programs for the resident populations (approximately 2,000 ethnic Kinh) to encourage more sustainable management of the reserve's natural resources. The MBEPF is also seeking assistance to rehabilitate approximately 5,000 hectares of a degraded upland area bordering the reserve in an effort to expand the reserve and restore lost habitat for aquatic and other birdlife.

Because of its ecological significance and its critical importance for pollution control, the Can Gio Nature Reserve is a strong candidate for designation as an international *Biosphere Reserve*. Biosphere Reserves are areas of terrestrial or coastal ecosystems, which are internationally recognized within UNESCO's Man and the Biosphere (MAB) Programme for demonstrating and promoting a balanced relationship between people and nature. Under the MAB programme, the designation of *Biosphere Reserve* is intended to facilitate financing from international donors to meet three basic objectives:

- **Conservation of landscapes, ecosystems, species and unique genetic resources;**
- **Economic development at a local level that is culturally, socially and ecologically sustainable; and**
- **Logistic support for research, monitoring, education and information exchange related to issues of conservation and development.**

Vietnam has no internationally recognized Biosphere Reserve. USAID support to the Government for upgrading the status of Can Gio to a Biosphere Reserve would be a strong demonstration of support for the Government in the international arena. The initiation by USAID of integrated conservation and development activities through the appropriate agencies of MARD and MBEPF in Can Gio would achieve two objectives: 1) it would promote biodiversity conservation; and 2) it would address, indirectly, the residual impact of chemical defoliants on

the area's population through rural income generation initiatives. Further justification for the consideration of this recommended activity is contained in Table 4.3.

Table 4.3 – Upgrading the Status of the Can Gio Nature Reserve

Promises High Biodiversity Conservation or Environmental Protection Value	The Can Gio Nature Reserve serves as a superb natural filter for the Son Sai Gon River which runs through the heart of HCM City into the South China Sea. The rehabilitated mangrove/wetland area contains 105 plant species and more than 150 animal species. The tentative core area for the proposed reserve contains 40 species of mangrove.
Promotes Sustainable Livelihoods	Support for integrated conservation and development activities within the area would provide resident populations with strategies for the sustainable management of the area's resources and alternative strategies for income generation.
Promises High Visibility	A US/Vietnam cooperative venture that would take an area ravaged by the war and raise it to the status of Vietnam's first internationally recognized Biosphere Reserve would have enormous environmental and political significance.
Builds Existing National and Local Capacity	No local, provincial or central government authority in Vietnam has participated in the process of establishing a Biosphere Reserve. A UNESCO team is due to arrive for discussions with the Government on this and other matters in early October. If undertaken, this initiative will create a core of Vietnamese professionals familiar with international processes for establishing and managing nature reserves in estuaries areas with high mangrove and wetland biodiversity values.
Responds to Demonstrated Government Interest	The early success in rehabilitating and managing the Can Gio reserve is the result of the cooperative efforts of the MARD, DARD, MBEPF, and the representatives of Peoples' Committee of HCM City and neighboring districts. MBEPF is actively seeking support for expanding, and improving the management of, the reserve area.
Leverages Additional Donor Support	Raising the status of Can Gio to an international Biosphere Reserve would ensure multi-donor interest in supporting MAB objectives in Vietnam. The Government of Vietnam has demonstrated its own interest in protecting the area through its initiative to restore and protect Can Gio's mangrove forests.
Utilizes Established USAID Programming Vehicles and Partners	No INGO is currently working in the Can Gio reserve but there are experienced USAID partners in Vietnam, including WWF, IUCN, CARE International, and in the region, including Wetlands International, that could support the design and implementation of integrated conservation and development activities. As noted elsewhere, USAID's Biodiversity Support Program also has extensive experience in the design, implementation and support of conservation and development initiatives.
Addresses Conservation Issues of Regional Importance	Can Gio reserve is an important habitat for the region's aquatic birdlife. The creation of a Biosphere Reserve at Can Gio would focus international attention on a number of significant nature conservation problems, and conservation vs. development issues in Indochina.

Map V Landuse Map of the Can Gio Nature Reserve

(All maps can be found in the packet inside the back cover of this report)

The Imperative for Marine Protected Areas

Marine fish and invertebrates provide half of the animal protein in Vietnamese diets. Marine resources are already Vietnam's second leading export commodity and plans are to double the export value by the year 2000. The long-term sustainable yield for marine fisheries in Vietnam is estimated to be 1.1 million tons. In 1995, landings of marine fish totaled 928,860 tons, or about 93 percent of the long-term sustainable yield. Clearly, the Government's plans to double the value of fish exports by the year 2000, coupled with projected increased domestic consumption through substantial population increases, will extend the Vietnamese marine fishery beyond sustainable levels. While the present catch appears to be below the long-term sustainable yield, the most valuable species — among them shrimp, cuttlefish, grouper, snapper, lobster and abalone — are showing signs of stock depletion. According to the Institute of Oceanography at Nha Trang, commercial extraction is becoming a serious threat to a broad range of Vietnam's commercially valuable marine fish.

No formal program for the protection of marine areas exists in Vietnam. The Ministry of Agriculture and Rural Development, the principal Government agency responsible for protected area management, has neither the technical capacity in the marine sciences, nor any formal mandate to manage off-shore natural resources. The Institute of Oceanography — the Government's leading marine research and training facility — has developed and submitted proposals for a Marine Protected Area (MPA) in Nha Trang bay to MARD but has received no response to those proposals. Nor has any donor come forward with support for the development of an MPA program. The Asian Development Bank has approved a loan package related to marine fisheries but the investment is geared to improving port facilities for fish landing and processing, which is likely to exacerbate rather than improve the current declining state of the resource.

The Mission Team sees an enormous opportunity for USAID to take the lead in support of Marine Protected Areas in Vietnam. The already declining state of marine fisheries, and the broad societal implications for this decline, creates an imperative for the cooperation of a number of central government ministries, provincial agencies, and local People's Committees in a joint effort to address this resource crisis. Through its long-running Coastal Resources Management activity, USAID has gained extensive experience in the management of marine fisheries and coral reefs in the Asia and Pacific region. A carefully designed MPA program could provide protection not only for rapidly dwindling coral reef resources in Vietnam but also for the protection of important nursery areas for prized commercial fish species. At present, there is little data on the exact location of nursery areas, many of which are likely already being destroyed by destructive fishing practices that utilize explosives and toxic chemicals, as well as by shrimp trawling.

Table 4.4 provides justification for the development of a Marine Protected Area off the shores of Nha Trang, a city in south-central Vietnam that lies 370 kilometers northeast of Ho Chi Minh City near the mouth of Cam Ranh Bay.

