CRITICAL ECOSYSTEM PARTNERSHIP FUND

Ecosystem Profile

Indo-Burma Biodiversity Hotspot

Indochina Region

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EXECUTIVE SUMMARY

The Critical Ecosystem Partnership Fund (CEPF) is designed to safeguard Earth's biologically richest and most threatened regions known as biodiversity hotspots. CEPF is a joint initiative of Conservation International, l'Agence Française de Développement, the Global Environment Facility, the government of Japan, the John D. and Catherine T. MacArthur Foundation, and the World Bank.

The program focuses on biological areas rather than political boundaries and examines conservation threats on a hotspot-level basis. CEPF targets transboundary cooperation in areas of high importance for biodiversity conservation that straddle national borders, or in areas where a regional approach will be more effective than a national approach. CEPF provides civil society with an agile and flexible funding mechanism complementing funding available to government institutions.

The Indo-Burma Hotspot, with its unique assemblages of plant and animal communities and threatened and endemic species, and high levels of threat, is a global priority for conservation. The ecosystem profile focuses on the Indochina Region, which covers 1,496,000 km^2 of land within the hotspot and comprises all non-marine parts of Cambodia, Lao P.D.R., Thailand, and Vietnam, as well as Hainan Island and southern parts of Yunnan, Guangxi, and Guangdong provinces in southern China.

The ecosystem profile for Indochina was developed through a process of consultation and desk study coordinated by BirdLife International in collaboration with the Bird Conservation Society of Thailand, Kadoorie Farm & Botanic Garden, and the WWF Cambodia Program with the technical support of the Center for Applied Biodiversity Science (CABS) at Conservation International. More than 170 stakeholders from civil society, government, and donor institutions were consulted during the preparation of the ecosystem profile. Myanmar is not covered by this ecosystem profile.

The ecosystem profile presents an overview of Indochina in terms of its biodiversity conservation importance, major threats to and root causes of biodiversity loss, socioeconomic context, and current conservation investments. It provides a suite of measurable conservation outcomes, identifies funding gaps, and opportunities for investment, and thus identifies the niche where CEPF investment can provide the greatest incremental value.

The ecosystem profile contains a 5-year investment strategy for CEPF in the region. This investment strategy comprises a series of strategic funding opportunities, termed strategic directions, broken down into a number of investment priorities outlining the types of activities that will be eligible for CEPF funding. Civil society organizations or individuals may propose projects that will help implement the strategy by fitting into at least one of the strategic directions. The ecosystem profile does not include specific project concepts, as civil society groups will develop these as part of their applications for CEPF grant funding.

Conservation Outcomes

The biological basis for CEPF investment in Indochina will be conservation outcomes: the quantifiable set of species, sites, and biodiversity conservation corridors that must be conserved to curb biodiversity loss globally.

The species, site, and corridor outcomes for Indochina were identified during the preparation of the ecosystem profile and then prioritized as part of developing the CEPF niche and investment strategy. Selecting priority sites and corridors enables CEPF investment in site-based and landscape-scale conservation actions to focus on geographic areas (particularly sites) of the highest priority, while selecting priority species enables CEPF investment in species-focused conservation actions to be directed at those globally threatened species with conservation needs that cannot be adequately addressed by site-based and landscape-scale conservation actions alone.

In all cases, the most important selection criteria were urgency for conservation action and opportunity for additional investment. Priority species, sites, and corridors were only selected where current threats, if not mitigated, were predicted to cause extinction of species or the loss of key elements of biodiversity in the case of sites and corridors within the next 20 years.

During the preparation process, 492 species outcomes, 362 site outcomes, and 53 corridor outcomes were defined for Indochina.

Other Important Considerations

The profiling process also included an analysis of threats, socioeconomic features, and current investments to help design the most effective investment strategy. The major threats to biodiversity in Indochina include a combination of economic development and increasing human population. The two over-riding immediate threats facing the region’s plant and animal species are habitat loss and overexploitation. One or both of these are the principle threats to nearly all globally threatened species in the region.

Most protected areas in the region have significant human populations living and/or using resources within their boundaries. In addition, the high proportion of the population living in rural areas and high levels of poverty throughout Indochina mean that natural resources, particularly those of forests, wetlands and grasslands, form a critical component of livelihood strategies for many of the region's inhabitants. Consequently, poverty alleviation and biodiversity conservation are inextricably linked, as both are dependent upon sustainable management of natural resources.

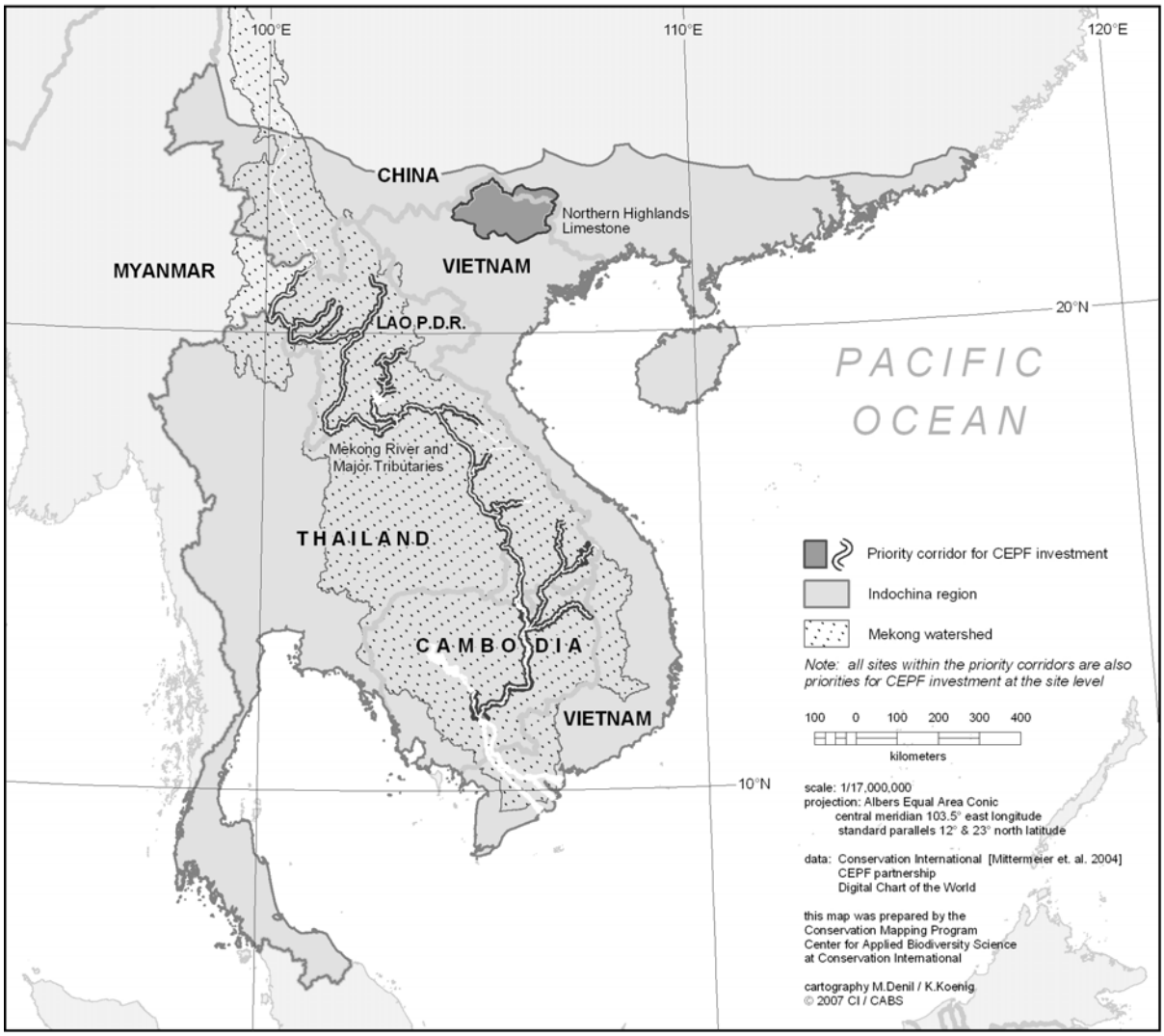
Throughout the region, responsibility for managing natural habitats and species' populations lies primarily with national governments, which, together with international donors, are investing significant resources in biodiversity conservation. However, these investments are not always effective at conserving global biodiversity, and, by implication, supporting the livelihoods of local people who depend upon natural resources, because they are often incorrectly targeted, fail to address the causes of biodiversity loss, or are undermined by incompatible plans and policies of other sectors.

CEPF Niche and Investment Strategy

The CEPF niche for investment in Indochina has been formulated through an inclusive, participatory process that engaged civil society, donor, and government stakeholders throughout the region. Given the very significant investments already being made in biodiversity conservation by international donors and national governments, the relatively limited additional resources available from CEPF can be used most effectively in support of civil society initiatives that complement and better target these existing investments.

Based on the refinement of the full set of outcomes identified, CEPF investments will focus on 67 priority animal species and 28 priority sites in two biodiversity conservation corridors. In addition, all 248 globally threatened plant species in the region will be priorities for investment. Complete lists of the priorities for CEPF investment are included in the ecosystem profile.

Priority Corridors for CEPF Investment in Indochina



As developed through the stakeholder consultation process, the Mekong River and Major Tributaries Corridor does not include the Mekong Delta Wetlands downstream from Phnom Penh.

The CEPF investment strategy for Indochina comprises investment priorities grouped into four strategic directions, which are the results of an extensive process of consultation with civil society and government stakeholders, as well as the CEPF donor partners.

Strategic Directions and Investment Priorities for CEPF in Indochina

CEPF Strategic Direction	CEPF Investment Priorities
1. Safeguard priority globally threatened species in Indochina by mitigating major threats	1.1 Identify and secure core populations of 67 globally threatened species from overexploitation and illegal trade
	1.2 Implement public awareness campaigns that reinforce existing wildlife trade policies and contribute to the reduction of consumer demand for 67 globally threatened species and their products
	1.3 Investigate the status and distribution of globally threatened plant species, and apply the results to planning, management, awareness raising and/or outreach
	1.4 Assess the global threat status of selected freshwater taxa and integrate the results into planning processes for the conservation of wetland biodiversity and development plans in the Mekong River and its major tributaries
	1.5 Conduct research on 12 species for which there is a need for greatly improved information on their status and distribution
	1.6 Publish local-language reference materials on globally threatened species
2. Develop innovative, locally led approaches to site-based conservation at 28 key biodiversity areas	2.1 Establish innovative stakeholder-based conservation management and caretaking initiatives at 28 key biodiversity areas.
	2.2 Develop regional standards and programs that address overexploitation of biodiversity and pilot at selected sites
3. Engage key actors in reconciling biodiversity conservation and development objectives, with a particular emphasis on the Northern Limestone Highlands and Mekong River and its major tributaries	3.1 Support civil society efforts to analyze development policies, plans and programs, evaluate their impact on biodiversity and ecosystem services, and propose alternative development scenarios and appropriate mitigating measures
	3.2 Support initiatives that leverage support for biodiversity conservation from development projects and programs
	3.3 Conduct targeted outreach and awareness raising for decisionmakers, journalists, and lawyers
4. Provide strategic leadership and effective coordination of CEPF investment through a regional implementation team	4.1 Build a broad constituency of civil society groups working across institutional and political boundaries toward achieving the shared conservation goals described in the ecosystem profile

Conclusion

In terms of species diversity and endemism, the Indochina region of the Indo-Burma Hotspot is one of the most biologically important regions on the planet. Discoveries of new species during the 1990s focused the attention of the global conservation community on the Indochina region. Changing political climates in several countries meant that increasing amounts of international donor assistance, including conservation investment, flowed into most countries in the region from the early 1990s onwards.

While CEPF supports civil society organizations, these groups will also have to build partnerships with government institutions, since many of the important site outcomes are protected areas vested under the management mandate of the respective government institutions responsible for biodiversity conservation. As partnership building is part of the CEPF mandate, joint civil society-government initiatives fit within the scope of CEPF. But large areas of the landscape matrices in the corridor outcomes are owned and managed by civil society. Thus, conservation in these corridor outcomes will have to involve and include local communities, community-based organizations, and NGOs.

International donors are already providing considerable support to help resolve some of these issues, yet funding opportunities exist in many of the corridor and site outcomes identified in the profile, particularly since many major donors do not have specific biodiversity conservation foci in their projects. This is CEPF's niche and focus for investment in the Indochina region.

INTRODUCTION

The Critical Ecosystem Partnership Fund (CEPF) is designed to safeguard the world's biologically richest and threatened regions known as biodiversity hotspots. It is a joint initiative of Conservation International (CI), l'Agence Française de Développement, the Global Environment Facility (GEF), the Government of Japan, the John D. and Catherine T. MacArthur Foundation, and the World Bank. Conservation International administers the global program through a CEPF Secretariat.

The Indo-Burma Hotspot, with its unique assemblages of plant and animal communities and threatened and endemic species, and high levels of threat, is a global priority for conservation.

A fundamental purpose of CEPF is to engage civil society, such as community groups, nongovernmental organizations (NGOs), academic institutions and private enterprises, in biodiversity conservation in the hotspots. To guarantee their success, these efforts must complement existing strategies and programs of national governments and multilateral and bilateral donors. CEPF promotes working alliances among diverse groups, combining unique capacities and reducing duplication of efforts for a comprehensive, coordinated approach to conservation. CEPF focuses on biological areas rather than political boundaries and examines conservation threats on a hotspot-level basis. CEPF targets trans-boundary cooperation, in areas of high importance for biodiversity conservation that straddle national borders, or in areas where a regional approach will be more effective than a national approach. CEPF aims to provide civil society with an agile and flexible funding mechanism complementing funding available to government institutions.

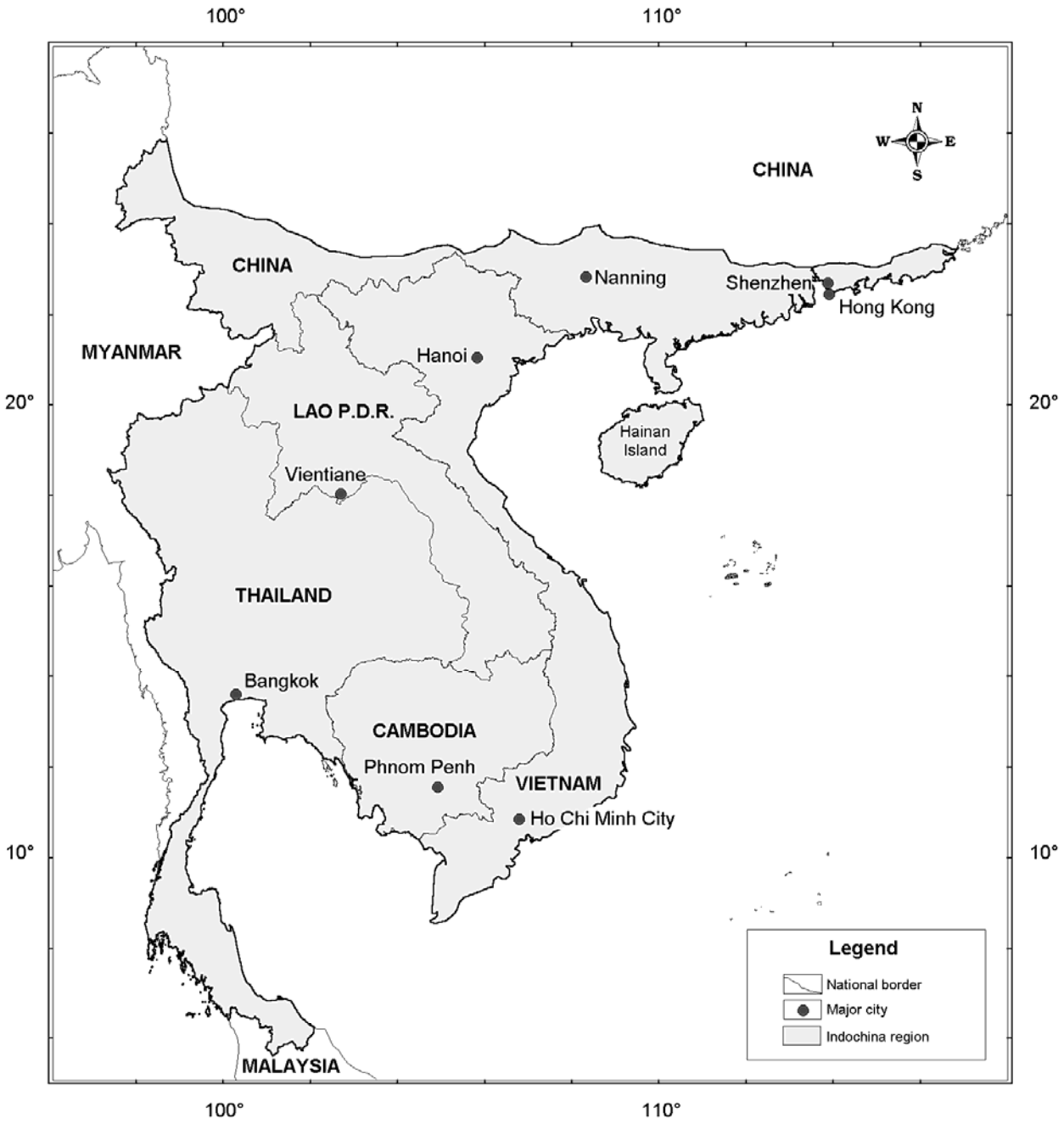
The Indo-Burma Hotspot ranks in the top 10 hotspots for irreplaceability and in the top five for threat, with only 5 percent of its natural habitat remaining and holding more people than any other hotspot.