Table 4.4 – Development of a Marine Protected Area at Nha Trang

<p>Promises High Biodiversity Conservation or Environmental Protection Value</p>	<p>The coastal waters and off shore islands of Nha Trang support mangrove forests, seagrass beds and fringing coral reefs. The reefs of south-central Vietnam (the Nha Trang area) support the highest biodiversity of reef-building corals in Indochina (>65 genera) and are only slightly less diverse than the Indo-Pacific “centre of biodiversity” in the Philippines-Indonesia-Great Barrier Reef region (70 genera). The Nha Trang site was previously identified by the Nha Trang Institute of Oceanography and the IUCN as a promising site for the establishment of a MPA.</p>
<p>Promotes Sustainable Livelihoods</p>	<p>Because of the importance of marine fisheries to the nation’s economy and the population’s nutrition, protection and sustainable management of marine habitats is a conservation priority of enormous magnitude. Protection of marine resources sustains artisanal as well as commercial fisheries and promotes tourism development.</p>
<p>Promises High Visibility</p>	<p>Nha Trang is rapidly developing into one of the principal tourist destinations along the Vietnamese coast, thus an activity here would have significant visibility. National and International interest in a US/Vietnam collaboration on such an important and unique (i.e., “first of its kind”) effort as an MPA would be significant.</p>
<p>Builds Existing National and Local Capacity</p>	<p>Currently no national entity addresses marine conservation issues. An expressed interest on the part of USAID for an MPA program would likely result in the creation of an appropriate national entity to oversee MPA development. The Institute of Oceanography is physically located in Nha Trang and thus technical capacity is already in place. There is very strong provincial and local support for the MPA activity in Nha Trang as the area relies on the natural beauty of its marine resources to attract tourism. If carefully developed, MPA’s have the capacity to attract the support and involvement of ministries and departments such as those from finance and investment, tourism, ocean products, and agriculture and rural development.</p>
<p>Responds to Demonstrated Government Interest</p>	<p>Local and provincial officials in Nha Trang (provincial departments and People’s Committees) indicated strong support for this activity. There is also strong support at the central government level within the National Environment Agency.</p>
<p>Coverages Additional Donor Support</p>	<p>IUCN has initiated preliminary planning efforts for a Nha Trang-based MPA, as well as a possible MPA for the Islands of Con Dao further to the south of Nha Trang. Their interest continues. A GEF grant (PDF-B) for the South China Sea will lead to a full project that will likely focus in part on protection of coral reefs. Early selection of Nha Trang as an MPA site with important coral reef resources could well position it for GEF attention and resources at a later date.</p>
<p>Utilizes Established USAID Programming Vehicles and Partners</p>	<p>IUCN and WWF have actively supported the Institute of Oceanography in its efforts to develop an MPA at Nha Trang. USAID’s global Coastal Resources Management activity has considerable experience with the design, implementation and support of marine resource protection activities.</p>
<p>Addresses Conservation Issues of Regional Importance</p>	<p>The coral reefs of Vietnam are among the richest in the South China Sea. Their protection will help ensure the sustainability of marine fisheries within the region.</p>

V Program and Activity Recommendations/Indochina Region

This section presents the Team's recommendations for a regional program and activities that encompass the lower basin of the Mekong River. The activity recommendations focus on a modeling effort that would enable development planners to evaluate the impact of hydro power development (as well as other proposals for significant water withdrawals or diversions) on the hydrology of the lower basin, on the integrity of lower basin ecosystems, and on sustainable agricultural and fisheries production and food security for the region as a whole.

The Mekong River Basin Emphasis

In the Indochina regional context, particularly for Vietnam and Cambodia, the continued ecological health of the Mekong River basin is crucial for long term food security. Historical and present day Mekong River flow patterns are critical to in Vietnam's agricultural productivity (see Maps 6, 7, and 8). However, the sensitivity of this agricultural productivity to incremental variations in water flows that are human-induced (e.g., as a result of hydro power development, degradation of watersheds, or conversion of complex ecosystems for less complex use such as wetlands for agriculture or mangroves for shrimp culture) is not well understood. In Cambodia, eighty percent of the animal protein in the national diet is derived from fish consumption, the vast majority of which originates from the inland fisheries of the great Tonle Sap lake. The flows of the Tonle Sap are in delicate balance with those of the Mekong, and this delicate balance strongly suggests that the Tonle Sap and its remarkable level of productivity are extremely sensitive to variations in water levels, the timing and release of water throughout the system, and to sedimentation rates.

The issue for the Team was one of whether a program can be designed that: would have the lower Mekong River basin as its principal focus; would provide new and useful information on the relationship of upstream development on food security and ecological values; would not duplicate any other existing effort; and would attract cooperative assistance from other donors.

The MRC has been the regional forum for Mekong River basin issues for over 30 years. However, the MRC is increasingly seen by regional experts as losing what effectiveness it might have had in its early years. According to many observers, the MRC has largely ignored environmental issues in Mekong basin development, and it has failed to be sufficiently responsive to the concerns of downstream nations (e.g., Vietnam and Cambodia) to the development plans of upstream nations (e.g., Thailand and Lao P.D.R.).

Map VI — Main River Systems of Indochina

(All maps can be found in the packet inside the back cover of this report)

Map VII Land Use in the Mekong Delta

(All maps can be found in the packet inside the back cover of this report)

Map VIII Protected Areas of the Mekong Delta

(All maps can be found in the packet inside the back cover of this report)

Promoting Food Security and Ecological Integrity of the Lower Mekong Basin

We know that the agricultural and fishery producing areas of the lower basin are extremely sensitive to the availability (timing of releases through the system) and the overall quality of water. What we do not know is how the array of upstream development activities will affect the delicate hydrologic cycle of the lower basin.

Determining the likely effect of upstream Mekong development on downstream resources is difficult due to the lack of definition of what will constitute the full range of upstream activity. For example, there is no agreement on how many dams upstream countries may eventually construct, where those dams will be located, what purposes they will serve, or what range of interests their rule (operating) curves will be developed to serve. Until the effects of some *particular* set of proposals can be demonstrated on the most sensitive or important socio-economic downstream values, we are left with having to do one-at-a-time effects assessments of single proposals. Not only is this a time consuming and resource intensive process, it fails to capture the cumulative and synergistic effects that multiple developments will cause in sensitive downstream areas.

The Asian Development Bank is currently undertaking an impact assessment of six selected hydro-development proposals for the Mekong River basin. An attractive activity option for USAID would be to take those same six proposals and model downstream effects of their combined influence on the resources of the Mekong delta. This activity would require careful attention to identifying the necessary data and information to supply the model, ascertaining its availability, and determining resource requirements to obtain data critical to the model but not yet available. It is in this latter activity that it is important to involve the MRC, because it is the source for important data information that would be needed for the effort. This is particularly true for Cambodian data.

While it is important that the MRC be substantially involved in this initiative, it should not be the dominant entity. There are those that question whether the MRC has the capacity to be the impartial institution necessary to define and speak to the legitimate interests of the downstream nations. Most important is the *perception*, particularly, although not exclusively, among the international NGO community, that the MRC is too politicized to credibly develop the interactive model that is the crucial first step to defining and defending the important food and biodiversity interests in the lower part of the basin.

Without a doubt, the Team's recommendation for a regional program is a complex one. USAID will need to invest considerable time and resources to formulate an effective program design. Table 5.1 provides some justification for this investment and identifies a number of potential activities that could be encompassed by the program.

Table 5.1 - Promoting Food Security and Ecological Integrity in the Lower Mekong Basin

<p>Promises High Biodiversity Conservation or Environmental Protection Value</p>	<p>The remaining areas of biodiversity value in the lower Mekong River basin delta are of global significance. The Tram Chim Nature Reserve in Vietnam's Mekong Delta, for example, is the most important nesting area of the endangered E. Saurus Crane. The Tonle Sap is crucial to the Mekong fisheries and hydrology, not only for Cambodia but for Vietnam and, to a lesser extent, Laos. Effective modeling of basin development will contribute to improved conservation and management of these resources.</p>
<p>Promotes Sustainable Livelihoods</p>	<p>Hydro power development in the Mekong basin may have considerable negative impact on the livelihoods of artisanal fishing populations and lowland rice farmers. Effective modeling of development impacts will enable downstream governments to gauge the extent of those impacts and respond accordingly.</p>
<p>Promises High Visibility</p>	<p>Vietnam's Tram Chim Nature Reserve has international visibility. The Tonle Sap and its associated resources also have global visibility. The Mekong River basin as a whole has tremendous visibility as it is the last "untamed" river in the world, and has been the focus of extensive press attention over the last forty-five years of war in the region.</p>
<p>Builds Existing National and Local Capacity</p>	<p>Aside from the MRC, there are dozens of NGO's, governments, foundations and others that have directly participated in, or in some way been connected to, work on the Mekong. The modeling initiative envisioned here has not been done by anyone and would constitute a valuable addition to the environmental and food security issues of the lower basin that need to be a greater focus in continuing discussions about future Mekong River basin development activities.</p>
<p>Responds to Demonstrated Government Interest</p>	<p>The Government of Vietnam takes food security very seriously. The importance of rice exports as Vietnam's largest earner of hard currency makes the security of the delta crucial to the national economy. The concerns of Cambodia about the Tonle Sap in relation to Mekong development decisions have forcefully and frequently described to the authors of this paper by the current Cambodian Environment Minister and others in the Cambodian government.</p>
<p>Leverages Additional Donor Support</p>	<p>A representative of the Team had discussions with representatives of the ADB in relation to their potential support for a modeling initiative, with a specific emphasis on the resources of the Tonle Sap. There is also the possibility of private foundation support for this activity, specifically the Rockefeller Brothers Fund, which has already provided support for Mekong River related activity, may be interested in further funding. Existing donors who have already financed the collection of data that would be necessary to the construction of a successful model (e.g. GEF/WB) would also likely be interested in contributing the results of their work and perhaps building upon it.</p>
<p>Utilizes Established USAID Programming Vehicles and Channels</p>	<p>The World Resources Institute has been actively interested in developing a model along lines of what has been recommended here. The WWF has been actively involved in promoting conservation in the Tram Chim Nature Reserve. IUCN and Wetlands International have been active in wetland conservation in both Cambodia and Vietnam.</p>
<p>Addresses Conservation Issues of Regional Importance</p>	<p>The biological resources of the lower Mekong River basin are not only regionally significant but globally significant. Their protection and sustainable management is imperative to ensure the productivity of agriculture and fisheries, and the conservation of biological diversity.</p>