This document represents the ecosystem profile for the Indochina region of the hotspot. The region covers a total land area of 1,496,000 km^2, and comprises all non-marine parts of Cambodia, Lao P.D.R., Thailand and Vietnam, as well as those parts of southern China in Biounits 6 and 10 (i.e. Hainan Island and southern parts of Yunnan, Guangxi, and Guangdong provinces) (Figure 1).

Although stakeholders in Myanmar were consulted during the CEPF preparation phase for Indochina, the country is not covered by this ecosystem profile. However, as Myanmar supports some of the most intact natural habitats and species communities remaining in Indochina and represents a major funding gap, the results of the CEPF preparation process in Myanmar have been synthesized by BirdLife International into a separate document that presents investment opportunities in biodiversity conservation by civil society in the country. Investment priorities presented in the Myanmar document are not eligible for CEPF funding at this time, however it is hoped that the document will be used to leverage funding from other sources parallel to CEPF investments elsewhere in the region. In addition, it is hoped that the document will catalyze the preparation of a

biodiversity action plan for Myanmar, a commitment under the Convention on Biological Diversity (CBD).

Figure 1. Map of the Indochina Region



THE ECOSYSTEM PROFILE

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Background

The ecosystem profile for Indochina was developed through a process of consultation and desk study coordinated by BirdLife International in collaboration with the Bird Conservation Society of Thailand (BCST), Kadoorie Farm & Botanic Garden (KFBG), and the WWF Cambodia Program with the technical support of the Center for Applied Biodiversity Science (CABS) at CI. More than 170 stakeholders from civil society, government, and donor institutions were consulted during the preparation of the ecosystem profile.

During the preparation process, data on biodiversity, socioeconomic and institutional context, and ongoing and planned conservation investments in the five countries in the region were compiled and synthesized by the ecosystem profile team, with support from CABS, then reviewed at a series of expert roundtables. The first expert roundtable was held in Vientiane, Lao P.D.R.; the second was held in Hanoi, Vietnam; the third was held in Phnom Penh, Cambodia; and the fourth was held in Bangkok, Thailand. Due to the outbreak of the SARS virus at the time, no expert roundtable was held in southern China but, instead, stakeholders were consulted individually. The expert roundtables also provided an opportunity for stakeholders to propose biological and thematic priorities for CEPF investment. Moreover, the expert roundtables raised the profile of CEPF in the region and generated support for the CEPF investment strategy among stakeholders. Subsequent to the expert roundtables, the draft biological and thematic priorities for CEPF investment were reviewed by the CEPF Working Group comprised of technical staff from each of the CEPF donor partner organizations and further revised based upon its recommendations.

The biological basis for CEPF investment in Indochina will be conservation outcomes: the quantifiable set of species, sites, and biodiversity conservation corridors that must be conserved to curb biodiversity loss globally. Conservation outcomes present quantitative and justifiable targets against which the success of conservation investments can be measured. The conservation outcomes for the region comprise extinctions avoided (species outcomes), areas protected (site outcomes), and corridors created (corridor outcomes). As CEPF alone cannot achieve all of the conservation outcomes in the region, a set of priority species, sites, and corridors were selected on the basis of biological importance, urgency for conservation action, and opportunity for additional conservation investment to ensure that CEPF investments complement other conservation investments and make the maximum contribution to global biodiversity conservation.

During the preparation process, 492 species outcomes, 362 site outcomes, and 53 corridor outcomes were defined for Indochina. Through consultation with stakeholders and the CEPF donor partners, these biological priorities were further refined to 67 priority species, 28 priority sites, and two priority corridors. In addition, the thematic priorities for CEPF investment were formulated as investment priorities, grouped into four strategic directions.

BIOLOGICAL IMPORTANCE OF INDOCHINA

Geography, Climate, and History

Indochina boasts an impressive geographic diversity. It spans more than 3,500 meters in elevation, from the mountain peaks of Yunnan province, China, down to a coastline along the Andaman Sea, Gulf of Thailand and South China Sea. The region encompasses a number of complete mountain ranges, such as the Annamite Mountains, and includes parts of several others, including eastern extensions from the Himalayas. The region features isolated massifs and plateaus, extensive areas of limestone karst and four of Asia's largest rivers: the Mekong, Salween, Red and Pearl (Zhujiang). Its sweeping expanse of level lowlands embraces several fertile floodplains and deltas and includes Tonle Sap Lake, Southeast Asia's largest and most productive freshwater lake.

As a result of a high diversity of landforms and climatic zones, Indochina supports a wide variety of habitats and thus high overall biodiversity. This diversity has been further increased by the development of areas of endemism as a result of the region's geological and evolutionary history. Fluctuating Pleistocene sea levels and the resulting repeated isolation and reconnection of ecosystems and plant and animal populations have helped to promote speciation (van Dijk *et al*. 1999), while fluctuations in the relative extent of evergreen forest during glacial episodes have allowed evergreen forest species to evolve in isolation, and further contributed to the high levels of endemism in the region (Baltzer *et al*. 2001). Centers of plant and animal endemism in the region include the Annamite Mountains and the highlands of southern China and northern Vietnam.

Most parts of the region experience a strongly seasonal climate, with the climate of the south and west of the region dominated by a southwest monsoon season of variable duration and the climate of the northeast of the region dominated by the northeast

monsoon in the northern summer. During the northern winter months, drier conditions prevail throughout much of the region under the influence of stable continental Asian high-pressure systems. Within the region, however, a complex array of microclimates exists, with mean annual precipitation varying from under 800 mm in coastal areas of central Vietnam (Nguyen Khanh Van 2000) to almost 8,000 mm in some parts of the central Annamite Mountains (WWF/EC 1997).

Habitats and Ecosystems

Forests are among the most species-rich and widespread ecosystems in the region. The variety of forest types is immense, from evergreen forests with a high diversity of canopy tree species, through semi-evergreen forests and mixed deciduous forests, to relatively species-poor deciduous dipterocarp forests. Limestone karst supports distinctive vegetation formations, with high levels of endemism. Mono-dominant and mixed formations of conifers are distributed in montane areas, while open, fire-climax coniferous formations are distributed on drier hills and plateaus subject to regular burning. Lowland floodplain swamp or flooded forests are a feature of the permanently and seasonally inundated lowlands, most especially in Cambodia, and mangrove forests are distributed in coastal areas.

Lowland evergreen forests are among the most species-rich in plants in the whole region, and are characterized by significant plant and animal endemism. Lowland evergreen forests formerly covered large areas of peninsular Thailand, as well as smaller areas elsewhere in the region, including the Annamese lowlands of Vietnam. However, due to the abundance of commercially valuable timber species in these forests, they have been among the most heavily exploited of all habitats. Large areas have been cleared and much of the remaining forest is threatened with conversion to cash crops and subsistence agriculture.

Montane evergreen forests are distributed in mountainous areas throughout the region, including the Annamite Mountains of Lao P.D.R. and Vietnam, the Cardamom mountains of Cambodia and the highlands of southern China and northern Vietnam. Relative to most other habitats in the region, these forests support high levels of endemism in amphibians, birds and plants, although less so in mammals. Lower montane evergreen forests have similar plant species richness to lowland evergreen forests, while upper montane evergreen forests are less species rich, and dominated by members of the Fagaceae, Lauraceae and Magnoliaceae families. At higher elevations, on summits and ridge crests, stunted, xerophytic formations dominated by *Rhododendron* spp. and other members of the Ericaceae family are found. Relative to lowland evergreen forests, montane evergreen forests in Indochina are generally less threatened by overexploitation. However, conversion to cash crops and other land uses is leading to extensive clearance of lower montane evergreen forest in many areas.

Semi-evergreen and mixed deciduous forests are widely distributed in lowland and hill areas throughout the region. Semi-evergreen and mixed deciduous forests are less rich in plant species than lowland evergreen forests and generally support lower levels of plant

and animal endemism. These forests support a number of commercially valuable timber species and are targeted for logging in many areas.

Deciduous dipterocarp forests are open forests with grassy under stories, which occur in areas with a prolonged dry season. These forests support relatively few tree species, although they support distinctive plant and animal communities. Formerly these forests covered much of the center of the region, but intact tracts are now largely restricted to western Thailand, and the plains of northern and northeastern Cambodia and adjacent areas of Lao P.D.R. and Vietnam. In these areas, deciduous dipterocarp forests frequently occur in mosaics with patches of semi-evergreen forest, grassland and wetlands, many of which are subject to seasonal monsoon inundation. Until recently, these landscapes supported such impressive herds of large ungulates that they were considered one of the "great gamelands of the world" (Wharton 1957).

The limestone karst formations that are distributed throughout the region, in some places as extensive belts and in other places as isolated outcrops, support highly distinctive ecosystems rich in endemic species. Although, to date, taxonomic groups such as primates and orchids have received the greatest amount of conservation investment and scientific study, limestone ecosystems are of equal, if not greater, significance for other, generally less well-known groups, including cave fish, land snails, and deep-soil invertebrates. While the unsuitability of limestone karst for agriculture means that forest on limestone is generally less threatened by clearance than other forest types in the region, the animal and plant species of limestone ecosystems are often threatened by overexploitation, while the karst formations themselves are, in places, severely threatened by quarrying (L. Deharveng *in litt.* 2003).

Seasonally inundated swamp forest ecosystems surround Tonle Sap Lake in Cambodia. Formerly these ecosystems were also extensive in the deltas and lower floodplains of the Mekong and Chao Phraya rivers but are now restricted to isolated fragments. These ecosystems are important for a number of globally threatened species, notably large waterbirds.

Mangrove forests were once distributed widely in coastal areas, particularly near estuaries, but are now greatly reduced, as a result of fuelwood extraction and conversion to aquaculture. Other important coastal habitats in the region include intertidal mud- and sandflats, which are the key habitat for many migratory shorebirds. The largest and ecologically most important intertidal ecosystems are found near large rivermouths, most importantly in the Red River and Mekong Deltas of Vietnam, the Inner Gulf of Thailand and the Pearl River Delta in southern China.

Grassland ecosystems range from small, seasonally wet meadows within dry forest landscapes, to the extensive, seasonally inundated grasslands that characterize the inundation zone of Tonle Sap Lake. Seasonally inundated grasslands, which support distinctive assemblages of species, including several globally threatened species, are one of the most threatened ecosystems in the region. They were formerly well distributed in

central Thailand and the Mekong Delta, from where they have almost completely disappeared through conversion to agriculture, aquaculture and forestry.

Freshwater ecosystems range from the fast-flowing rocky mountain streams to wide, slow-flowing lowland rivers, such as the Mekong and San, braided by large, partly vegetated sand and rock bars. Expansive open freshwater lakes include Tonle Sap Lake in Cambodia. Rapids are particularly notable as sites of high species diversity, endemism and periodic congregations of fish. Freshwater ecosystems support a large number of globally threatened species, including some of the most threatened species in the region, and provide for the livelihoods of a substantial proportion of the region's human population. However, they are frequently subjected to high levels of human use, often with negative implications for biodiversity. Specific threats to freshwater ecosystems include unsustainable fishing practices and changes to river flow patterns, such as blasting of rapids for navigation channels and hydropower dam construction.

Species Diversity and Endemism

Indochina encompasses all or part of seven Endemic Bird Areas defined by BirdLife International (Stattersfield *et al*. 1998), 12 of the Global 200 Ecoregions defined by WWF (Olson *et al*. 2000) and 24 Centers of Plant Diversity defined by the World Conservation Union (IUCN) (Davis *et al*. 1995). Endemism is generally associated with physical islands (for example, Hainan Island) and islands of habitat (for example, montane isolates, karst limestone patches, and areas of lowland evergreen forest that have been isolated during glacial episodes).

Different estimates put the total vascular plant diversity of Indochina somewhere between 10,000 and 20,000 species, and even apparently conservative estimates suggest that as many as 50 percent of the angiosperms and gymnosperms are endemic to the region (Davis *et al*. 1986, Campbell and Hammond 1989, Davis *et al*. 1995, van Dijk *et al*. 1999). Irrespective of their precision, these figures indicate that Indochina has extraordinarily high plant diversity, and is a major center of plant endemism (Davis *et al*. 1995). The complex merging of floras in the highlands of Southeast Asia (a region approximately equivalent to Indochina) has no parallel in any other part of the world (de Laubenfels 1975); it represents the convergence of several distinctive temperate, tropical and subtropical floristic regions: the Indian, Malesian (Sundaic), Sino-Himalayan and Indochinese (Schmid 1989). Forest ecosystems support the highest levels of plant species richness, among which montane forests and lowland evergreen forests are the most species-rich. Plant families particularly notable for their high species diversity in the region include the Orchidaceae and Dipterocarpaceae.

On the basis of current knowledge, the Indo-Burma Hotspot harbors about 430 mammal species, of which more than 70 species and seven genera are endemic (Mittermeier *et al.* 2004). A minimum of 1,200 bird species have been recorded in the hotspot, of which approximately 10 percent are endemic; the majority are resident within the hotspot but a significant proportion are highly migratory, most being species that spend the northern winter in the region and breed further north. Reptiles number nearly 520 species in over 140 genera, of which 12 genera and more than 200 species are endemic. Of the minimum

280 amphibian species (in approximately 40 genera) known to occur in the hotspot, more than 150 are endemic (Mittermeier *et al.* 2004). Although precise figures are unavailable, Indochina harbors the majority of vertebrate species that occur in the Indo-Burma Hotspot.

Freshwater biodiversity in Indochina is still very poorly known. In 1989, more than 900 freshwater fish species were known from mainland Southeast Asia (a region with a large overlap with Indochina) (Kottelat 1989, Kottelat and Whitten 1996), of which about half might be expected to be endemic (van Dijk *et al*. 1999). The Mekong Basin has more than 500 fish species, exceeded only by the Amazon and Congo Basins (Dudgeon 2000a). Overall, knowledge of freshwater biodiversity is still at the exploratory stage, with numerous taxonomic uncertainties, large areas unsurveyed, and many species known only from a single locality (Kottelat and Whitten 1996, Baltzer *et al*. 2001). The large number of fish species newly described in recent years (e.g. Kottelat 1998, 2000, Vidthayanon 2003, Vidthayanon and Jaruthanin 2002, Vidthayanon and Kottelat 2003) suggests that many more fish species may await discovery and description. In general, other freshwater taxa remain significantly less studied than fish. One exception is the Pomatiopsidae, a family of aquatic gastropods, for which the Mekong Basin represents a remarkable centre for radiation, with more than 110 species; this suggests that similarly high diversities might be found in other aquatic invertebrate taxa.