VI Conclusion and Recommendations for Follow-on Mission

The most significant challenges to the conservation of Vietnam's biological diversity lie in its growing population density and demand for agricultural land, and the potential threats from unregulated commercial exploitation of natural habitats through activities such as logging, illicit trade in wildlife and non-timber forest products, increased capitalization of marine and freshwater fisheries (including shrimp farming), unregulated tourism development, and the development of offshore oil reserves. The most significant challenges to the conservation of regional biodiversity include the impact of un-coordinated development of the Mekong River and its tributaries, which includes the development of water resources for hydro-power as well as the exploitation of watersheds (for timber extraction and conversion of fragile lands for agricultural purposes) throughout the lower basin.

Each of the countries in the region have a number of national and regional action plans that provide comprehensive guidance for the strengthening of government policies and institutions related to biodiversity conservation (see References). Having reviewed this guidance, the Team has attempted to identify some of the gaps in existing donor support for biodiversity conservation. At the same time, we have attempted to identify how best USAID could fill those gaps within the context of both a national- and regional-level assistance programs. The team concentrated its efforts at the national-level on Vietnam. The current suspension of USAID assistance in Cambodia discouraged us from addressing the biodiversity conservation issues in that country except from the standpoint of a regional program — particularly the protection of the great Tonle Sap lake. The difficulty of traveling to potential field sites in Laos during the assessment and within the time available to the Mission Team similarly discouraged us from addressing the biodiversity conservation issues in that country except from the standpoint of a regional program — particularly the coordinated management of transboundary protected areas and issues related to the lower Mekong River basin.

The Mission Team is cognizant of the fact that it has undertaken its assessment work in a very compressed period of time. We are also aware that a Follow-up Mission will be necessary to accomplish a number of other specific steps that should be taken prior to a final determination of the full array of Programs and Activities that USAID will undertake in Vietnam and the region. For example, the Team was not able to meet with the U.S. Ambassador to Vietnam, and we know that he has been most interested in and active on environmental issues.

The Team was also cautious in relation to meeting with high level government officials, as we did not want to inadvertently leave any impression that our visit would in any way be conclusive in relation to the selection of specific Programs and Activities. We recognize that these are likely priorities for any Follow-on Mission.

Notwithstanding the above, the Team is confident that its recommendations for potential programs and activities in Vietnam set the stage for a follow-on mission to take the discussion of programming to the next levels of the Vietnamese government, both national and provincial. It is also clear that there is commitment and capacity among the Vietnamese to meet this challenge, and that there are effective partners (INGOs) with whom USAID can work to support Vietnam's efforts.

For the strengthening of the forestry curriculum, the next level of discussion would be with the Director of the Xuan Mai Forestry College and relevant officials in MARD. For the

integration of conservation and development in the Western Quang Nam Nature Reserve, the next level of discussion would be the officials of DARD, the provincial and relevant district People's Committee, and officials in MARD, particularly representatives of both the Forest Protection Department and the Forest Development Department since there are competing interests for forest conservation and forest exploitation in and around the reserve. For the upgrading of Can Gio Nature Reserve to an international Biosphere Reserve, the next level of discussion would be with the People's Committee of Ho Chi Minh City, officials of the MBEPF, DARD, DFPD and, at the central level, MARD and MOSTE. For the development of a Marine Protected Area at Nha Trang, the next level of discussion would be with officials of the Institute of Oceanography, the provincial DARD and People's Committee, and MARD.

The recommendations for a lower Mekong River basin initiative will require far more complex follow-up to secure an appropriate level of inter-governmental cooperation. Discussion should begin with MARD officials in Hanoi and Ministry of Environment officials in Phnom Penh.

As mentioned earlier in this report, there may well be other Activity sites that could prove to be as useful, or more useful, to the Program needs that have been described. Specifically, we would recommend that the Follow-on Mission undertake a visit to the islands associated with Con Dao National Marine Park, consider a further activity for the Vietnam portion of the Mekong Delta, visit the largely still intact forests in Ha Tinh Province, and consider the possibility of initiating a terrestrial biodiversity protection activity that would create linkage to an ethnic minority.

Con Dao is located at the southern reaches of Vietnam and lies approximately 100 kilometres off the Mekong Delta. It has high marine biodiversity values, a very able Park Director, provides nesting habitat for two species of endangered sea turtles (Green and Hawkbill), and provides habitat for Dugong. It is sparsely populated, and thus population pressure, so prevalent as an issue in most other areas of Vietnam, does not pose a problem here. There is, however, oil production and on-going oil exploration in the immediate vicinity of Con Dao. This can be seen as both a constraint and an opportunity. One could argue that it is only a question of time before a catastrophic oil spill would wipe out the substantial biodiversity of the area and simultaneously destroy any opportunity for the development of eco-tourism in the area. On the other hand the presence of oil interests could be seen as an opportunity to involve oil companies and the government in a cooperative effort to define and adopt best practices and develop contingency plans that could mitigate damage to sensitive areas in the event of a spill.

The Team was not able to visit Con Dao due to airport repairs underway on the main island. The repairs are due to be completed late this year, however, and thus a Follow-on Mission will likely be able to access this promising site.

Ha Tinh Province is located in the North Central region of Vietnam. The forests in Ha Tinh are said to have rich biodiversity, low population density, the absence of ethnic minorities, and are contiguous across the Laotian border. There is no major donor addressing forestry issues in Ha Tinh Province at this time. An added advantage to this possible Activity area is that it is the home province of a number of high ranking government officials and this would likely facilitate the cooperation of the government in any initiative. The Team did not visit this site as we did not learn of its existence until after our itinerary had been set and all travel

logistics arranged. Information regarding this area comes from Terry Rambo of the East West Center, one of the most respected rural development and forestry professionals working in Vietnam.

The increasing use of herbicides and pesticides in the Mekong Delta is a concern, and could benefit from the support of an Activity centered on integrated pest management (IPM). The concern is that increasing reliance on herbicides and pesticides will lead to greater numbers and species of resistant pests and cause ecosystem health damage including damage to human health. WWF/US has substantial experience in the area of IPM. The Team did not consider this Activity while in the field, but it is mentioned here in response by a question about the extent to which, if at all, Vietnam has employed IPM as a strategy to try to reduce pesticide use in the Delta. The answer to this question is worth pursuing.