While it is abundantly clear that Indochina supports extraordinary vertebrate species diversity, detailed data on the diversity of many plant, invertebrate, and fish taxa are lacking. Even among mammals, birds and turtles, new species for science are still being regularly discovered in the region, including saola (*Pseudoryx nghetinhensis)* (Vu Van Dung *et al*. 1993), large-antlered muntjac (*Muntiacus vuquangensis)* (Do Tuoc *et al*. 1994, Timmins *et al*. 1998), Annamite muntjac (*M. truongsonensis)* (Pham Mong Giao *et al*. 1998, Timmins *et al*. 1998), Annamite striped rabbit (*Nesolagus timminsi)* (Averianov *et al.* 2000), Laotian rock rat (*Laonastes aenigmamus)* (Jenkins *et al.* 2005), golden-winged laughingthrush (*Garrulax ngoclinhensis)* (Eames *et al*. 1999a), chestnut-eared laughingthrush *G. konkakinhensis* (Eames and Eames 2001), black-crowned barwing (*Actinodura sodangorum)* (Eames *et al*. 1999b), Mekong wagtail (*Motacilla samvaesnae)* (Duckworth *et al*. 2001), and Zhou's box turtle (*Cuora zhoui)* (Zhao *et al.* 1990). The continued discovery of new species and new records for the region, combined with recent advances in taxonomy that are resulting in single widespread species being split into several different species (e.g. Fritz *et al.* 1997, Alstrom 1998), are leading to continued increases in known species richness and endemism.

Globally Threatened Species

Globally threatened species are the principal basis for the identification of conservation outcomes for Indochina and, consequently, the determination of investment priorities for CEPF. A significant proportion of the plant and vertebrate species in Indochina have been assessed as globally threatened, following the global threat criteria of IUCN-The World Conservation Union (1994). For many groups, however, particularly invertebrates, fish, reptiles, fungi, and plants, comprehensive global threat assessments have not been undertaken for species occurring in Indochina. Consequently, these groups can be

considered to potentially include large numbers of globally threatened species not yet classified as globally threatened by IUCN.

Mammals

A higher percentage of mammal species are considered globally threatened than any other class, with a staggering 70 percent of mammals endemic to a single biodiversity hotspot being listed as globally threatened (Myers *et al*. 2000, Brooks *et al*. 2002, IUCN 2002a). Globally, most threatened mammals are associated with forest ecosystems, and this is also the case in Indochina. Similarly, overexploitation and habitat loss, the two principal threats to the survival of mammal species globally, are also the major threats in the region.

Indochina supports three Critically Endangered, four Endangered and eight Vulnerable primate species (IUCN 2002a). Eight globally threatened primate species are endemic to the region: pygmy loris (*Nycticebus pygmaeus)*, yellow-cheeked crested gibbon (*Nomascus gabriellae*, pileated gibbon (*Hylobates pileatus)*, Delacour's leaf monkey (*Trachypithecus delacouri)*, white-headed leaf monkey (*T. poliocephalus)*, red-shanked douc (*Pygathrix nemaeus)*, black-shanked douc (*P. nigripes)* and Tonkin snub-nosed monkey (*Rhinopithecus avunculus)*. Unresolved taxonomy within primates, especially in the genera *Nomascus/Hylobates*, *Trachypithecus/Semnopithecus*, *Pygathrix* and *Nycticebus*, may result in several additional species being recognized, some of which will qualify as globally threatened (e.g. Feiler and Nadler 1997, Nadler 1997, Groves 1998, discussion in Duckworth *et al*. 1999, Groves 2001).

Other globally threatened, endemic mammals include the recently described saola, which is confined to the evergreen forests of the Annamite Mountains of Lao P.D.R. and Vietnam (Schaller and Rabinowitz 1995). Eld's deer (*Cervus eldi)* occurs in isolated populations recognized as four different subspecies, two of which are endemic to Indochina: *C. e. siamensis* and *C. e. hainanus* (Wemmer 1998). Another enigmatic mammal is a form of otter civet known only from a single specimen from northern Vietnam (Osgood 1932) and unconfirmed reports from northeastern Thailand and southern Vietnam (Schreiber *et al.* 1989); some authorities (e.g. Corbet and Hill 1992) consider that this form warrants specific status as Lowe's otter civet (*Cynogale lowei)*, distinct from otter civet (*C. bennettii)*, which is otherwise known from the region only from peninsular Thailand.

Several globally threatened mammals with more widespread global distributions occur in the region, including tiger (*Panthera tigris)*, Asian elephant (*Elephas maximus)*, banteng (*Bos javanicus)*, and gaur (*B. gaurus)* (e.g. Duckworth and Hedges 1998). These species are all severely threatened by overexploitation, and require species-focused conservation interventions. Several of these species remain widely distributed in the region but only as small, isolated groups or individuals, and only some of the larger, more intact blocks of natural habitat support potentially viable populations. For instance, the only known tiger populations likely to represent long-term hope for the species' survival in the region are in western and peninsular Thailand, the Annamite Mountains in Lao P.D.R. and adjacent areas of Vietnam, and Nam Et and Phou Louey protected areas in northeastern Lao

P.D.R. (see Duckworth and Hedges 1998). For wild cattle and Asian elephant conservation, Mondulkiri province, Cambodia and contiguous parts of Vietnam, and the Western Forest Complex in Thailand represent the best long-term prospects.

At least one mammal species that occurred in the region is believed to have already gone extinct globally: Schomburgk's deer (*Cervus schomburgki),* which inhabited the lowland plains and swamps of central Thailand; the last known individual was killed in 1938 (Lekagul and McNeely 1977). A second species that may have gone extinct globally is kouprey *Bos sauveli*, a magnificent large ungulate that, at least formerly, inhabited the dry forest landscapes of central Indochina (Wharton 1957). Other large mammals now on the verge of extinction regionally include lesser one-horned rhinoceros *Rhinoceros sondaicus* (a single remnant population is confirmed at a single site in southern Vietnam; Polet *et al.* 1999) and Sumatran rhinoceros, also known as hairy rhinoceros (*Dicerorhinus sumatrensis)* (a remnant population is confirmed in Indochina at a single site in southern Thailand).

A number of mammal species in the region currently not assessed as globally threatened are under very high levels of threat. Among those in urgent need of conservation action are Chinese pangolin (*Manis pentadactyla),* sunda pangolin (*M. javanica),* and, perhaps, some lorises *Nycticebus* spp. and Oriental small-clawed otter (*Amblonyx cinereus),* which are heavily exploited to supply the wildlife trade. There is a need to reassess the global threat status of such species.

Birds

Each major ecosystem in Indochina supports a suite of globally threatened bird species. Of these ecosystems, montane forests are the best represented within protected area networks and, generally, under the lowest threat. However, montane forest ecosystems support many restricted-range species, some of which are threatened by habitat loss. Lowland forest, coastal, freshwater wetland, riverine and grassland ecosystems generally receive less conservation effort than montane forest ecosystems, and are under higher levels of threat. It is these ecosystems that support the greatest numbers of Endangered and Critically Endangered bird species.

The region's rarest and most enigmatic bird is white-eyed river-martin (*Eurychelidon sirintarae)* known from wetlands in central Thailand, of which there are no confirmed records since 1978; the species is Critically Endangered (BirdLife International 2001).

Among the most charismatic globally threatened birds are two Critically Endangered species: giant ibis (*Thaumatibis gigantean)* and white-shouldered ibis (*Pseudibis davisoni),* once relatively widespread in Indochina, but now largely confined to the open deciduous dipterocarp forests and wetlands of Cambodia's lowland plains (Davidson *et al*. 2001). Together with a suite of other species, particularly storks, they form a bird mega-fauna unique to the region, including greater adjutant (*Leptoptilos dubius)* (Endangered), lesser adjutant (*L. javanicus)* and sarus crane (*Grus antigone)* (both Vulnerable), which require species-focused interventions at the landscape scale to conserve viable populations. Globally significant numbers of greater adjutant and lesser

adjutant, together with spot-billed pelican (*Pelecanus philippensis)* and milky stork (*Mycteria cinerea)* (both Vulnerable), contribute to one of the region's most impressive natural phenomena: the biggest breeding colony of large waterbirds in the whole of Asia, in the flooded forests of Prek Toal in the northwestern corner of Tonle Sap Lake. Unfortunately, competition with lucrative commercial fishing concerns and mass collection of waterbird eggs are major threats to this colony (Goes and Hong Chamnan 2002).

Indochina supports a significant number of globally threatened migratory waterfowl and shorebird species. For these species, coastal ecosystems are particularly important, although some also use freshwater wetlands. Intertidal mudflats and coastal lagoons are the key habitats for black-faced spoonbill (*Platalea minor)*, spotted greenshank (*Tringa guttifer)* and spoon-billed sandpiper (*Eurynorhynchus pygmeus)*, species that breed in northeast Asia and occur as passage migrants and/or winter visitors to the region's coasts. The Pearl River Delta in China, the coastal zones of the Red River and Mekong Deltas in Vietnam and the Inner Gulf of Thailand are all of known global importance for some or all of these species (BirdLife International 2001).

Other globally threatened bird species requiring species-focused conservation action at the landscape scale include birds of prey. The recent population crash of *Gyps* vultures in the Indian Subcontinent resulted in their global threat status being revised from near threatened to Critically Endangered. Two species, slender-billed vulture (*Gyps tenuirostris)* and white-backed vulture (*G. bengalensis)*, occur in the region, and their populations in the plains of northeastern Cambodia are now of the highest conservation significance, as the decline in these populations does not appear to be linked to the precipitous decline of populations in the Indian Subcontinent (BirdLife International 2001, Pain *et al*. 2003).

The Endangered Bengal florican (*Houbaropsis bengalensis)* is a flagship for diminishing grassland ecosystems in Cambodia and Vietnam. The majority of the known global population breeds in the inundation zone of Tonle Sap Lake, dispersing to surrounding areas in the wet season (Goes 2000, BirdLife International 2001). This area contains the largest remnant tracts of semi-natural floodplain grassland in the region.

Another Endangered bird species requiring species-focused conservation action is white-eared night-heron (*Gorsachius magnificus)*. The global range of this species is restricted to southern China and northern Vietnam, although it extends outside of Indochina. There are very few recent records of this species, and vastly improved information is required to better understand its distribution, status and ecology and to formulate appropriate conservation action.

Galliforms are another group of birds that feature prominently in the IUCN Red List: four species occurring in Indochina are Endangered, and a further seven are Vulnerable (IUCN 2002a). These include six species endemic to the region: Hainan partridge (*Arborophila ardens)*, chestnut-headed partridge (*A. cambodiana)*, orange-necked partridge (*A. davidi)*, Edwards's pheasant (*Lophura edwardsi)*, Vietnamese pheasant (*L.*

hatinhensis), and Germain's peacock pheasant (*Polyplectron germaini)* (Stattersfield *et al*. 1998). The galliform species that is apparently undergoing the most significant decline in Indochina is green peafowl (*Pavo muticus),* which once occurred almost throughout the region but has been eradicated from many areas as a result of overexploitation (BirdLife International 2001); perhaps the most viable population remaining is in the dry forest landscapes of northern and northeastern Cambodia, and contiguous areas of Lao P.D.R. and Vietnam (Tordoff *et al.* 2004a).

Threatened forest passerines fall into two discrete categories: lowland species and montane species. Lowland forest specialists are chiefly distributed in the evergreen forests of peninsular Thailand, close to the region's terrestrial southern boundary, delineated by the sharp transition from seasonal to aseasonal wet climates, where the Sundaic biogeographic influence in the region is at its strongest (Hughes *et al*. 2003). The Critically Endangered Gurney's pitta (*Pitta gurneyi)* is the best known of these, although the best prospects for its survival may now lay outside of Indochina, in the lowland forests of Tanintharyi division, Myanmar (Anon. 2003).

Globally threatened montane passerines include collared laughingthrush (*Garrulax yersini)* and grey-crowned crocias (*Crocias langbianis),* which are endemic to the southern Annamite Mountains of Vietnam, and golden-winged laughingthrush, chestnut-eared laughingthrush and black-crowned barwing, which are endemic to the central Annamite Mountains of Lao P.D.R. and Vietnam (BirdLife International 2001). All globally threatened montane passerines are restricted to montane evergreen forest ecosystems that are threatened by habitat loss and fragmentation. The extremely restricted ranges of some of these species compound these threats.

Reptiles

Siamese crocodile (*Crocodylus siamensis)* was formerly widespread in the Mekong, Chao Phraya and Mae Klong Basins. It is now Critically Endangered and restricted to a few, widely scattered, localities. Although it is abundant in captivity, where it is farmed for its hide, it has been extensively hybridized with other crocodile species, severely limiting the potential of most captive populations for reintroduction programs. Escapes from captivity occur, and the few remnant wild populations require careful management to ensure genetic purity (van Dijk et al. 1999). The Endangered false gharial (*Tomistoma schlegelii)* formerly occurred in extreme southern Thailand but its continued occurrence in the region is not confirmed.

The region supports the most diverse non-marine turtle fauna in the world. In 1999, a re-evaluation of the global threat status of Asia's turtles concluded that 75 percent were globally threatened, with over 50 percent meeting the criteria for Endangered or Critically Endangered. The distributions and habitat requirements of most species in Indochina remain less than perfectly understood, as many recent records stem from wildlife markets (van Dijk *et al*. 2000, Stuart *et al*. 2001, Stuart and Thorbjarnson in press). However, overexploitation to supply the wildlife trade is clearly the major factor driving the decline of most turtle species in the region, with some species fetching several thousand U.S. dollars for a single animal. Given the naturally slow reproductive rates of

many turtle species, many wild populations may not be able to recover from overexploitation on this scale, and conservation action is urgently needed to prevent a wave of extinctions through the region's turtles.

No snake or lizard species in Indochina is currently assessed as globally threatened. However, the IUCN Species Survival Commission recently initiated a global reptile assessment. Reptiles make up a significant proportion of traded wildlife entering China from Cambodia, Lao P.D.R., and Vietnam, and a number of snake and lizard species with a high value in trade may qualify as globally threatened. Also of great concern are species with highly restricted ranges, such as Chinese crocodile lizard *(Shinisaurus crocodilurus)*, a large lizard species known only from a few sites in southern China and northern Vietnam. The conservation of most globally threatened reptile species requires strategic, coordinated regional and global initiatives to combat the over-riding threat to their populations: overexploitation for trade.

Amphibians

In *The 1996 IUCN Red List of Threatened Animals* (IUCN 1996), only a single amphibian species in Indochina was assessed as globally threatened. Following the Global Amphibian Assessment (IUCN-SSC and CI-CABS 2003), however, this total had increased to 46. Many amphibian species are considered highly threatened by habitat loss due to their highly restricted ranges, such as the Critically Endangered speckle-bellied metacarpal-tubercled toad (*Leptolalax ventripunctatus)* only known from Mengla county, Yunnan province and the Endangered Hoang Lien moustache toad (*Vibrissaphora echinata)* only known from the Hoang Lien Mountains of Vietnam. Other species with highly restricted ranges include Hainan knobby newt (*Tylototriton hainanensis)*, Hainan stream frog (*Buergaria oxycephala)*, Hainan torrent frog (*Amolops hainanensis)* (all three of which are restricted to forested streams on Hainan Island), Yunnan Asian frog (*Chaparana unculuanus)* endemic to Yunnan, Vietnamese salamander (*Paramesotriton deloustali)* endemic to northern Vietnam, and Guangxi warty newt *(P. guangxiensis)* endemic to southern China and northern Vietnam. Several large-bodied stream frogs, such as Yunnan spiny frog *(Paa yunnanensis)*, are assessed as Endangered because they are harvested in vast quantities for food. Improved taxonomic knowledge may reveal that some localized taxa that are included in widespread "species" should be treated as full species and that some of them qualify as being globally threatened.

While the need for conservation action for amphibians is becoming increasingly apparent, there is insufficient information to allow appropriate action to be taken. Even the most obvious action, habitat protection, is hampered by a lack of information on distribution of key sites for most species. In addition, inferring from other regions of the world, key threats to globally threatened amphibians may differ significantly from other vertebrate groups for which more information is available, and include pollution and climate change (Blaustein and Wake 1990, Dunson and Wyman 1992, Pounds and Crump 1994). At this stage, amphibian conservation efforts might best be focused on centers of endemism, such as the Huanglianshan/Hoang Lien Mountains.

Fish

Giant catfish (*Pangasianodon gigas)* is perhaps the best-known, globally threatened fish in Indochina. The species is restricted to large, lowland rivers, such as the Mekong, and, as very few are now recorded, it is feared that overfishing and continuing transboundary development of the Mekong River will soon drive it to extinction (Baltzer *et al*. 2001). Giant catfish is, however, just one of a suite of giant freshwater fish that are threatened by overexploitation and, potentially, infrastructure developments that may disrupt their migratory patterns. Other globally threatened giant freshwater fish in the region include Mekong freshwater stingray (*Dasyatis laosensis)*, giant freshwater stingray (*Himantura chaophraya)*, freshwater sawfish (*Pristis microdon)*, and Jullien's golden carp (*Probarbus jullieni)*. Most of these species are migratory, and require the maintenance of intact, large-scale aquatic systems.

A shortage of available data, combined with a lack of emphasis on conducting the assessments, has left the global threat status of the vast majority of the region's fish species unassessed. Incidental observations suggest very depleted and fragmented populations, particularly among lowland species, which are affected by intensive agriculture, pollution and problems of urbanization, notably channelization (Dudgeon 2002a,b), while upland populations are impacted by dam construction and destructive fishing practices, such as electrofishing, poisoning, and dynamiting (Roberts 1995, KFBG 2002, Chen 2003). Thus, there is an urgent need for conservation assessment of fish species, beginning with groups that are relatively well known taxonomically. Smaller-bodied, less commercially valuable species, especially those occurring outside of the Mekong mainstream, are particularly in need of re-assessment in respect to their global threat status (R. Shore *in litt.* 2002), for example the fish *Hemigrammocypris lini*, which is known only from Hong Kong, where it has not been recorded since the 1980s (Fellowes *et al.* 2002).

Plants

There are 248 globally threatened plant species in Indochina, comprising nearly half of the region's globally threatened species. However, this figure probably represents only a fraction of the plant species of global conservation concern in the region, as comprehensive global threat assessments have only been conducted for certain groups. Gymnosperms are generally better assessed than angiosperms. Within angiosperms, tree species and particularly commercially valuable timber species are generally better assessed than other groups. A number of angiosperm families that are known to contain large numbers of endemic species, with very restricted ranges, and high levels of threat from habitat loss and/or overexploitation do not contain any globally threatened species, most notably the Orchidaceae. Comprehensive global threat assessments are a priority for these groups, as they are for pteridophytes and non-vascular plants.

Of the plant species already assessed as globally threatened, the majority are high value timber species threatened by overexploitation. The family with the highest number of globally threatened species is the Dipterocarpaceae, which includes three threatened species of *Anisoptera*, 12 species of *Dipterocarpus*, 20 species of *Hopea*, two species of *Parashorea*, 14 species of *Shorea*, and seven species of *Vatica*. Other globally threatened

plant species in the region include four species of *Aquilaria*, which are threatened by overexploitation of agarwood, an aromatic non-timber forest product.

CONSERVATION OUTCOMES

Biological diversity cannot be saved by *ad hoc* actions (Pressey 1994). In order to support the delivery of coordinated conservation action, CEPF is investing effort in defining conservation outcomes: the quantifiable set of species, sites, and corridors that must be conserved to maximize the long-term persistence of global biodiversity. By presenting quantitative and justifiable targets against which the success of investments can be measured, conservation outcomes allow the limited resources available for conservation to be targeted more effectively, and their impacts to be monitored at the global scale. Therefore, conservation outcomes form the basis for identifying biological priorities for CEPF investment in Indochina.

Biodiversity is not measured in any single unit but, rather, is distributed across a hierarchical continuum of ecological scales (Wilson 1992). This continuum can be condensed into three levels: species, sites and corridors (inter-connected landscapes of sites). These three levels interlock geographically, through the occurrence of species at sites and of species and sites in corridors, but are nonetheless identifiable. Given threats to biodiversity at each of the three levels, quantifiable targets for conservation can be set in terms of Extinctions Avoided (species outcomes), Areas Protected (site outcomes), and Corridors Created (corridor outcomes).

Conservation outcomes are defined sequentially, with species outcomes defined first, then site outcomes and, finally, corridor outcomes. Since species outcomes are extinctions avoided at the global level, they relate to globally threatened species (in the IUCN categories Critically Endangered, Endangered, and Vulnerable). This definition excludes data deficient species, which are considered to be priorities for further research but not necessarily for conservation action *per se*, as well as species threatened locally but not globally threatened, which are considered to be national or regional conservation priorities but not high global priorities. Species outcomes are met when a species' global threat status improves or, ideally, when it is removed from the Red List.

Because of the CEPF focus on global biodiversity hotspots, it is crucial that the process used to derive conservation targets for CEPF is based on a global standard. The principal basis for defining species outcomes for this document is the global threat assessments contained within *The 2002 IUCN Red List of Threatened Species* (IUCN 2002a), which represented the best available data source on the global conservation status of species at the time the expert roundtables were held in 2003. For amphibians, the results of the Global Amphibian Assessment (IUCN-SSC and CI-CABS 2003), which has completed threat assessments and prepared distribution maps for most Old World amphibian species, are used. Furthermore, for certain bird species, recent re-assessments of their global threat status contained within *Globally Threatened Bird Updates* (BirdLife International 2003b) are used. Local experts review draft lists of globally threatened species based on these sources to confirm which species occur in the region of analysis.

Given that many species are best conserved through the protection of a network of sites at which they occur, the next stage is to define a set of "key biodiversity areas," important for the conservation of species, which form the basis for species outcomes. The most important criterion for defining key biodiversity areas is the regular occurrence of significant numbers of one or more globally threatened species. The major challenge here is to determine whether a given threatened species recorded at a given site regularly occurs in significant numbers. In most cases, in the absence of detailed data on population size and minimum area requirements, it is necessary to make a provisional assessment, based on a consideration of the ecological requirements, density and home-range size of the species in question, and the availability of suitable habitat at the site.

In addition to the occurrence of globally threatened species, key biodiversity areas are also defined on the basis of the occurrence of restricted-range species and congregatory species. Sites regularly supporting significant populations of restricted-range species are global conservation priorities, because there are few or no other sites in the world for which conservation action for these species can be taken. This criterion is only used to define key biodiversity areas for birds, as this is the only group for which the concept of restricted-range species has been quantitatively defined: species with a global breeding range of less than 50,000 km^2 (Stattersfield *et al.* 1998). Sites supporting a high proportion of the total population of one or more congregatory species at a particular time of year (for example, breeding, wintering, and staging sites for migratory waterbirds) are conservation priorities because these species are particularly susceptible to threats at these sites. Again, this criterion is only used to define key biodiversity areas for birds, as this is the only group for which comprehensive population estimates for congregatory species are available (Wetlands International 2002); a threshold of 1 percent of the Asian biogeographic population is used.

Site outcomes are met when a key biodiversity area is protected, through improved management or expansion of an existing conservation area, or creation of a new conservation area. Improved management of an existing conservation area will involve changing management practices for a key biodiversity area, in order to improve the long-term conservation of species' populations and the ecosystem as a whole. Expansion of an existing conservation area will involve increasing the proportion of a key biodiversity area under conservation management to meet species' area requirements or include other previously excluded species or habitats. Creation of a new conservation area will involve designating all or part of a key biodiversity area as a conservation area, and initiating effective long-term management. Conservation areas are not limited to actual or potential protected areas but also include sites that could potentially be managed for conservation by local communities, private landowners, military units, or other stakeholders.

The starting point for defining key biodiversity areas in Indochina was the Important Bird Area (IBA) networks in each country, identified by BirdLife International and collaborating organizations (Tordoff 2002, Ounekham and Inthapatha 2003, Seng Kim Hout *et al.* 2003, R. Pimathai *in litt.* 2003, S. Chan *in litt.* 2003). As the IBA networks included most key sites for the conservation of globally threatened, restricted-range and congregatory bird species, it was only necessary to supplement them through the

definition of additional key biodiversity areas for other taxonomic groups. This was done through consultation with local experts in each country, complemented by literature review.

While the protection of a network of sites would probably be sufficient to conserve most elements of biodiversity in the medium term, the long-term conservation of all elements of biodiversity requires the protection of inter-connected landscapes of sites or conservation corridors. This is particularly important for the conservation of broad-scale ecological and evolutionary processes (Schwartz 1999), and also for the conservation of species with wide home ranges, low natural densities, migratory behavior or other characteristics that make them unlikely to be conserved by site-based interventions alone. Such species are termed landscape species (Sanderson *et al.* 2001). In addition, conservation corridors can support the integration of habitat management consistent with conservation objectives (ranging from strict protection to sustainable use) into local, regional, and national land-use planning processes. Consequently, corridor outcomes are defined, based on conservation corridors, in addition to site and species outcomes.

Corridor outcomes are met when a conservation corridor maintains intact biotic assemblages and natural processes. Maintaining intact biotic assemblages requires the maintenance of intact ecological communities, a prerequisite for which is the conservation of landscape species. Maintaining natural processes involves achieving the long-term sustainability of intact ecological and evolutionary processes that are species-driven and essential for the long-term viability of natural ecosystems.

In order to allow the persistence of biodiversity, inter-connected landscapes of sites must be anchored on core areas, embedded in a matrix of natural and/or anthropogenic habitats (Soulé and Terborgh 1999). Therefore, conservation corridors are anchored on key biodiversity areas (core areas), with the rest of the conservation corridor comprising either areas that have the potential to become key biodiversity areas in their own right (through management or restoration) or areas that contribute to the ability of the conservation corridor to support all elements of biodiversity in the long term.

Therefore, key biodiversity areas are the starting point for defining conservation corridors. First, conservation corridors are defined wherever it is considered necessary that connectivity be maintained between two or more key biodiversity areas in order to meet the long-term conservation needs of landscape species. Then, additional conservation corridors are defined wherever it is considered necessary to increase the area of actual or potential natural habitat in order to maintain evolutionary and ecological processes. In the latter case, the definition of conservation corridors is largely subjective, due to limitations of time, lack of relevant data, and absence of detailed criteria. Given these limitations, emphasis is placed on maintaining continuums of natural habitat across environmental gradients, particularly altitudinal gradients, in order to maintain such ecological processes as altitudinal migration of bird species, and to provide a safeguard against the potential impacts of climate change.

Conservation corridors are defined through consultation with local experts, complemented by analysis of spatial data on land cover, elevation and human population distribution, and consideration of the results of previous landscape-scale conservation planning exercises. In Indochina, the results of an ecoregion-based conservation assessment conducted in Cambodia, Lao P.D.R. and Vietnam by WWF (Baltzer *et al.* 2001) and an analysis of forest complexes in Thailand conducted by the Royal Forest Department (1999) were the key sources of information for defining conservation corridors. Because natural habitats are more fragmented in Indochina than in many other regions, the average conservation corridor size was relatively small. One consequence of this was that a relatively large number of conservation corridors were defined, with the benefit that CEPF funding could be more precisely targeted geographically.

In theory, within any given region, or, ultimately, for the whole world, conservation outcomes can be defined for all taxonomic groups. However, this is dependent upon the availability of data on the global threat status of all taxa, and on the distribution of globally threatened species among sites and across corridors. In Indochina, because these data were only available for mammals, birds, amphibians, and, to a lesser degree, reptiles, fish, and plants, conservation outcomes were only defined for these groups.

The approach of using global threat assessments as the basis for defining species outcomes, and, consequently, site and corridor outcomes, has a number of limitations, the most serious being that these assessments are incomplete for many taxonomic groups. However, taxonomic groups for which comprehensive global threat assessments have been completed, particularly birds, have been shown to be effective indicators of biodiversity in general, especially when used to define networks of priority sites for conservation (Howard *et al.* 1998, Burgess *et al.* 2002). Furthermore, the definition of conservation outcomes is an adaptive process: As more species are assessed as globally threatened, additional conservation outcomes can be defined.

Species Outcomes

A total of 492 globally threatened species occur in Indochina, comprising 60 mammal species, 73 bird species, 33 reptile species, 46 amphibian species, 32 fish species and 248 plant species (Table 1 and Appendix 1). To date, global threat assessments have not been conducted for any invertebrate species that occurs in the region, although this should not be taken as an indication that the group is a low conservation priority. Certain invertebrate groups, for instance several cave-dwelling taxa, are characterized by high levels of endemism but also high levels of threat; although huge gaps remain, there have been great increases in knowledge on such species during recent years (Deharveng 2002). Also for many vertebrate and plant groups, global threat assessments are far from comprehensive. For example, global threat assessments have not been conducted for any member of the Orchidaceae family, a group of plants widely recognized to be facing high levels of threat from habitat loss and overexploitation. In Indochina, therefore, comprehensive global threat assessments are a priority for invertebrates, fish, plants, and reptiles other than turtles.

Of the 492 globally threatened species in Indochina, 265 (equivalent to 54 percent of the total) occur in Vietnam, including 70 that are not found elsewhere in the region, 235 (48 percent) occur in southern China, including 122 that are not found elsewhere in the region, 204 (41 percent) occur in Thailand, including 77 that are not found elsewhere in the region, 104 (21 percent) occur in Cambodia, including two that are not found elsewhere in the region, and 102 (21 percent) occur in Lao P.D.R., including one that is not found elsewhere in the region. Although Cambodia and Lao P.D.R. support very few globally threatened species not found elsewhere in the region, they should still be considered high priorities for CEPF investment because they support some of the largest extant habitat tracts in the region, and, consequently, for many species, support the most viable populations and/or represent the greatest opportunity for conservation success.

Table 1. Summary of Globally Threatened Species in Indochina

Taxonomic Group	Global Threat Status				Distribution by Country				
	Critically Endangered	Endangered	Vulnerable	Total	Cambodia	Lao P.D.R.	S. China	Thailand	Vietnam
Mammals	10	18	32	60	26	32	32	34	42
Birds	8	16	49	73	24	22	30	45	40
Reptiles	9	16	8	33	11	13	16	18	22
Amphibians	1	8	37	46	2	4	26	6	23
Fish	3	9	20	32	9	10	15	18	7
Plants	51	64	133	248	32	21	116	83	131
Total	**82**	**131**	**279**	**492**	**104**	**102**	**235**	**204**	**265**

Eighty-two of the globally threatened species in Indochina are Critically Endangered, 131 are Endangered and 279 are Vulnerable. The 10 Critically Endangered mammal species in the region include three primate species: Tonkin snub-nosed monkey, Delacour's leaf monkey and white-headed leaf monkey. The former two species are endemic to Vietnam and the latter is endemic to Vietnam and southern China. All three are among the most threatened primate species in the world, with global populations under 500 individuals (Nadler *et al.* 2003). The Critically Endangered mammal species also include three large mammals: lesser one-horned rhinoceros, hairy rhinoceros and kouprey. Within the region, lesser one-horned rhinoceros is only known to persist at a single site in Vietnam (Polet *et al.* 1999) and hairy rhinoceros is only known to persist at a single site in Thailand, while the continued occurrence of kouprey is unconfirmed. In addition, two bat species in the region are Critically Endangered: Vietnam leaf-nosed bat *(Paracoelops megalotis)* and Wroughton's free-tailed bat (*Otomops wroughtoni)*. Within the region, the latter species is known only from a single site in Cambodia (Walston and Bates 2001), while there are no recent records of the former species, which is endemic to the region

(Corbet and Hill 1992). Critically Endangered mammal species also include small-toothed mole (*Euroscaptor parvidens)* and Chapa pygmy doormouse (*Typhlomys chapensis)*, both of which are believed to be endemic to Vietnam, although there have been no confirmed records of either species since the first half of the 20th century (Corbet and Hill 1992, Lunde and Nguyen Truong Son 2001).