The Follow-on Mission could also consider the possibility of initiating a terrestrial biodiversity protection activity in collaboration with an ethnic minority. WWF has initiated a successful collaboration with the Karen tribe in Thailand that could serve as the model for such an effort. The WWF, as one of its activities within the BSP, has worked with the Karen to, among other things, produce 3-d maps of six Karen village clusters, undertake wildlife, insect and plant surveys, document traditional Karen forest management

Map IX – Con Dao Island Archipelago

(All maps can be found in the packet inside the back cover of this report)

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ANNEXES

Annex A Mission Terms of Reference

The Biodiversity Support Program will provide technical assistance to the Asia and Near East Bureau of USAID by fielding a team to review biodiversity conservation efforts and identify options for potential USAID engagement, through NGOs, in biodiversity conservation in terrestrial, aquatic and marine areas of Vietnam and, in a regional context, Cambodia and Laos. The review team is comprised of one terrestrial and one aquatic resource management specialist who will carry out the specific activities described as follows.

1) Prepare an overview of the biodiversity conservation priorities currently identified in Vietnam and, in a regional context, Laos and Cambodia as well.

This overview will encompass all major ecosystems including coastal, marine, wetland, riverain, lacustrine, forest and grassland. The overview will include information on whether the sites that have been prioritized include residents and whether these residents are Indigenous Peoples who have asserted claims to the area.

To develop this overview, the Consultants will draw on secondary data sources such as national environmental action plans, relevant national analyses or strategies, tropical forestry action plans and biodiversity action plans, and donor investment strategies to the extent that these sources exist for each country. The Consultants will also interview national and international specialists familiar with biodiversity conservation policy and practice in the region.

This overview of current biodiversity conservation priorities will provide the Consultants background information that can be used to identify gaps as the Review activity proceeds. This is crucial as certain of the exiting priorities may no longer be relevant due to the dynamic nature of socio-economic and political changes in the region. The Consultants will also be able to compare the biodiversity conservation priorities according to criteria established in the Agency's global *Biodiversity Conservation Strategy* (in draft). This ranking will enable the Consultants to identify and initial grouping of potential programming interventions that would meet USAID's overall objectives for biodiversity conservation at the country- and regional level.

2) Prepare a synopsis of planned and current donor-supported biodiversity conservation activities in each of the three countries, and for the region as a whole.

Regional activities should be disaggregated to identify activities specific to each country. This synopsis will identify the location, scope, funding level, implementing agency(ies) and duration of each initiative.

Completion of this task will require interviews with multilateral and bilateral donor representatives and implementing agencies in Vietnam and Laos, and, to the extent feasible, in their headquarters. The Review Team will be authorized to visit the appropriate offices of the World Bank, the Global Environment Facility, USAID, WWF and other relevant organizations in Washington, D.C., and the appropriate offices of the Asian Development Bank in Manila.

The Consultants will utilize this synopsis to identify programming gaps in current donor activities, and to identify necessary and appropriate USAID-funded interventions. The synopsis will be included in the Review report as an annex.

3) Identify, and assess the capacity of, partner organizations that can support the implementation of USAID-funded biodiversity conservation activities in each of the three countries.

The Consultants will interview the appropriate representatives of public and private agencies responsible for the management of natural resources, tourism, the protection of wildlife, the formulation of nature conservation policy and the implementation of natural resource conservation activities (e.g., government capacity building, community-based resource management, parks and protected area management, and eco-tourism). Interviewees will include government officials, representatives of parastatal organizations, representatives of international and national NGOs, and private contractors that are implementing activities related to nature conservation. The Team will assess the capacity of these organizations to support potential USAID-funded biodiversity conservation activities with technical and human resources adequate to achieve the objectives of those activities. To the extent that time, logistics and funding permit, the Team will visit selected ongoing biodiversity conservation activities in the field to assess the implementor's capacity first-hand.

The Consultants will prepare an inventory of all organizations relevant to potential biodiversity conservation programming in each of the countries in the region, as well as the region as a whole. The inventory should include all current contact information for the representatives of each organization, a brief description of the activities the organization, and a brief assessment of the organization's capacity as a potential implementing partner. The inventory will be included in the Assessment report as an annex.

4) Prepare a Report that incorporates the findings of tasks 1-3 above and provides biodiversity conservation programming recommendations through FY 2004.

The Consultants will prepare a report of no more than twenty-five pages, including maps and tables, that identifies clear programming options for USAID in Vietnam and the neighboring countries of Indochina that are consistent with the Agency's overall objectives in biodiversity conservation. The report will highlight programming opportunities for USAID that are complimentary with other donor initiatives so as to develop the potential for leveraging technical and financial resources to maximize the Agency's investment at the country- and regional-level. The report will also identify appropriate and capable organizations that can serve as effective conservation partners. The report will include a consideration of options for working with indigenous Peoples (ethnic minorities) and/or other residents in areas to be targeted for conservation.

The report will identify one or more objectives that can be achieved within a five-year programming time frame, as well as recommendations for more immediate follow-up activities to compliment and/or complete work done by the Consultants.

Annex B Vietnam Biodiversity Overview

Criteria for Protection of Biodiversity	Remarks
Species Richness in the Area	<p>277 species of mammal (including 3 newly described in 1993, 1994 and 1997)</p> <p>773 species of birds</p> <p>130 species of reptiles</p> <p>80 species of amphibians</p> <p>7,000 plant species scientifically described (est. 12,000 total)</p>
Species Endemism in the Area	<p>Vietnam's flora has a high level of local botanic distinctiveness with endemic species centered in four areas: Hoang Lien Son mountains in the NW, the Ngoc Linh mountains, the Lang Vien highlands, and the evergreen forests of central Vietnam. Like the plants, faunal groups also show a high degree of local distinctiveness with many endemic forms, such as <i>Trachypithecus francoisi</i>, which has 5 sub-species, 4 resident only in Vietnam.</p> <p>Many endemic species in Vietnam are confined to small geographical ranges and occur at low densities, rendering them highly susceptible to extinction.</p>
Ecologically Diverse Area	<p>The country stretches from 8°N to 24°N with a total coastline of 3,200 km and a land area of 329,566 km² which is 75% mountainous. Because of this wide range of latitude and altitude, there are broad climatic differences which create numerous micro-climates.</p> <p>It is significant to note that Vietnam contains two of the world's major river deltas, the Mekong and Red, which together provide extensive wetlands habitats.</p>
Contains important gene pools and relatives of economically important species	<p>A recorded 5,000 plant species in Vietnam are used for food, medicines, animal fodder, wood and other economically valuable purposes.</p> <p>Animal species, such as the endemic and severely endangered kouprey forest cow (<i>Bos sauveli</i>) and the newly described mammals, both which appear to be remnant populations of primitive species, can provide important genetic material for domesticated animals and for evolutionary research.</p>
Provides examples of sustainable management of biodiversity	<p>Vietnam's current transformation from a planned to a market economy provides an opportunity to introduce new models for conservation and sustainable resource use at an early stage in the country's development process. Dramatic changes are happening in the economic, legal and institutional arrangements for the agricultural, rural and forestry sectors.</p>
Area considered "hot spot" (i.e. threatened by destruction,	<p>Remote sensing data indicate that only two million hectares of natural primary forests remain in Vietnam. These are being</p>

Criteria for Protection of Biodiversity	Remarks
degradation or conversion)	reduced at the rate of 100,000 to 200,000 hectares annually.
Destruction of one ecosystem is likely to affect the biodiversity of another	The majority of Vietnam's 74 million population live on lowland river deltas which are severely affected by flooding as highland watersheds are destroyed. Erosion of the coastal areas reduces the fertility of fisheries which are a major source of protein in the Vietnamese diet.
Area contains habitats frequented by migratory species	Vietnam's east coast is on the major Asian flyway of migratory birds from the Siberian mainland to Australia and the lower Pacific region.
Species and ecosystems that fall under international treaties, laws, agreements and conventions including Ramsar, CITES, and World Heritage	<p>Vietnam is a member of Ramsar and currently manages the only Ramsar site in Southeast Asia.</p> <p>Vietnam joined CITES in 1994, with membership officially recognised in April 1994. There are at present 365 endangered animal species resident or endemic to Vietnam. Significantly, Vietnam's first official act as a signatory of CITES is to introduce the Appendix I listing of the saola and the Giant muntjac.</p> <p>Ha Long Bay was accepted as a UNESCO World Heritage Site in 1994.</p>
Cultural Importance of Area, or Species of Cultural Importance	The forests and/or wetlands and coastal areas in Vietnam's protected area system include places of cultural and historic significance. The Vietnamese heritage is closely linked to the natural resources of the nation.