The eight Critically Endangered bird species in Indochina comprise: Gurney's pitta, a species endemic to peninsular Thailand and Myanmar which is highly threatened by clearance of its lowland forest habitat; giant ibis and white-shouldered ibis, the former being endemic to the region and the latter being only otherwise known from a small population on Borneo; and white-rumped vulture and slender-billed vulture, whose Indochinese populations are of increasing significance as they do not appear to have been affected by the factor responsible for the precipitous declines undergone by the Indian Subcontinent populations over the last decade (Pain *et al.* 2003); Christmas Island frigatebird (*Fregata andrewsi)*, which occurs in significant numbers as a non-breeding visitor to coastal areas in the region, chiefly the west coast of peninsular Thailand; Chinese crested tern (*Sterna bernsteini)*, for which there is only one confirmed record from the region; and white-eyed river martin, one of the most enigmatic bird species in the world, of which there have been no confirmed records in the last 25 years (BirdLife International 2001).

The nine Critically Endangered reptile species comprise Siamese crocodile and eight species of turtle: mangrove terrapin (*Batagur baska)*, painted terrapin (*Callagur borneoensis)*, striped narrow-headed softshell turtle (*Chitra chitra)*, Indochinese box turtle *(Cuora galbinifrons)*, Chinese three-striped box turtle *(C. trifasciata)*, Zhou's box turtle, Vietnamese pond turtle (*Mauremys annamensis)* and East Asian giant softshell turtle (*Rafetus swinhoei)*. The fact that so many species of turtle in the region are assessed as globally Critically Endangered is a strong indication of the extreme levels of threat faced by turtles as a group, particularly from overexploitation.

Only one amphibian species in Indochina is currently listed as Critically Endangered: speckle-bellied metacarpal-tubercled toad, which is endemic to Yunnan province in southern China. In addition, only three[1] fish species in Indochina are currently listed as Critically Endangered: dwarf botia (*Botia sidthimunki)*, leaping barb (*Chela caeruleostigmata)* and freshwater sawfish. Considerably more information on fish species status and distribution is necessary before a more comprehensive global threat assessment can be made for the group. It is probable that the region supports many more fish species of the highest global conservation concern.

Finally, 51 Critically Endangered plant species are known to occur in Indochina. Thirty-four of these are members of the Dipterocarpaceae family, including 13 species of *Hopea*, eight species of *Dipterocarpus*, eight species of *Shorea* and three species of *Vatica*. All of these species are high-value timber trees, severely threatened by overexploitation, as are most of the other Critically Endangered plant species in the

[1] A fourth species, Giant catfish *Pangasianodon gigas*, has been recently upgraded from Endangered to Critically Endangered (IUCN 2004).

region. Also included among the Critically Endangered plant species are three conifers in the Pinaceae family, *Abies yuanbaoshanensis*, *A. ziyuanensis* and *Pinus squamata*, all of which are endemic to southern China, and threatened by habitat loss and overexploitation.

Site Outcomes

A total of 362 key biodiversity areas were defined in Indochina (Appendix 2 and Figures 2a-2e). Of these, 215 sites (equivalent to 59 percent of the total) were defined for globally threatened mammal species, 229 (63 percent) were defined for globally threatened, restricted-range or congregatory bird species, 100 (28 percent) were defined for globally threatened reptile species, 42 (12 percent) were defined for globally threatened amphibian species, 16 (4 percent) were defined for globally threatened fish species, and 169 (47 percent) were defined for globally threatened plant species (Table 2).

The number of key biodiversity areas defined for globally threatened plant species would likely be considerably higher if more detailed information was available on the distribution of plant species among sites. Similarly, the number of key biodiversity areas defined for globally threatened fish species would undoubtedly be significantly higher if detailed data were available on the distribution of fish species among sites, and a comprehensive global threat assessment reflecting true global conservation priorities within this group had been conducted.

Table 2. Summary of Key Biodiversity Areas in Indochina

Taxonomic Group	Cambodia	Lao P.D.R.	S. China	Thailand	Vietnam	Total
Mammals	18	31	31	60	75	**215**
Birds	39	24	39	62	65	**229**
Reptiles	21	19	16	32	12	**100**
Amphibians	0	1	17	11	13	**42**
Fish	2	4	0	10	0	**16**
Plants	8	8	42	75	36	**169**
All key biodiversity areas	**40**	**38**	**69**	**113**	**102**	**362**

Of the 362 key biodiversity areas in Indochina, only 229 (equivalent to 63 percent of the total) are wholly or partly included within gazetted protected areas. This indicates that, while protected area-based approaches could form an important component of any conservation strategy for the region, there also exists great potential for conservation action at sites outside of formal protected areas. The proportion of key biodiversity areas outside of gazetted protected areas varies significantly among countries, from 65 percent in Vietnam to only 16 percent in Thailand; this indicates that the opportunity for conservation action outside of formal protected areas may be greater in some countries than others.

Several key biodiversity areas are known to support large numbers of globally threatened species. These include Chhep in Cambodia; Nakai-Nam Theun and Xe Pian in Lao P.D.R.; Huanglianshan and Xishuangbanna in southern China; Hala-Bala, Huai Kha Khaeng, and Khao Banthad in Thailand; and Ke Bang, Ngoc Linh, Phong Nha, and Pu Mat in Vietnam, all of which are known to support at least 30 globally threatened species. These sites should not necessarily be considered to be the highest priorities for conservation action in the region though as they may not necessarily be the most important for the conservation of any particular species and other sites that have received less survey effort to date may support similar numbers of globally threatened species.

As the comprehensiveness of available data on the distribution of globally threatened species among key biodiversity areas vary significantly among taxonomic groups, key biodiversity areas identified as being important for the conservation of one taxonomic group may also be important for other groups for which data are not yet available. In addition, there are likely to be other important sites for the conservation of globally threatened species in the region that have not been identified during this process, especially for plants and fish.

Corridor Outcomes

A total of 53 conservation corridors were defined in Indochina (Table 3). The conservation corridors cover a total area of 539,047 km^2, equivalent to 36 percent of the total area of Indochina. They range in size from 1,014 km^2 (Ke Go and Khe Net Lowlands) to 26,430 km^2 (Mu Ko Similan-Phi Phi-Andaman Corridor). The full list of key biodiversity areas within each conservation corridor is presented in Appendix 3.

Many of the conservation corridors were defined for the conservation of landscape species. In Indochina, these species were taken to comprise Asian elephant, Irrawaddy dolphin (*Orcaella brevirostris)*, rufous-necked hornbill (*Aceros nipalensis)*, plain-pouched hornbill (*A. subruficollis)*, great hornbill (*Buceros bicornis)*, rhinoceros hornbill (*B. rhinoceros)*, sandbar-nesting birds, vultures, large waterbirds, black-faced spoonbill, and migratory freshwater fish. For all of these species, conservation of individual sites in isolation is unlikely to meet their long-term conservation needs. Other conservation corridors were defined on the basis of their importance for maintaining ecological and evolutionary processes, including shorebird migration, annual flooding cycles, and altitudinal migration.

The 53 conservation corridors include 295 key biodiversity areas (equivalent to 81 percent of the total). Moreover, the coverage of globally threatened species within the conservation corridors is very good: Of the 375 globally threatened species for which reliable data on their distribution among sites were available, 369 (equivalent to 98 percent of the total) are confirmed to regularly occur in significant numbers in one or more conservation corridor.

Figure 2a. Site and Corridor Outcomes for Cambodia

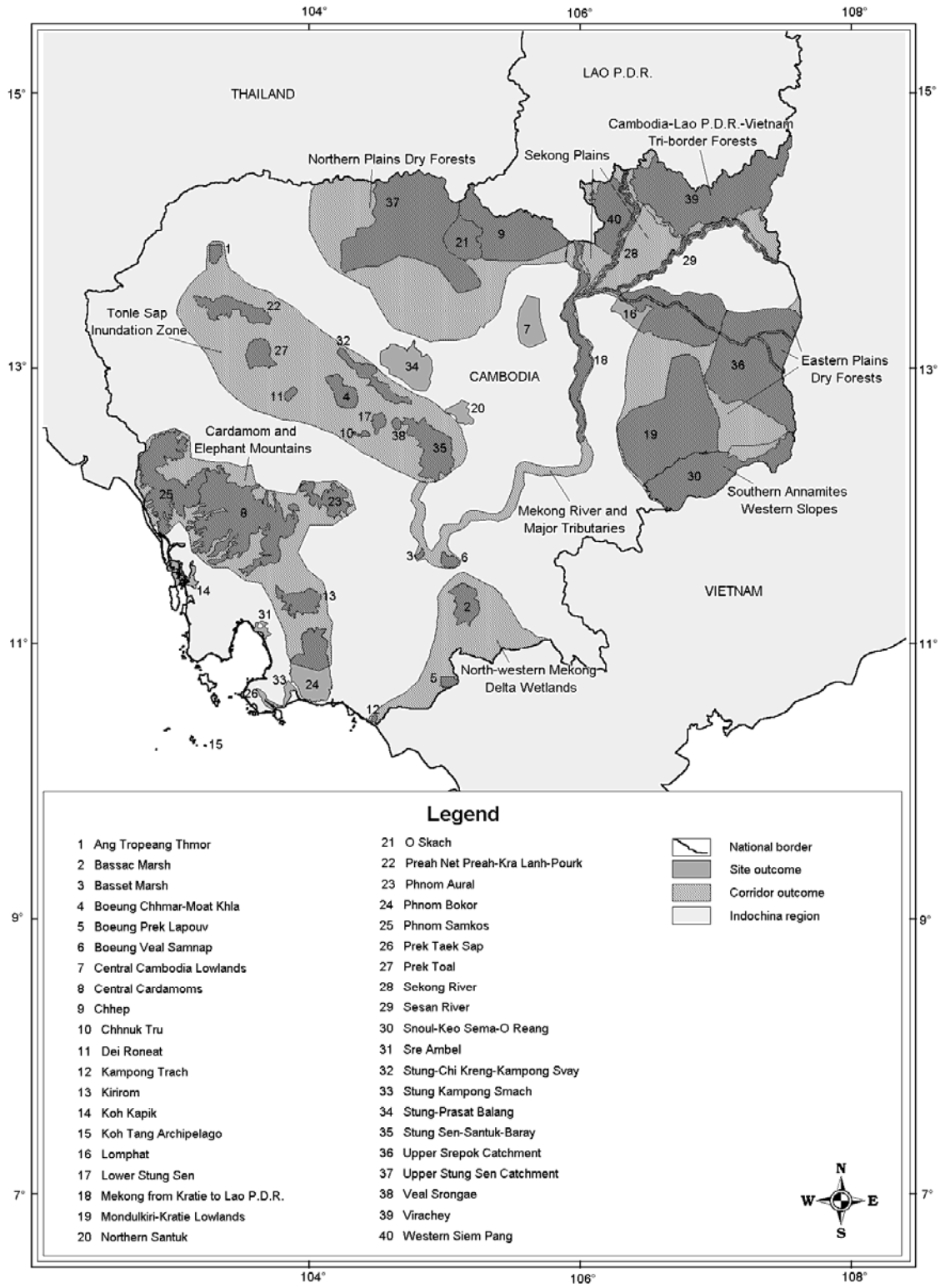


Figure 2b. Site and Corridor Outcomes for Lao P.D.R.

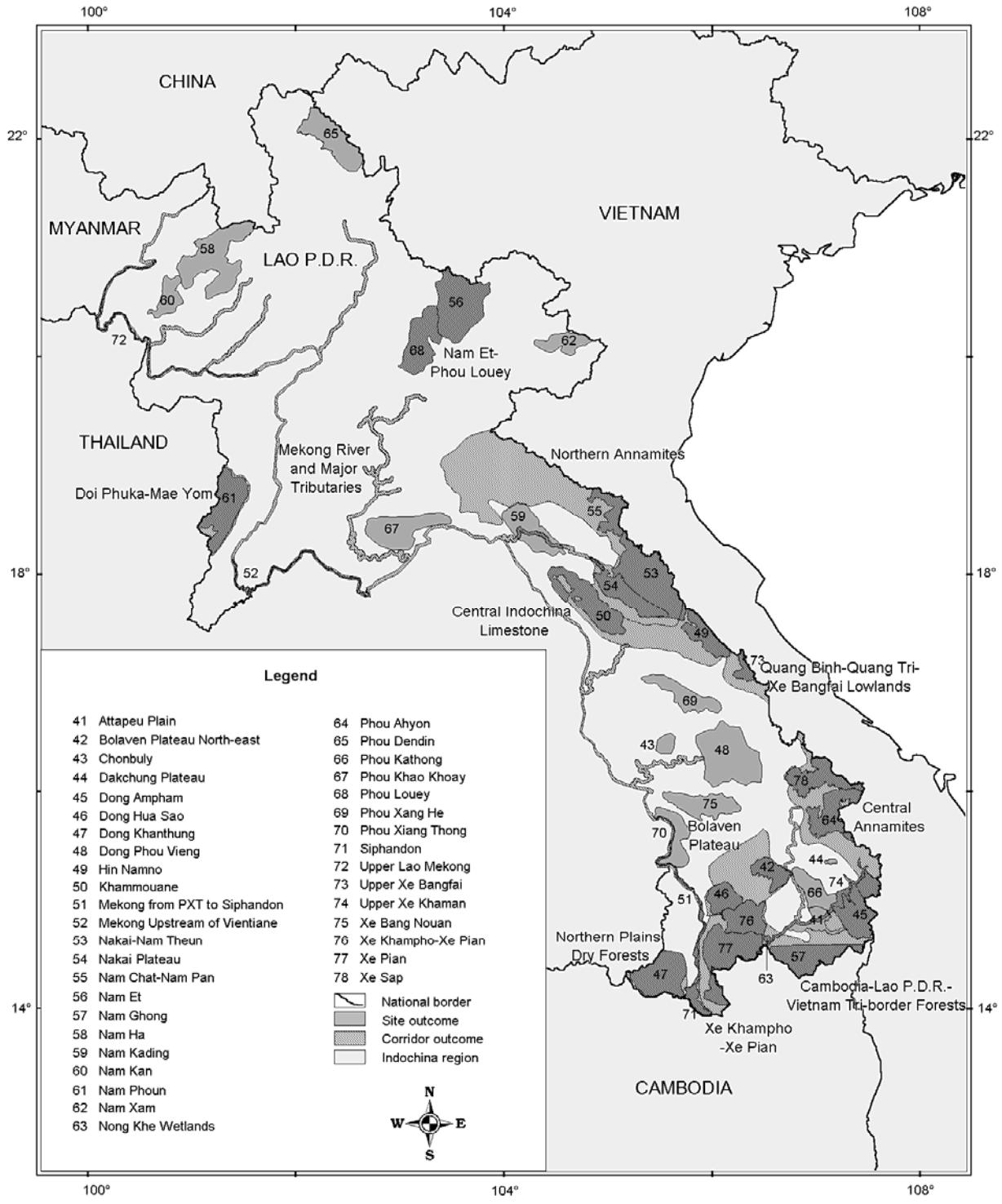


Figure 2c. Site and Corridor Outcomes for Southern China

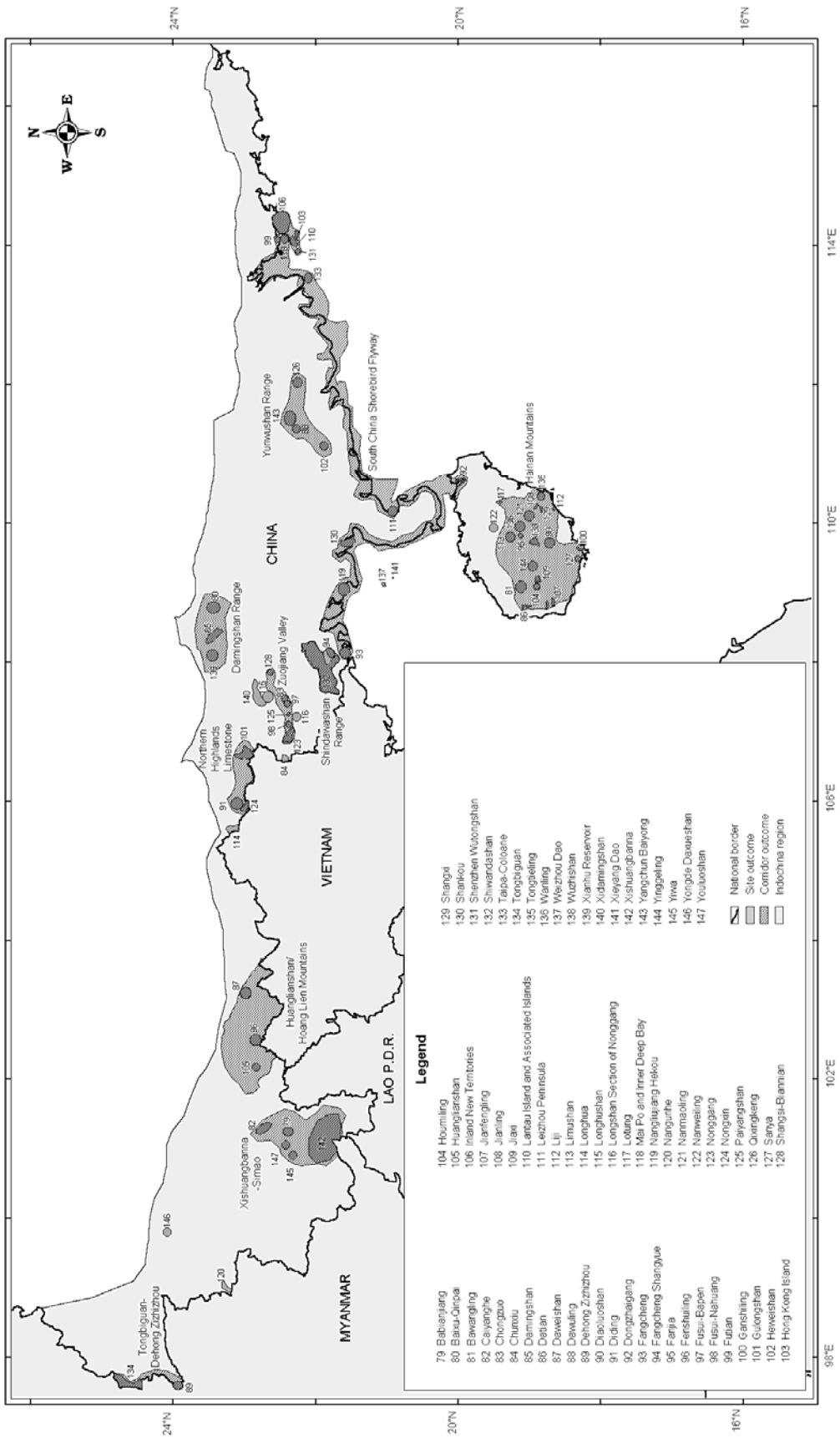


Figure 2d. Site and Corridor Outcomes for Thailand

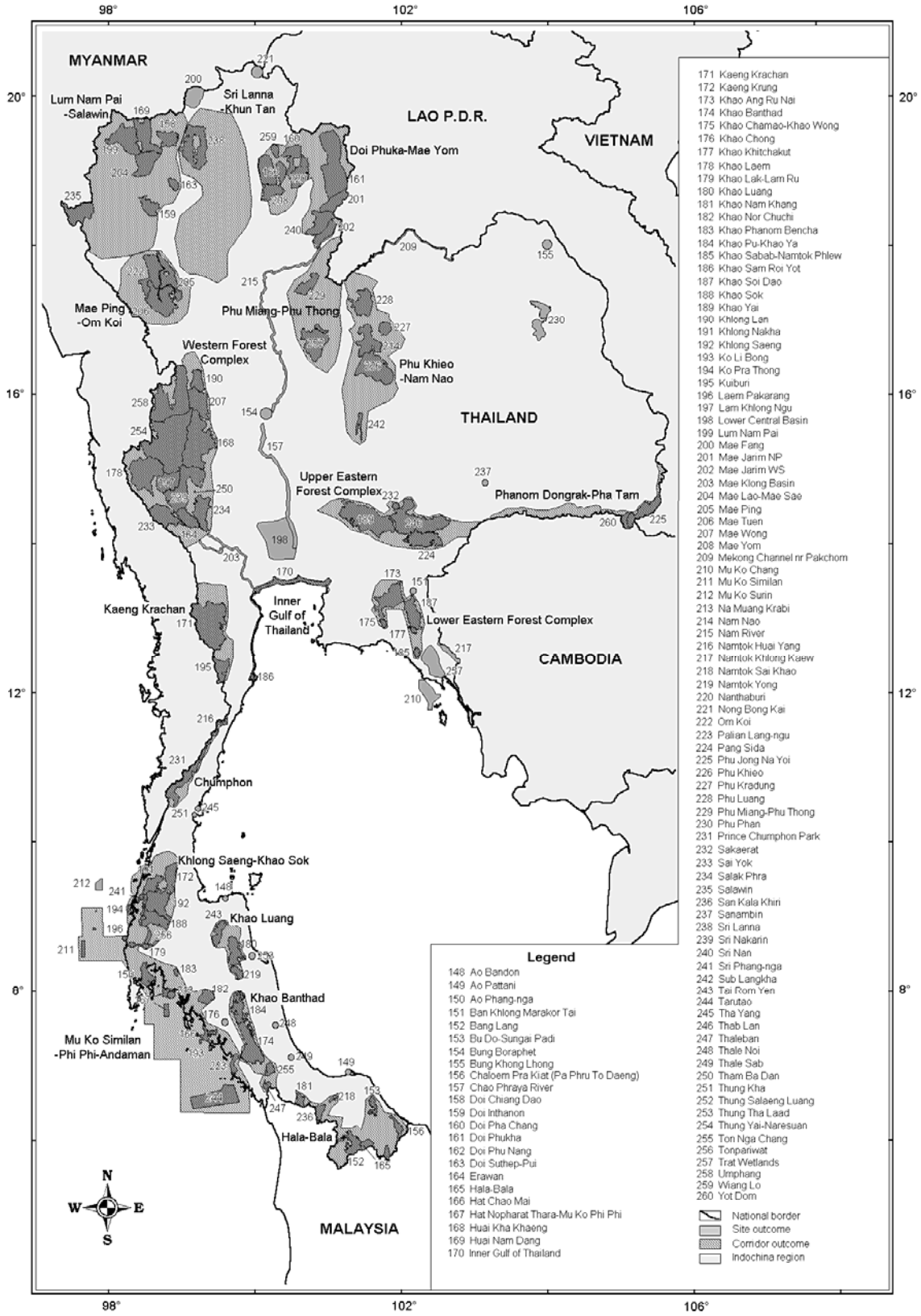


Figure 2e. Site and Corridor Outcomes for Vietnam

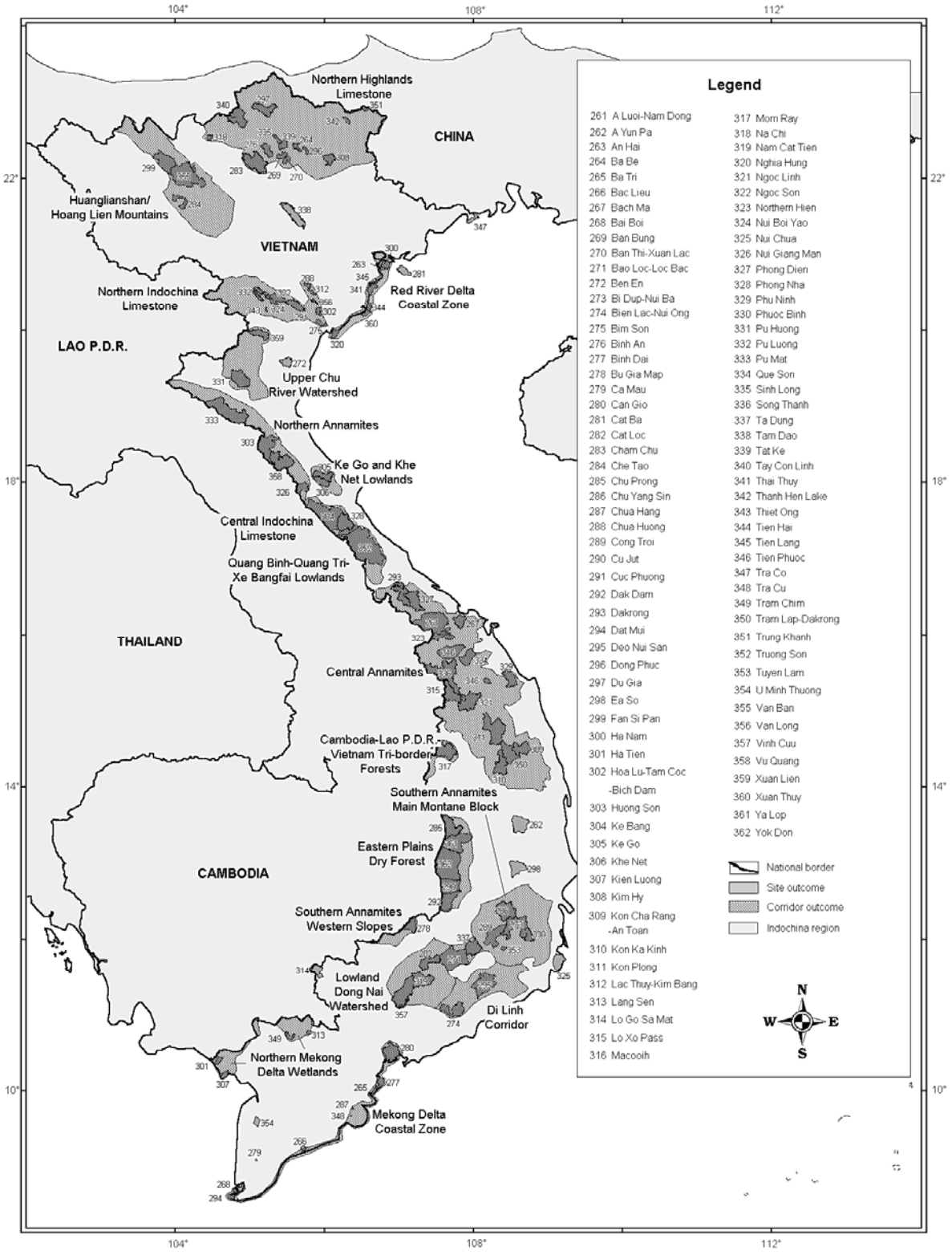


Table 3. Summary of Conservation Corridors in Indochina

Conservation Corridor	Countries	Area (km^2)	# of Key Biodiversity Areas
Bolaven Plateau	Lao P.D.R.	4,428	2
Cambodia-Lao P.D.R.-Vietnam Tri-border Forests	Cambodia, Lao P.D.R. and Vietnam	11,278	4
Cardamom and Elephant Mountains	Cambodia	14,380	5
Central Annamites	Lao P.D.R. and Vietnam	32,951	18
Central Indochina Limestone	Lao P.D.R. and Vietnam	8,017	4
Chumphon	Thailand	1,777	2
Damingshan Range	S. China	4,710	3
Di Linh	Vietnam	5,188	2
Doi Phuka-Mae Yom	Lao P.D.R. and Thailand	17,105	10
Eastern Plains Dry Forests	Cambodia and Vietnam	19,905	8
Hainan Mountains	S. China	16,780	19
Hala-Bala	Thailand	7,387	7
Hong Kong-Shenzhen Mountains	S. China	1,332	3
Huanglianshan/Hoang Lien Mountains	S. China and Vietnam	20,215	6
Inner Gulf of Thailand	Thailand	1,413	2
Kaeng Krachan	Thailand	5,488	2
Ke Go and Khe Net Lowlands	Vietnam	1,014	2
Khao Banthad	Thailand	4,088	4
Khao Luang	Thailand	2,449	3
Khlong Saeng-Khao Sok	Thailand	8,165	8
Lower Eastern Forest Complex	Thailand	4,155	5
Lowland Dong Nai Watershed	Vietnam	8,328	5
Lum Nam Pai-Salawin	Thailand	24,402	7
Mae Ping-Om Koi	Thailand	8,716	3
Mekong Delta Coastal Zone	Vietnam	3,950	8
Mekong River and Major Tributaries	Cambodia, Lao P.D.R., S. China and Thailand	17,070	11
Mu Ko Similan-Phi Phi-Andaman	Thailand	26,430	11
Nam Et-Phou Louey	Lao P.D.R.	4,411	2
North-western Mekong Delta Wetlands	Cambodia and Vietnam	7,865	7
Northern Annamites	Lao P.D.R. and Vietnam	21,220	7
Northern Highlands Limestone	S. China and Vietnam	24,477	17
Northern Indochina Limestone	Vietnam	6,757	10
Northern Plains Dry Forests	Cambodia and Lao P.D.R.	19,460	4
Phanom Dongrak-Pha Tam	Thailand	3,537	2
Phu Khieo-Nam Nao	Thailand	13,430	5
Phu Miang-Phu Thong	Thailand	9,968	2
Quang Binh-Quang Tri-Xe Bangfai Lowlands	Lao P.D.R. and Vietnam	3,823	2
Red River Delta Coastal Zone	Vietnam	2,262	7
Sekong Plains	Cambodia	3,873	1

Conservation Corridor	Countries	Area (km^2)	# of Key Biodiversity Areas
Shiwandashan Range	S. China	2,464	2
South China Shorebird Flyway	S. China	23,720	8
Southern Annamites Main Montane Block	Vietnam	10,220	5
Southern Annamites Western Slopes	Cambodia and Vietnam	3,932	2
Sri Lanna-Khun Tan	Thailand	20,227	1
Tongbiguan-Dehong Zizhizhou	S. China	1,244	2
Tonle Sap Lake and Inundation Zone	Cambodia	17,614	10
Upper Chu River Watershed	Vietnam	4,497	2
Upper Eastern Forest Complex	Thailand	9,730	4
Western Forest Complex	Thailand	24,256	12
Xe Khampho-Xe Pian	Lao P.D.R.	4,786	3
Xishuangbanna-Simao	S. China	8,562	5
Yunwushan Range	S. China	3,851	4
Zuojiang Valley	S. China	1,740	6

SOCIOECONOMIC FEATURES

Introduction and Historical Context

Indochina was one of the first regions where agriculture developed (Solheim 1972 cited in van Dijk *et al*. 1999), creating a long history of forest burning and clearance for shifting and permanent cultivation. Indochina has been home to some of the most successful Asian civilizations, for instance the Angkorian Empire, which dominated the region for several centuries. The 19th and first half of the 20th centuries were characterized by French colonial regimes in Cambodia, Lao P.D.R., and Vietnam, while Thailand and mainland China remained independent; current institutional frameworks in the respective nations reflect this to varying degrees. Another key difference between China, Lao P.D.R. and Vietnam on one hand and Cambodia and Thailand on the other is the existence of communist regimes in the former countries. Cambodia is still recovering from almost three decades of civil war; its governance has most recently been influenced by the presence of the United Nations Transitional Authority in Cambodia (UNTAC) during the 1990s, since when the gradual development of a democratic political system has been underway.

Demographic and Social Trends

Indochina has a human population of around 200 million. Average population densities vary enormously across the region: Lao P.D.R. has just 19 people per km^2 (National Statistics Centre 1997), although population density per unit area of agricultural land is near the regional average. China's Guangdong Province has 400 per km^2 and Hong Kong Special Administrative Region has more than 6,000 per km^2 (Benewick and Donald 1999).