Source: WWF/Indochina Programme

Annex C Individuals Contacted

Ba Kan Province

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Prof. Vo Van Lanh, Director/Institute of Oceanography, Nha Trang (Tel: 058-881151)

Quang Nam Province

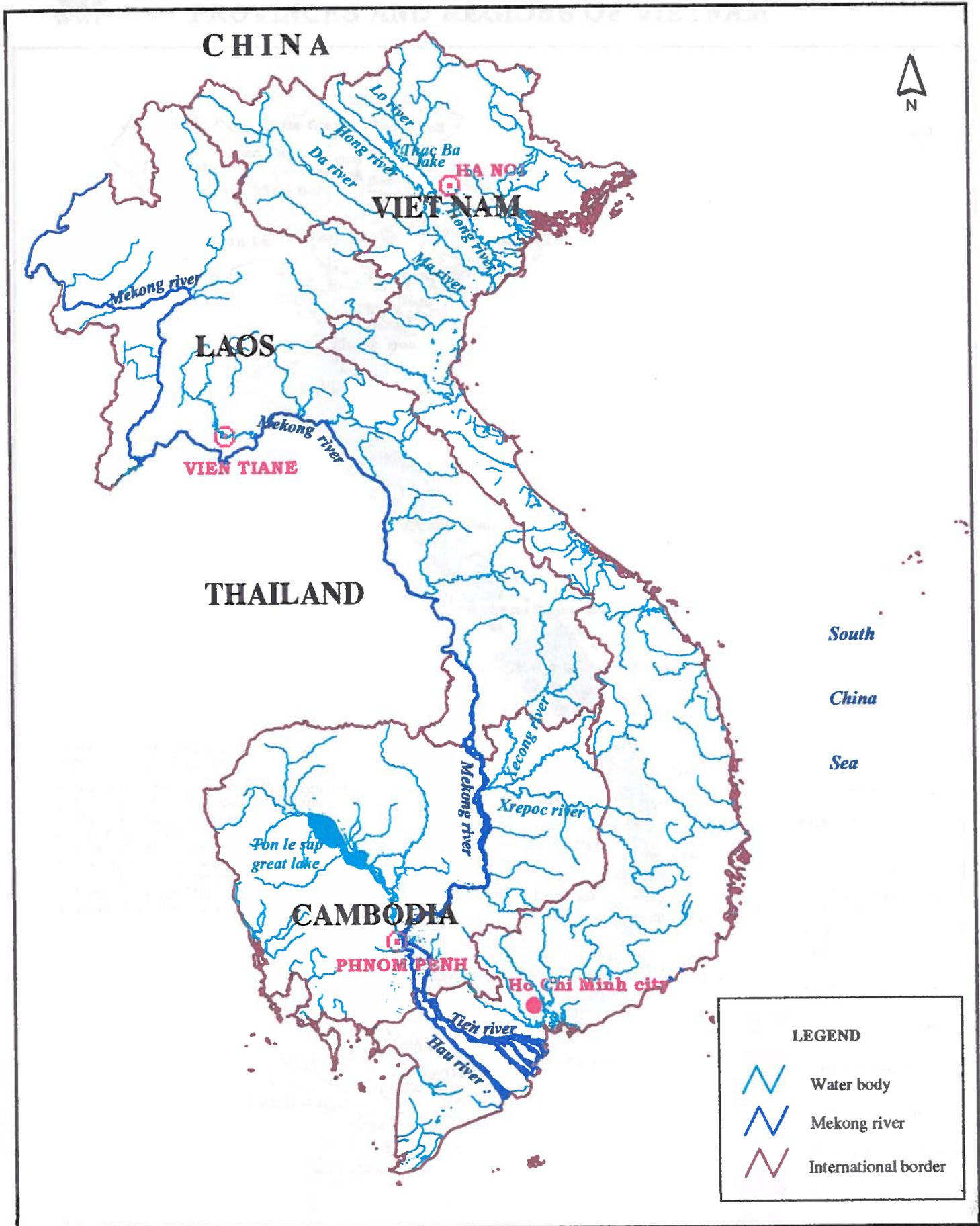
Ho Yan Son, Provincial Forest Protection Department of Quang Nam, Tam Ky (Tel: 0510-852551)

Le Tri Tap, Chairman/People's Committee of Quang Nam Province, Tam Ky (Tel: 0510-852732)

Phan Van Chuc, Vice Director/Department of Science, Technology and Environment of Quang Nam Province, Tam Ky (Tel: 0510-852653)



RIVER SYSTEMS IN INDOCHINA





PROVINCES AND REGIONS OF VIETNAM



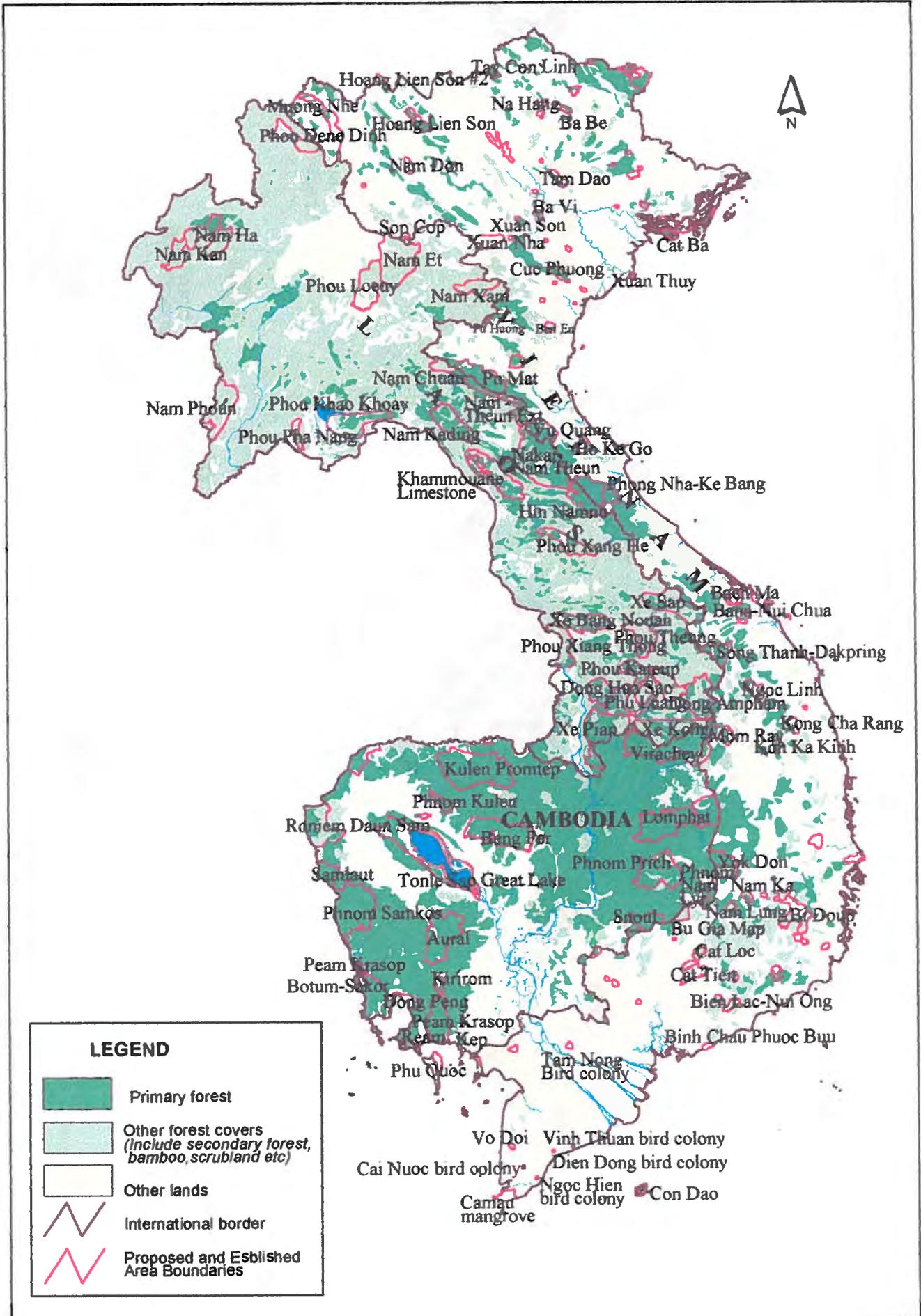
Note: The following are provinces recently divided into two:

1. Bac Thai: Bac Can and Thai Nguyen
2. Vinh phu: Phu Tho and Vinh Phuc
3. Ha Bac: Bac Giang and Bac Ninh
4. Hai Hung: Hai Duong and Hung Yen
5. Nam Ha: Ha Nam and Nam Dinh
6. Quang Nam-Da Nang: Quang Nam and Da Nang city
7. Song Be: Binh Duong and Binh Phuoc
8. Minh Hai: Bac Lieu and Ca Mau

LEGEND

-  Provincial border
-  Northern Mountain and Midland
-  Red river Delta
-  North Central Coast
-  South Central Coast
-  Central Highland
-  Northeastern South
-  Mekong River Delta
-  Hanoi city
-  Ho Chi Minh city

PROPOSED AND ESTABLISHED NATURE RESERVES AND NATIONAL PARKS IN CAMBODIA, LAOS AND VIETNAM

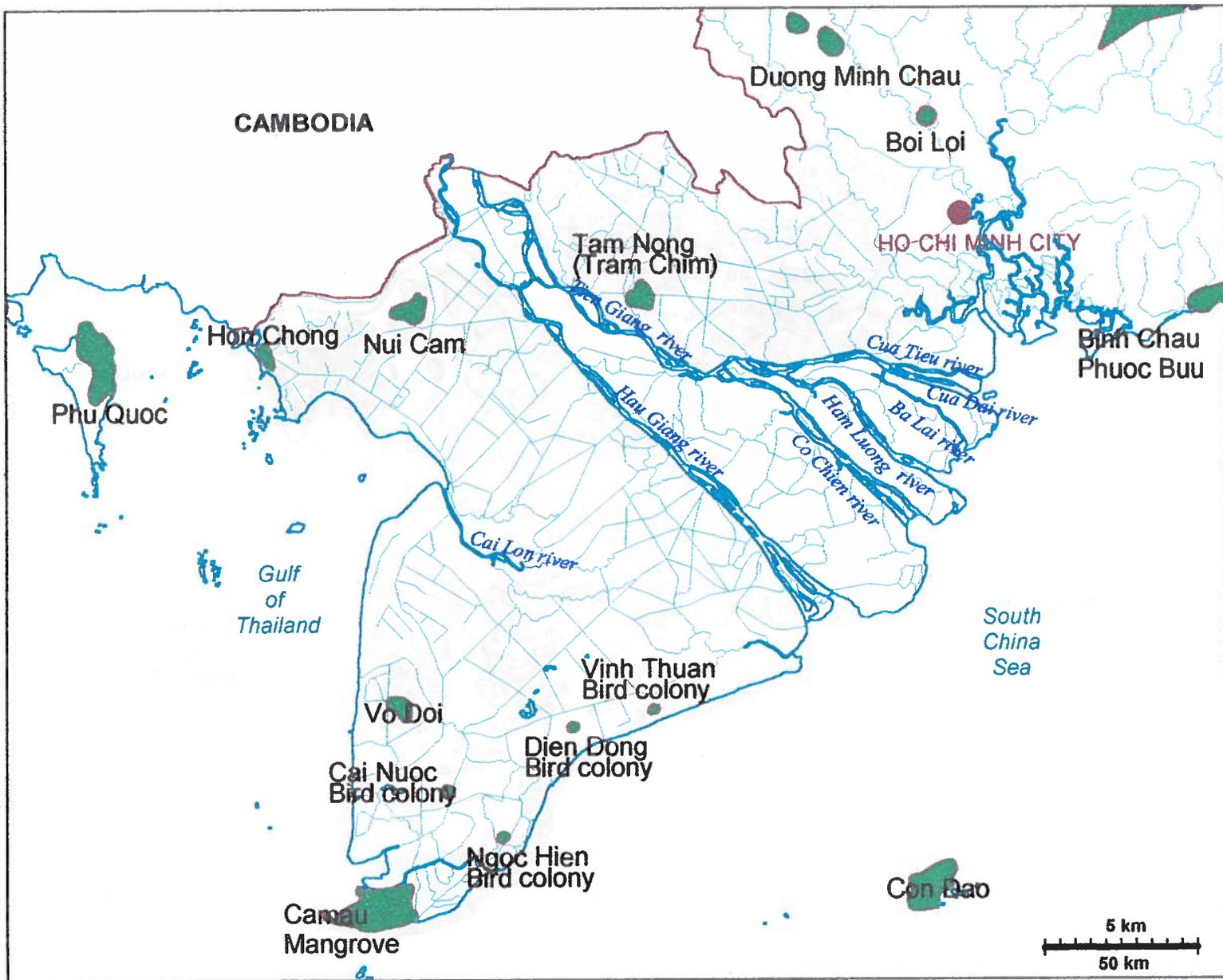


PROTECTED AREAS OF THE MEKONG DELTA



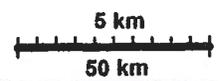
103°45'

11°25'



LEGEND

-  Protected area
-  Water body
-  Canals and Small rivers
-  International border



8°25'

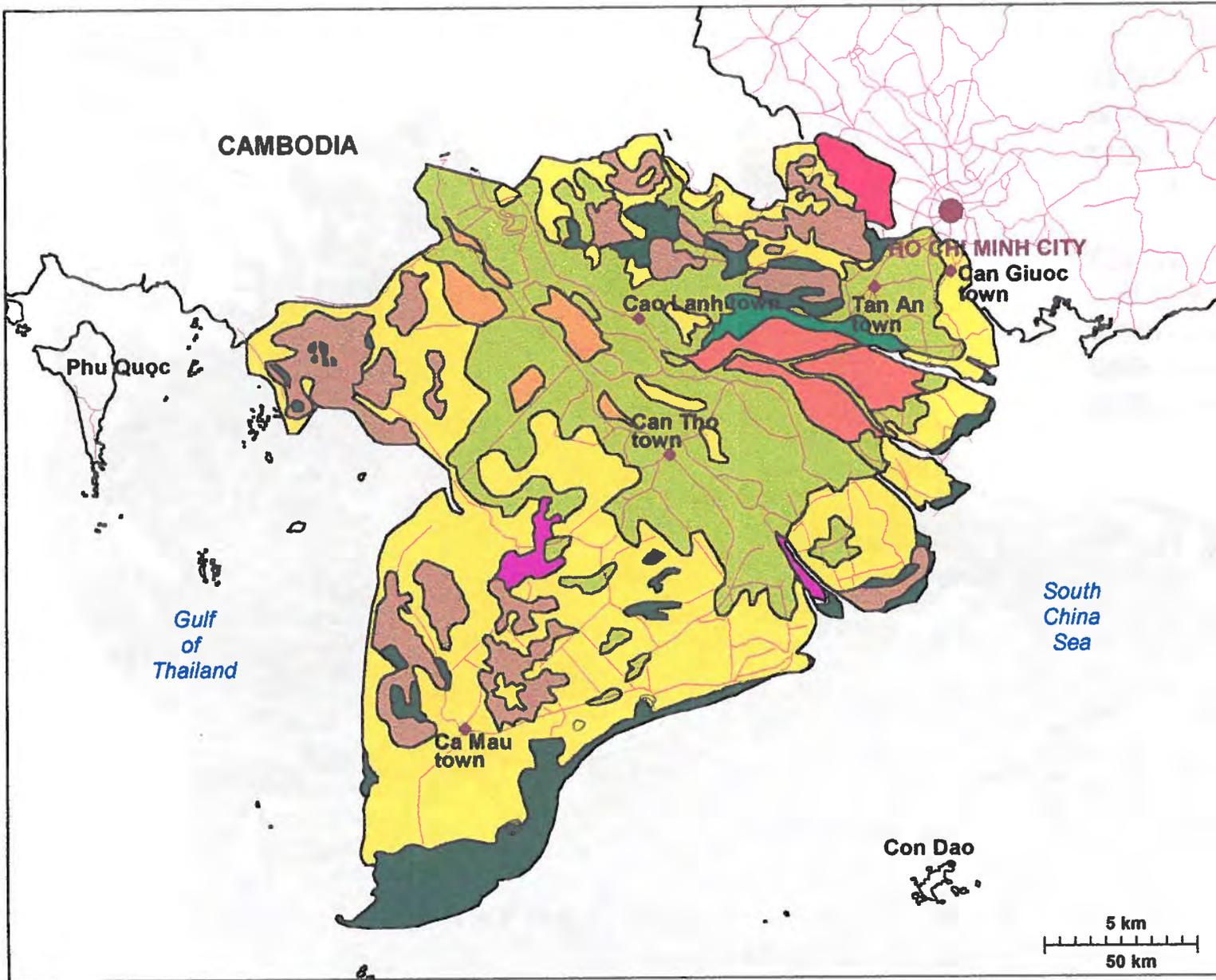
107°27'