Human populations in the region are predominantly rural. The projected urban population figures in Table 4 show an increasing trend toward urban-based human societies. However, these figures are still among the lowest in the world for the percentage of total population living in urban environments; urban populations in developed countries typically comprise 60 to 80 percent of the total population. Regional population distribution is very uneven. For example, Vietnam's population shows marked concentrations in the Red River (approximately 1,000 people per km^2) and Mekong Deltas (approximately 500 people per km^2), with mountainous parts of the country being much more sparsely populated; southern China shows even more extreme variations. In the mid-1990s, approximately 83 percent of the population in Lao P.D.R. inhabited small villages in rural areas, with the only urban centers being along the Mekong River, with smaller towns on its major tributaries (National Statistics Centre 1997, Duckworth *et al*. 1999). Most protected areas in the region have significant human populations living and/or using resources within their boundaries (e.g. Robichaud *et al*. 2001).

Table 4. Demographic and Social Indicators for the Five Countries in Indochina

Indicator	Units	Period	Country				
			Cambodia	China*	Lao P.D.R.	Thailand	Vietnam
Total population	Millions	2003	13.5	1,300.	5.7	63.1	82
Annual population growth rate	%	1975-2003	2.3	1.2	2.2	1.5	1.9
		2003-15	1.9	0.6	2.1	0.7	1.2
Urban population	as % of total	1975	10.3	17.4	11.1	23.8	18.9
		2003	18.6	38.6	20.7	32	25.8
		2015	26.1	49.5	27.4	36.7	32.4
Adult (age 15+) illiteracy rate	%	2003	26.4	9.1	31.3	7.4	9.7

Source: UNDP (2005). Note: * = figures are for the whole country.

The high proportion of the population living in rural areas and high levels of poverty throughout Indochina mean that natural resources, particularly those of forests, wetlands and grasslands, form a critical component of livelihood strategies for many of the region's inhabitants. Consequently, poverty alleviation and biodiversity conservation are inextricably linked, as both are dependent upon sustainable management of natural resources.

Cambodia's population growth rate of 2.3 percent per year is one of the highest in Asia (UNDP 2005); Lao P.D.R. also has a very high population growth rate. While population growth rates throughout the region are forecast to drop, they will remain relatively high in most countries, at least in the short term. Adult illiteracy is still particularly high in Cambodia and Lao P.D.R. (greater than 25 percent in each country).

Indochina supports an exceptional ethnic diversity, particularly in highland areas. For example, 25 ethnic groups inhabit China's Yunnan Province, 54 ethnic groups are recognized in Vietnam (Dang Nghiem Van *et al.* 1993), and more than 230 languages have been identified in Lao P.D.R. (CARE 1996). Religious faiths are predominantly

Buddhist, with the influence of Christianity in many areas, Islam in southern Thailand, and animism among some ethnic minorities. The effects of globalization are apparent almost everywhere, however, and traditional values and ethnicity appear to be of decreasing importance to younger generations, resulting in a gradual reduction of ethnic diversity through the region. Traditionally, family values and ties throughout the region are very strong and this remains the case today, although they are diminishing in the larger urban centers.

On a Human Development Index that ranks 175 countries in the world on a combined measure of per capita income, literacy and life expectancy, only two countries in Indochina fall within the top 100. Thailand is ranked at 73, China at 85, Vietnam at 108, Cambodia at 130, and Lao P.D.R. at 133 (UNDP 2005).

Economic Trends

Until very recently, all nations had predominantly rural, natural resource/agriculture-based economies. This is essentially still the case in Cambodia and Lao P.D.R., while large parts of Thailand, Vietnam, and southern China have yet to become industrialized. Thailand achieved double-digit economic growth in the late 1980s, marking its gradual shift to an export-driven, industrialized economy (ADB 2000). Over the last decade, the smaller communist states, particularly Vietnam, have begun to gradually shed their centrally planned economic policies for market-oriented policies. China has been doing so for some time already. All countries in the region were affected by the Asian economic crisis and global economic slump in the late 1990s, which, in turn, has exacerbated many environmental problems.

Table 5 illustrates the high levels of poverty throughout the region. The percentages of the populations of Cambodia and Lao P.D.R. without sustainable access to improved water sources are still extremely high, even regionally. Most telling is the percentage of population earning less than $2 per day, which is still above 30 percent even in Thailand, and a startling 63.7 percent in Vietnam, despite the country's rapid economic growth over the past decade (ADB 2000, UNDP 2005).

Table 5 also illustrates the relative poverty within the region and the continued reliance of several countries on Overseas Development Assistance (ODA), although the figures mask huge variations within countries, particularly China. The largest recipients of ODA in the region are Vietnam and China, although the largest per capita recipients are Cambodia and Lao P.D.R., reflecting the small human populations of these countries.

Table 5. Economic Indicators for the Five Countries in Indochina

Indicator	Units	Period	Country				
			Cambodia	China*	Lao P.D.R.	Thailand	Vietnam
Population without sustainable access to improved water source	%	2002	66	23	57	15	23 27
Population below income poverty line	% earning <$1 per day	1990-2003	34.1	16.6	26.3	<2	17.7 ND
	% earning <$2 per day	1990-2003	77.7	46.7	73.2	32.5	63.7 ND
GDP per capita	$	2003	2,078	5,003	1,759	7,595	2,070 2,490
Overseas Development Assistance received	Total ($ millions)	2003	508.0	1,324.6	298.6	–956.3	1,768.6
	$ per capita	2003	37.9	1.0	52.8	–15.6	21.8
	% of GDP	2003	12.0	0.1	14.1	–0.7	4.5

Source: UNDP (2005). Note: * = figures are for the whole country; ND = no data.

Following decades of civil war and political instability, Cambodia is pursuing economic liberalization and has stabilized its exchange rate. Supported by generous donor aid, the country's economy is becoming more market-oriented, although it remains predominantly rural and agriculture-based (clothing also ranks among its chief exports), and thus vulnerable to climatic vagaries. Public investment is still mainly funded by ODA (ADB 2000).

Lao P.D.R. retains an essentially undiversified economy, heavily reliant on natural resources: 90 percent of domestic energy consumption is based on fuelwood. Agriculture and forestry still account for more than 50 percent of gross domestic product (GDP), with wood products the largest export earner, the garment industry the second largest, hydroelectric power generation the third, and other natural resources making significant additional contributions. Until the Asian economic crisis of the late 1990s, when Lao P.D.R. experienced one of the highest inflation rates in the world (up to 180 percent), largely due to its dependence on trade with Thailand, the economy was growing steadily at approximately 7 percent, and undergoing rapid regionalization (UNDP 1998, Duckworth *et al*. 1999, Robichaud *et al*. 2001).

Thailand's per capita income grew nearly fourfold over the last four decades, with a concommitant reduction in the number of people living below the poverty line (to 13 percent of the population). The country's economy is becoming more industrialized, and the population more urbanized, although this has strongly polarized wealth distribution, with 92 percent of poverty recorded in rural areas and 77 percent concentrated in the north and northeast of the country (ADB 2000). Tourism has been a major contributor to growth, far more so than in any of the neighboring countries, although tourism is an increasingly important contributor to the economies of Cambodia and Vietnam.

Vietnam's GDP growth has been rapid during the last decade, and GDP per capita is now $2,490 (UNDP 2005). Vietnam's principal exports are petroleum, rice, marine products, coffee, rubber, coal and clothing (UNDP 1999). All but one of these is agriculture- or

natural resource-based, and Vietnam is expected to be heavily dependent on exploitation of natural resources for some time (The World Bank 1995).

There is a clear trend of growing wealth inequality within each country. Rural populations are typically poor or very poor, and still heavily dependent on natural resources to meet their basic needs. This contrasts increasingly strongly with the main urban centers, where large middle classes are emerging as national economies develop, particularly in China and Thailand. As urban populations grow in number and wealth, the ecological impacts of their consumption patterns tend to grow disproportionately. Thus, while there may be local benefits from reduced dependence on local resources, pressure on natural resources elsewhere can escalate dramatically, particularly as urban middle classes are disconnected from the impacts of their consumption.

Measures of ecological footprint, or human demand on nature, show that, in 2002, consumption in China and Thailand exceeded ecological capacity, with ecological deficits of 0.5 and 0.2 global hectares per capita respectively. In the same year, consumption in Vietnam and Cambodia was marginally below ecological capacity, with ecological remainders of 0.1 and 0.5 global hectares per capita respectively, while Lao P.D.R. had a substantial ecological remainder of 3.7 global hectares per capita (Wackernagel *et al.* 2002). Ecological remainders are largely occupied by the footprints of other countries, through export production, rather than kept in reserve.

A very small but growing sector of society is devoting leisure time to visiting protected areas and other pursuits that reconnect them to the natural environment. Rural populations, however, are generally uninformed on environmental issues, lack incentives to participate in conservation, and are principally concerned with meeting basic needs. This having been said, many rural communities have traditional structures for natural resources management, which can form a basis for successful conservation interventions.

Infrastructure and Regional Development

Although the region's populations are chiefly rural, several major cities exist, most notably Hong Kong, Shenzhen, Nanning, Bangkok, and Ho Chi Minh City. Hong Kong and Bangkok have two of the busiest airports in Asia. With the exception of Thailand and parts of southern China, road and rail networks are relatively undeveloped and generally poorly maintained, apart from a handful of arterial routes. This is partly due to difficult terrain and partly due to lack of financial resources.

Dams are an increasingly common feature of hill and montane landscapes, providing a significant proportion of the region's electricity supply. Rural areas seldom benefit from piped water, and have poor and unreliable electricity supplies, compared with urban areas, unless they are situated along major roads. Government hospitals and clinics, particularly provincial and rural ones, are generally severely under-resourced. In parts of the region, telephone landlines are also frequently unreliable, and mobile phone networks dominate communication in many areas.

Large-scale infrastructure projects are likely to increase significantly in the region with increasing economic prosperity. For example, Vietnam is in the final stages of constructing a second major north-south road link, which bisects several protected areas. However, several more remote natural landscapes of significant size, particularly in Cambodia and Lao P.D.R., are unlikely to be severely affected by infrastructure development in the immediate future, and, as such, have high potential for the long-term maintenance of intact plant and animal communities.

In many countries in the region, internal transmigration is significant and typically involves migration from densely populated lowland regions into more sparsely populated mountainous regions, often with associated displacement of indigenous peoples. Such transmigration is occasionally sponsored by government but is typically spontaneous, in response to actual or perceived economic opportunities in the settlement areas. In the case of Cambodia, the return of people displaced by past conflicts and political instability are major factors. In many areas, transmigration results in conversion of natural habitats for permanent or shifting agriculture, particularly cash crops.

Government Frameworks

Inappropriate legislative frameworks, conflicting policies, overlapping jurisdictions, and lack of communication among different agencies are characteristics of government frameworks in Indochina and represent major obstacles to the effective management of environmental resources. Moreover, government institutions often lack sufficient funding and adequately trained staff to effectively implement their mandates, enforce conservation legislation and fulfill obligations under international conventions. Extremely low average government salaries frequently contribute to low motivation. In addition, turnover of staff in many government departments remains high, with one result being that investments in staff training are diluted. Another key shortcoming is a lack of accurate data with which to make informed management decisions.

All five countries in Indochina have government structures comprising central-level bodies with local administrative bodies at various levels. These structures exhibit varying degrees of decentralization. In China, Lao P.D.R., and Vietnam, local administrative bodies typically have more autonomy than in the more centralized government structures of Cambodia and Thailand. Shortcomings of decentralization include unclear and overlapping responsibilities, and lack of cooperation among local institutions with authority over natural resources, which can particularly impact the effectiveness of protected area management. Given the size and complexity of China and its government structures, achieving effective coordination remains one of the most important and intransigent obstacles to effective biodiversity conservation (Maxey and Lutz 1994). This is also true, to varying degrees, for other countries in the region.

The cornerstone of each government's biodiversity conservation strategy has been the designation of protected areas for the conservation of wildlife and their habitats. Although in some countries, such as Thailand, responsibility for protected area management lies with a single government institution, responsibility for biodiversity conservation is typically shared among several institutions, and division of

responsibilities among them is not always clear. In general, however, management responsibility is more clearly defined for forests than for wetlands. In addition, the institutions responsible for biodiversity conservation are often dependent upon other institutions, such as the police, armed forces, and judiciary, to effectively discharge their responsibilities, and these institutions rarely consider biodiversity conservation to be a high priority.

The following section summarizes government institutional responsibility for biodiversity conservation issues in each country.

Cambodia

The two government institutions responsible for natural resources management are the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the Ministry of Environment (MoE). MoE is chiefly responsible for management of the 23 protected areas designated by Royal Decree in 1993, while MAFF is responsible for management of wildlife resources outside of these protected areas, including law enforcement, research and management of other biodiversity conservation areas. The two ministries share responsibility for the various international conventions and treaties to which Cambodia is party. The two offices specifically assigned to wildlife conservation are the Wildlife Protection Office of the Forest Administration of MAFF, and the Protected Areas Office of the Department of Nature Conservation and Protection (DNCP) of MoE (Seng Kim Hout *et al*. 2003).

China

China's State Council, appointed by the National People's Congress, has ultimate responsibility for the country's environment. The State Council authorizes the State Environmental Protection Administration (SEPA)[2] to coordinate and monitor the management of biodiversity conservation. SEPA's responsibilities include formulating laws, regulations, economic, and technical policies, compiling national programs and technical specifications, formulating management regulations and evaluation standards for nature reserves, and supervising the conservation of rare and threatened species. In addition, SEPA is responsible for the implementation and supervision of international environmental conventions, and represented the government in drafting and revising the CBD. However, responsibility for managing the majority of forests and other protected areas lies with the State Forestry Administration[3]. Several other institutions also have biodiversity conservation responsibilities, including the Ministry of Agriculture, the Ministry of Water Resources and the Chinese Academy of Sciences (CAS). Previously, the State Environmental Protection Committee (SEPC) of the State Council, with representatives from various ministries, played an important coordinating role: examining and approving general principles and policies concerning environmental protection at the national level, and resolving any difficulties through consultations between relevant institutions. Central government restructuring, which led to the abolition of the SEPC in 1998, has been a loss for coordination and adjudication among agencies.

[2] formerly the National Environmental Protection Agency.
[3] formerly the Ministry of Forestry.

One source of independent expert advice to the State Council in policy development and planning is the China Council for International Cooperation on Environment and Development (CCICED), a high-level, nongovernmental consultative forum created in 1992 with the support of a grant from the Canadian Government. CCICED consists of senior Chinese officials and experts, together with high-profile international experts, with a variable number of working groups and task forces.

Lao P.D.R.

The management of most forests in Lao P.D.R., including those designated as protected areas, is the responsibility of the Department of Forestry (DoF) of the Ministry of Agriculture and Forestry. At the central level, the key institution within DoF is the Division of Forest Resource Conservation, which was created in mid-1999 as part of a wide-ranging restructuring of central government, to improve efficiency and move central staff to assist provinces and districts. At local levels, forest management is the responsibility of Provincial and District Agriculture and Forestry Offices. Several other government institutions outside of DoF contribute to environmental management. The main one is the Science, Technology and Environment Agency (STEA) in the Office of the Prime Minister, which is mandated to provide broad inter-sectoral coordination and regulation, for which the adoption of a draft Environmental Protection Law will give it wide statutory powers. STEA is responsible for conducting environmental impact assessments, controlling commercial exploitation of biodiversity, and the implementation of international conventions relating to the environment. Its mandate to regulate research also requires a close relationship with the National Agriculture and Forestry Research Institute. Other institutions, such as the Ministry of Defence, the Hydropower Office of the Ministry of Industry and Handicrafts, and the National Tourism Authority, are also integrally involved in or near protected areas (Robichaud *et al*. 2001).