PRESENT LAND USE MAP OF THE MEKONG DELTA



103°45'

11°25'



LEGEND

-  Triple rice crops
-  Double rice crops
-  Single rice crops
-  Double rice crop-upland crops
-  Double rice crop-fruit trees and coconuts
-  Single rice crops-Upland crops
-  Industrial crops (pineapple, sugarcane)
-  Uncultivated area
-  Forest (melaleuca, mangrove)
-  International border
-  Road

Gulf of Thailand

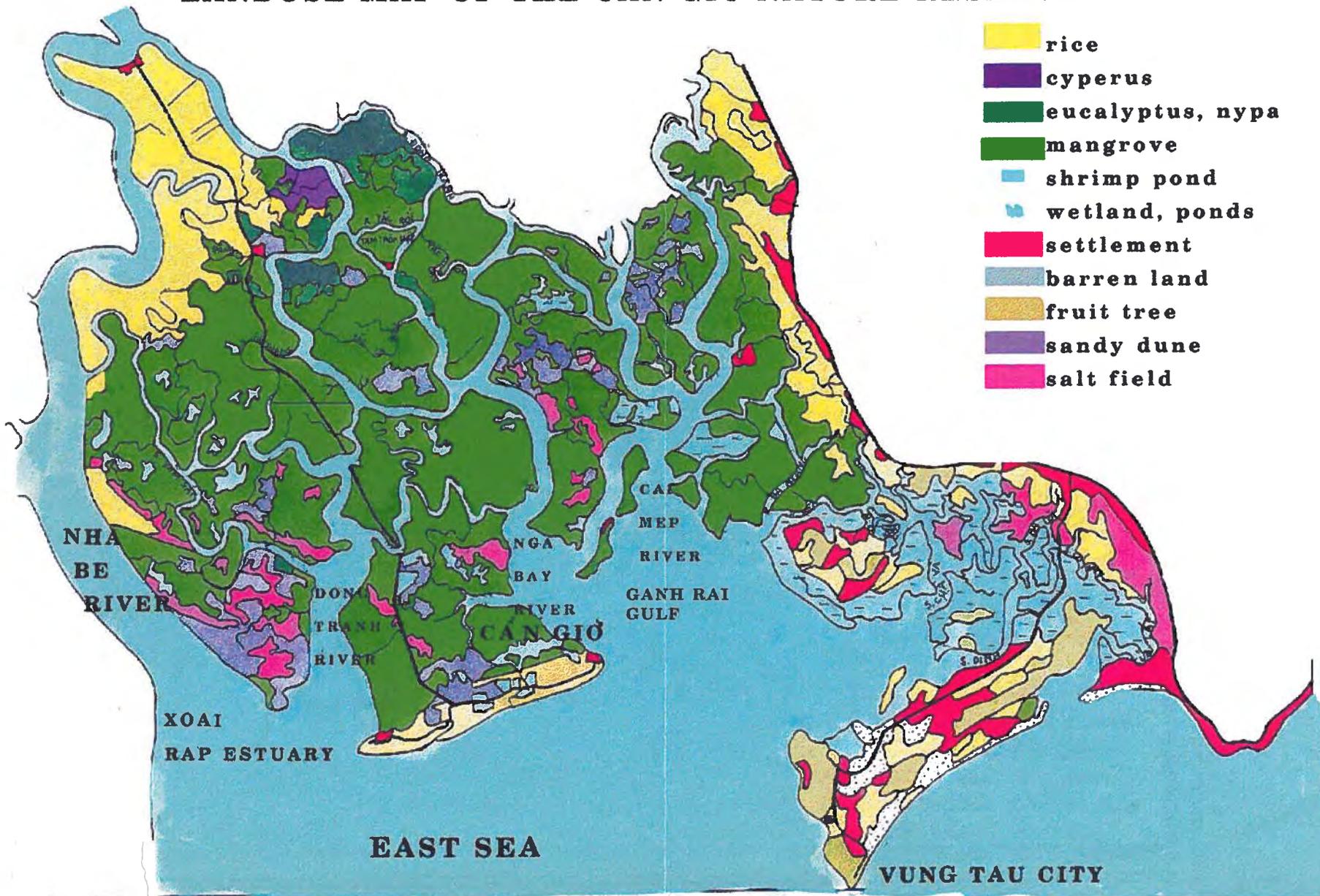
South China Sea



8°25'

107°27'

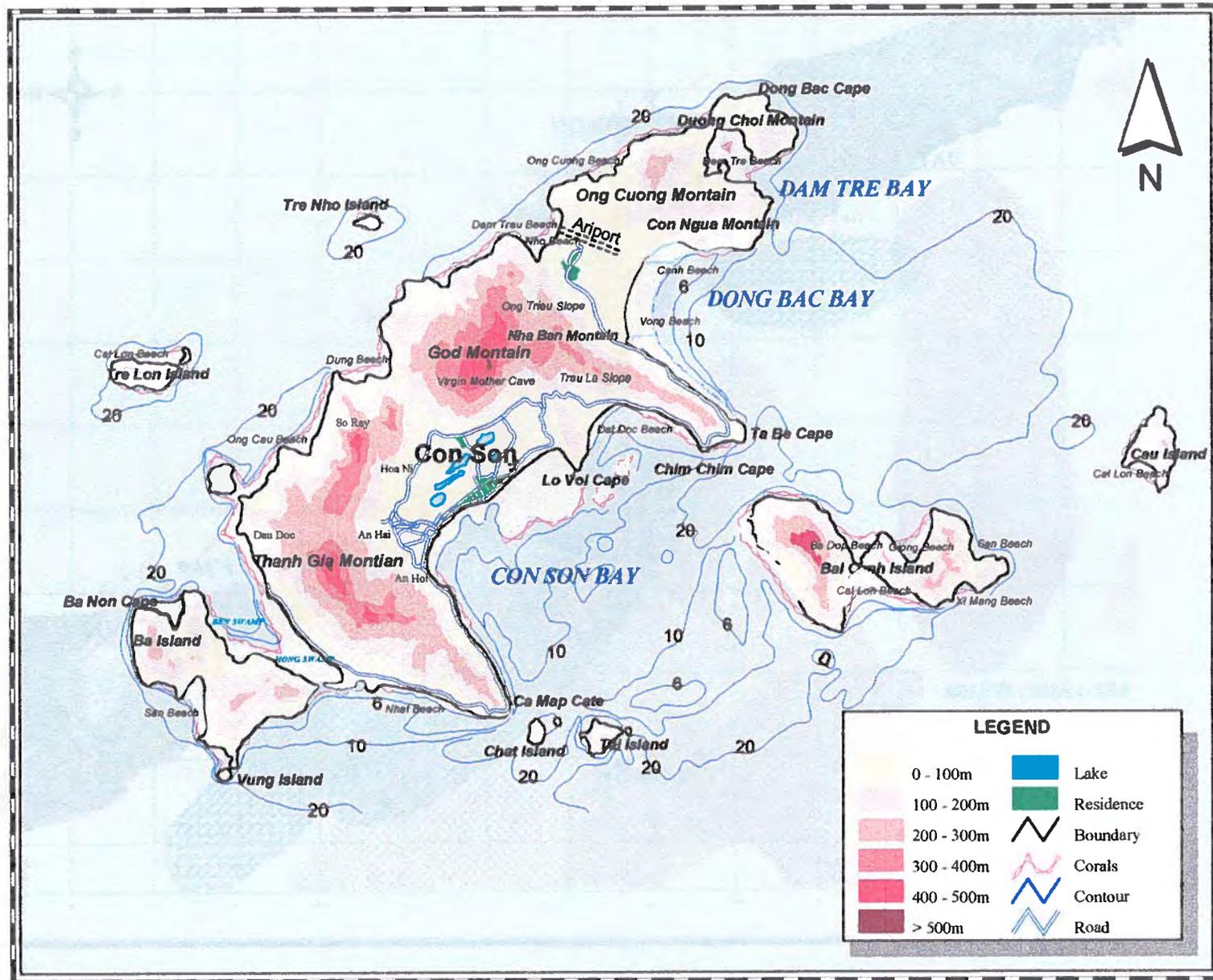
LANDUSE MAP OF THE CAN GIO NATURE RESERVE



- rice
- cyperus
- eucalyptus, nypa
- mangrove
- shrimp pond
- wetland, ponds
- settlement
- barren land
- fruit tree
- sandy dune
- salt field

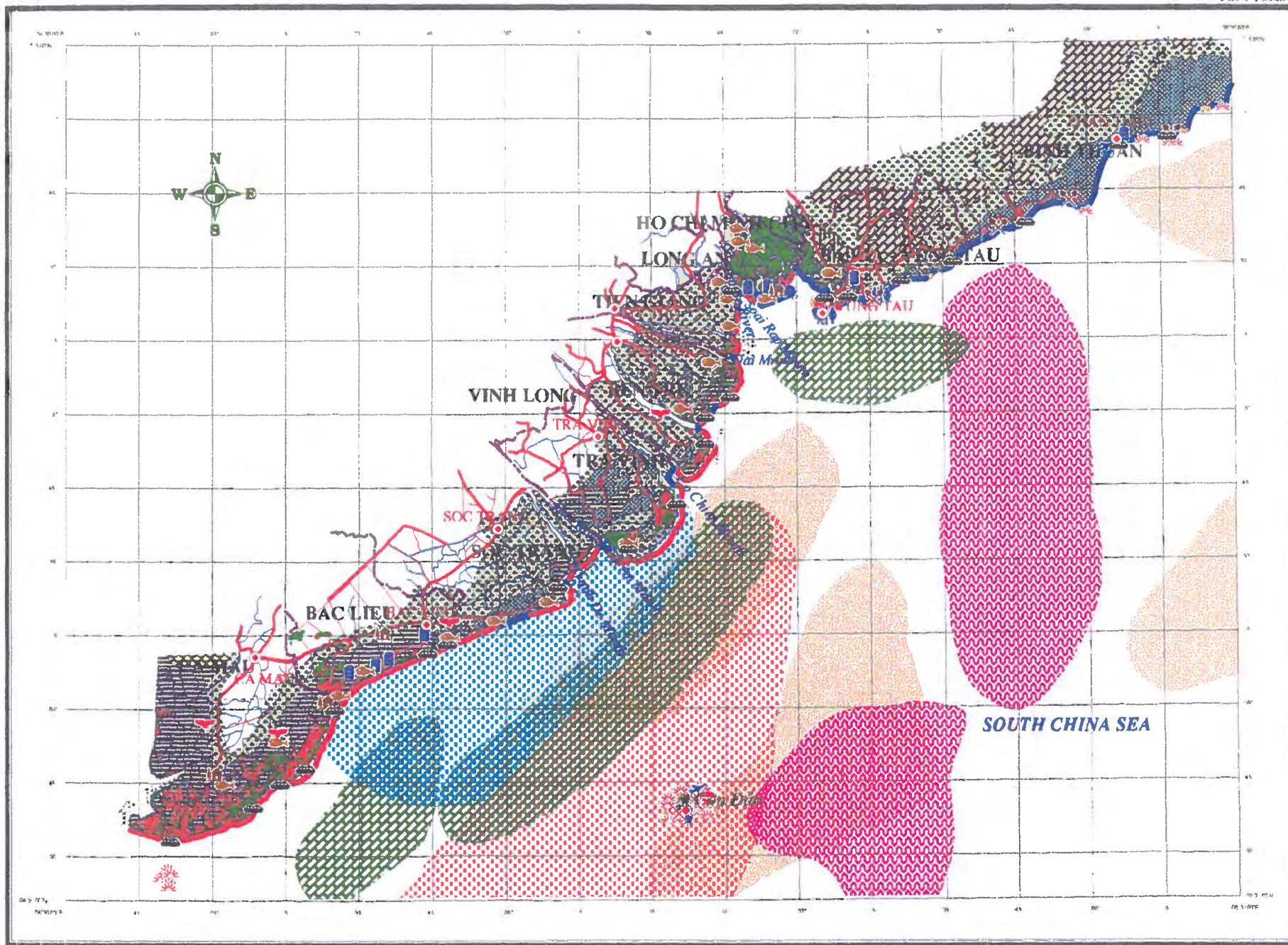


CON DAO ISLAND ARCHIPELAGO



OIL SPILL SENSITIVITY MAP AND MANGROVE CHANGE FOR 1990-1995

SCALE 1:200,000



- Port
 - Bird Ground
 - Mineral Mining Area
 - Natural Reserves
 - Tourism Area, Swim Beach
 - Protected Forest
 - Factory, Enterprise
 - Salt Field
 - Coral Reef
 - Airport
 - Town, City
 - Pond for Aquaculture
 - Other Road
 - Cargo Road
 - River, Sea Coast Line
- OIL SPILL SENSITIVE LEVELS**
- High Sensitive
 - Very Low Sensitive
 - Moderately Sensitive
 - Low Sensitive
 - Very High Sensitive
 - Provincial Boundary
- MANGROVES**
- Mangrove Lost Area for 1990-1995
 - Newly Planted Mangrove Area for 1990-1995
 - Mangrove Cover in 1990
- SOIL STRUCTURE**
- Mud Coast
 - Sand - Mud Coast
 - Pebble Coast
 - Sand Coast
 - Peat Coast
 - Non Classified Stone Coast
- MORPHOLOGY**
- Grind Area of Low Hills and Rusted Mountain
 - Sea-Wind Born Grind Accumulated Area
 - River-Sea Born Moderately Smooth Accumula
 - Sea-Marsh Born Swamp Accumulated Area
 - River-Marsh Born Peat Swamp Accumulated A
 - Sea Born Sand Dune
- SAND DUNE**
- Coast Sand Dune
- FISHERY RESOURCES**
- Summer Fish Eggs and Larvae Ground
 - Winter Fish Eggs and Larvae Ground
 - Shimp Ground
 - Cattle Fish Ground
 - Fish Ground