Thailand

Since 2002, management of the national protected area system has been the responsibility of the National Parks, Wildlife and Plant Conservation Department of the newly established Ministry of Natural Resources and Environment. This department was established from the former Royal Forest Department of the Ministry of Agriculture and Cooperatives. Other bodies with environment-related remits include the Department of Fisheries, the Department of Agriculture, and the National Resources and Biodiversity Institute (NAREBI). NAREBI was established in 1998 to provide more flexibility in natural resources management policies and to reduce institutional overlap and duplication of efforts. The other main government institution involved in natural resources management is the Office of Natural Resources and Environmental Policy and Planning of the Ministry of Natural Resources and Environment, which is responsible for developing and coordinating national and international environmental plans and policies.

A significant recent institutional development in Thailand was the establishment of the Thailand Biodiversity Centre in February 2000. This center is the secretariat of the National Biodiversity Board, functions as a clearinghouse for the CBD and supports research and programs relating to access to and sharing of benefits from biodiversity use.

Vietnam

Responsibility for environmental management is divided among several central government institutions, including the Ministry of Agriculture and Rural Development (MARD), the Ministry of Natural Resources and Environment (MONRE), the Ministry of Fisheries (MoFI), the Ministry of Education and Training, and the Ministry of Planning and Investment. Of these institutions MARD has the main responsibility for forest management, with the Forest Protection Department (FPD) within MARD being responsible for developing the national protected area system and enforcing wildlife protection regulations. MONRE is responsible for international conventions related to the environment, including the CBD and the Ramsar Convention. Within MONRE, the National Environmental Protection Agency is responsible for the development of a system of wetlands of national importance. Conservation of marine biodiversity is principally the responsibility of MoFI, although a number of marine and wetland sites are included in the national protected area system managed by FPD of MARD. In addition, there are a number of government research institutes whose work supports biodiversity conservation and protected areas planning, including the Institute of Ecology and Biological Resources of the National Centre for Science and Technology, and the Forest Inventory and Planning Institute of MARD.

Civil Society Frameworks

Civil society organizations active in biodiversity conservation in Indochina can be broadly grouped into local organizations and international organizations. Local organizations include community-based organizations, national NGOs, academic institutions, private companies, and faith-based organizations. Relative to many other regions of the world, local civil society groups in Indochina have only recently begun to organize to address environmental concerns. There are relatively few national NGOs active in biodiversity conservation, and these are frequently limited in terms of capacity, political leverage, and program development. Community-based organizations are at varying stages of development but, in general, the potential to engage them in biodiversity conservation remains largely untapped. In each country, there are national academic institutions with capacity to undertake applied biodiversity research and, in some cases, on-the-ground conservation action. With a few exceptions, the private sector in the region is generally not engaged in conservation. Faith-based organizations can also play an important role in conservation in the region, through both promoting positive attitudes toward environmental protection and taking on-the-ground action. In the Mekong Delta of Cambodia and Vietnam, for instance, there are a number of examples of Buddhist monks protecting bird and bat colonies within temple grounds. However, the general description above hides significant variation among countries in the region, with respect to the level of development of local civil society and the extent of its engagement in conservation.

International civil society organizations active in the region include international conservation organizations, which mainly comprise NGOs but also include IUCN. These organizations typically have larger programs and greater capacity than local NGOs, and are generally active in more than one country in the region (Table 6). International private sector organizations active in biodiversity conservation in the region include

environmental consulting companies, for example Scott Wilson-Kirkpatrick, which has been contracted to implement two components of a United Nations Development Program (UNDP)/GEF-funded project in Vietnam. Other private sector organizations play a relatively minor role in biodiversity conservation in the region. Where private companies are engaged, it is often indirectly, as donors, for example British Petroleum (BP), which supports a global conservation program as well as a number of local conservation initiatives in China and Vietnam. In addition, a number of academic institutions based outside of the region, particularly in Europe and North America, are also active in Indochina. These include the American Museum of Natural History, the Smithsonian Institution, Missouri Botanical Garden, and the Royal Botanic Garden, Edinburgh. To date, these institutions have largely been involved in research and capacity building, particularly in biodiversity survey and taxonomy.

Table 6. International Conservation Organizations Active in Indochina

Organization	Country				
	Cambodia	China[2]	Lao P.D.R.	Thailand	Vietnam
BirdLife International[1]	+	+	+	+	+
Conservation International	+	+			
Fauna & Flora International	+	+			+
International Crane Foundation	+	+			+
IUCN	+	+	+	+	+
The Nature Conservancy		+			
TRAFFIC	+	+			+
Wetlands International	+	+		+	
WildAid	+			+	
Wildlife Conservation Society	+	+	+	+	
WWF	+	+	+	+	+

Notes: 1 = BirdLife International is active through its network in the region, with a Partner in Thailand (BCST), an Affiliate in Hong Kong (Hong Kong Birdwatching Society) and an Indochina Program covering Cambodia, Lao P.D.R. and Vietnam; 2 = list includes organizations active in China but not currently active in the part of southern China within Indochina.

Cambodia

The development of civil society in Cambodia was interrupted by decades of armed conflict and political instability, which only subsided at the end of the 1990s with the establishment of UNTAC. Beginning in the UNTAC period, there has been a dramatic growth in the number of NGOs and level of donor investment in civil society. Of the large number of local NGOs that have been established in the country, only a small proportion are directly involved in biodiversity conservation, for example Save Cambodia's Wildlife, Mlup Baithong, and the Culture and Environmental Protection Association, although there also exists significant potential to engage local NGOs with a development agenda in biodiversity conservation.

The large sums of donor assistance that have been made available to Cambodia in recent years have also facilitated the development of country programs by a large number of international conservation organizations, including BirdLife International, CI, Fauna &

Flora International (FFI), International Crane Foundation (ICF), TRAFFIC, Wetlands International, Wildlife Conservation Society (WCS) and WWF (Table 6). These organizations are typically better resourced, with higher capacity and larger programs than national NGOs. To date, a large proportion of conservation projects in Cambodia have been implemented by international conservation organizations in collaboration with government counterparts, although there is a growing trend of direct donor assistance to government institutions.

China

Although restrictions exist on the development and operation of civil society organizations in China, there are a significant number of local NGOs and community-based organizations active in environmental protection and natural resources management. These include, for example, the China Energy Conservation Association, the China Environmental Protection Foundation, the China Green Foundation, the China Society for Environment and Science, the China Wildlife Conservation Association, and Friends of Nature. In many cases, these organizations have strong ties to government institutions, and do not have complete freedom of operation. A number of international conservation organizations are active in China, including CI, FFI, ICF, IUCN, The Nature Conservancy, Wetlands International, and WWF (Table 6). To date, however, relatively few of these organizations have had significant active involvement in biodiversity conservation in the parts of Mainland China within Indochina.

Local academic institutions, including research institutions and universities, represent an important sector of civil society in Mainland China. Institutions such as the Kunming Institutes of Zoology and Botany (both of CAS), Yunnan University, Yunnan Forestry Institute, Yunnan Social Science Institute, Zongshan University, and Qinghua University have made significant contributions to biodiversity conservation in Indochina, primarily through research and monitoring, although several institutions are also involved in raising public awareness of biodiversity conservation issues, and their potential in this area is substantial (Maxey and Lutz 1994).

The situation in Hong Kong regarding the development of local civil society is substantially different from that in Mainland China. A number of local conservation NGOs have well-established programs in the territory, including WWF-Hong Kong and the Hong Kong Birdwatching Society. In addition, one notable organization active in biodiversity conservation in Hong Kong is KFBG, which also has a program in those parts of Mainland China within Indochina.

Lao P.D.R.

Within Indochina, Lao P.D.R. has the least amount of civil society engagement in biodiversity conservation. There is no legislative basis for the establishment of NGOs, hence civil society is largely restricted to international conservation organizations. However, for a number of reasons, including recent reduction in funding for conservation projects in Lao P.D.R. by a number of major donors, the number of international conservation organizations active in Lao P.D.R. is lower than that in any other country in the region (Table 6). In addition to international conservation organizations, a number of

international development NGOs active in the natural resources sector are implementing projects that include biodiversity conservation among their objectives, for example Village Focus International.

A number of academic institutions in Lao P.D.R. are beginning to become more actively involved in the implementation of biodiversity conservation projects, for example the National University of Lao P.D.R. As in China and Vietnam, academic institutions in Lao P.D.R. are government institutions and their activities tend to be restricted to areas such as research and environmental awareness.

Thailand

Of the five countries in the region, Thailand has the longest history of local civil society involvement in conservation, dating back to the work of the Natural History Society of Siam to secure legal protection for rhinoceroses in the 1920s and including the efforts of the Association for the Conservation of Wildlife to promote the establishment and expansion of the national protected area system from the 1950s onward (P. P. van Dijk *in litt.* 2003). A defining moment in the development of the local conservation movement in Thailand was the dispute over the proposed construction of the Nam Choan hydropower dam within Thung Yai Naresuan Wildlife Sanctuary in the early 1980s. This proposal met with opposition from a broad-based coalition of civil society, including local communities, students and academics, environmental NGOs and representatives of the private sector. These events are now considered to have given birth to Thailand's "green movement," which has continued to develop and gain momentum since then (Carew-Reid 2002), particularly following the re-establishment of civilian rule in 1992.

Today, local civil society is relatively well developed in Thailand, compared with many other countries in the region. There are a number of local NGOs active in biodiversity conservation, such as the Asian Elephant Foundation of Thailand, the Bird Conservation Society of Thailand (BCST), the Hornbill Research Foundation, the Seub Nakhasthein Foundation, and Wildlife Fund Thailand. Other NGOs are addressing broader environmental agendas, such as air and water quality. The Green World Foundation, for instance, has a program to promote water-quality testing by local communities. Other NGOs are working with local communities on natural resources management and other initiatives with objectives that potentially overlap with those of biodiversity conservation. The capacity of local NGOs is growing in a number of areas, including public awareness, outreach to decisionmakers and engaging local stakeholders in conservation at the grassroots level. In addition, local NGOs are supporting networks of community-based organizations. For example, BCST coordinates the Bird Conservation Network of Thailand, a network of 32 local conservation groups.

While some academic institutions in Thailand face limitations in terms of financial resources, staffing and technical capacity, others have high potential to engage in biodiversity conservation. Students and staff from various academic institutions conduct a significant amount of biodiversity research every year. A number of institutions are taking a more active role in on-the-ground conservation action. The Forestry Faculty of

Kasetsart University, for example, has developed management plans for a number of protected areas in Thailand.

A significant number of international conservation organizations are also active in Thailand. These include IUCN, WCS, Wetlands International, WildAid and WWF (Table 6). Many of these organizations have well-developed programs and are active in a number of areas, including building capacity of protected area managers and enforcement staff, raising awareness, and environmental education.

Vietnam

Government policy in Vietnam is not strongly supportive of local NGO development. While some relatively high-capacity local NGOs are beginning to emerge, for example Education for Nature Vietnam, these are the exception rather than the rule and very few are actively engaged in biodiversity conservation. In the absence of well-developed, local civil society, international conservation organizations have assumed many of the roles performed by local NGOs in other countries, for example building capacity and raising awareness. International conservation organizations with country programs in Vietnam include BirdLife International, FFI, IUCN, TRAFFIC and WWF (Table 6). These organizations have made important contributions to biodiversity conservation in the region to date, by supporting and complementing the work of government institutions.

There also exist in Vietnam a large number of quasi-NGOs, staffed by serving or retired government officers and operating semi-independently from government. A significant number of these organizations are involved in biodiversity conservation. These include, for example, the Centre for Natural Resources and Environmental Studies, which is developing a mechanism for protected area management at Dakrong Nature Reserve in Vietnam. As in many other countries in the region, a number of academic institutions are active in biodiversity conservation, particularly through research, although these organizations are not independent from government.

LEGISLATION AND PROTECTED AREA NETWORKS

Most countries have recently updated, or are in the process of updating, their policies and legislation on forests and the environment. There exists significant variation among countries with regard to the comprehensiveness of environmental legislation and the effectiveness of its enforcement. Moreover, inter-ministerial policy delineation is often ambiguous, especially in relation to the management and exploitation of wetlands (within and outside protected areas).

Although gaps remain in national protected area systems with regard to coverage of species, habitats, and ecosystems (e.g. Wege *et al.* 1999, Robichaud *et al*. 2001), over the past decade, legislation has been passed in each country to increase the area of land with formal protected area status. The Lower Mekong countries (Cambodia, Lao P.D.R., Thailand and Vietnam), collectively, now have more than 13 percent of their area in national systems of protected areas (ICEM 2003). However, with protected areas as their biodiversity conservation mainstays, each government has a long way to go before being able to claim that these networks are doing their job fully. This includes making further

amendments to the appropriate laws and other legal provisions, and better utilization and enforcement of those already in place.

Consequently, the region boasts precious few examples of protected areas that function effectively. Although significant variation exists among countries in the region with regard to effective enforcement of protected area management regulations, the significant variation within the protected area network of each country suggests that there are factors determining effectiveness of enforcement in addition to the commitment of national governments and the appropriateness of national legislation. Other factors determining the effectiveness of enforcement of management regulations include the commitment and capacity of protected area managers, the commitment and will of local authorities, and the prevailing socioeconomic conditions. Civil society can play an important role in strengthening the enforcement of management regulations through site-based interventions, although, at the same time, there is a pressing need to promote greater commitment toward effective enforcement of management regulations among national governments and local authorities. The following section summarizes biodiversity conservation legislation and protected area networks in each country.

Cambodia

A 1993 Royal Decree designated 23 protected areas covering 3,273,200 hectares, which is equivalent to more than 18 percent of the country's total area. These areas comprise seven national parks, 10 wildlife sanctuaries, three protected landscapes and three multiple-use areas. MoE is responsible for their management. Since 1993, the prime minister has also designated three forest conservation areas for biodiversity conservation purposes. MAFF manages these three areas. The majority of protected areas are large (many exceed 1,000 km^2), reflecting the extensive tracts of natural habitat that remain in the country. However, large protected areas with small resource bases present multiple management challenges, and protected area management regulations are rarely enforced effectively.

The coverage of terrestrial forest ecosystems within the Cambodian protected area network is relatively good. However, a recent review of the coverage of IBAs within the protected area network revealed that the Mekong River channel, offshore islands, inundated grasslands of the Mekong and Tonle Sap, and swamp forest of the Mekong and Tonle Sap are significantly under-represented within protected areas providing the strictest legal protection (Seng Kim Hout *et al.* 2003). When multiple-use areas, protected landscapes, Ramsar sites and biosphere reserve transition areas are included, however, only the former two ecosystems are significantly under-represented (Seng Kim Hout *et al.* 2003).

MAFF is responsible for the implementation of the Law on Forest Management, which was revised and passed in August 2002. It includes a chapter on wildlife conservation, which, for the first time, provides a legal framework for national wildlife conservation. A draft Wildlife Protection Law has also been prepared by MAFF but not yet enacted (Seng Kim Hout *et al*. 2003). In addition, a draft Protected Areas Law has been prepared by MoE and forwarded to the Council of Ministers for consideration.

China

Within the part of southern China in Indochina, terrestrial protected areas mapped by MacKinnon *et al*. (1996) totaled 38 in Yunnan, 26 in Guangxi, 15 in Guangdong, 22 in Hong Kong and approximately 50 on Hainan Island. Most were relatively small (under 500 km^2), reflecting the highly fragmented nature of remaining natural habitats. In addition, they represented only approximately 16 percent of the remaining forest cover, which was estimated at approximately 17 percent in 1992 (MacKinnon *et al*. 1996). The protected area system has since been expanded significantly but figures are currently unavailable for the area within Indochina. Nature reserves may be recognized at township, county, provincial, or national levels on the basis of their scientific importance, with higher level generally conferring increases in recognition and budget. Many nature reserves were formerly forest farms. Although management effectiveness varies widely among protected areas in Mainland China, Hong Kong's country parks, mostly established in the early 1970s, have been relatively successful at maintaining populations of plants and animals and enabling forest regeneration, as a combination of affluent local human populations and effective enforcement of wildlife protection regulations has kept incompatible activities under control.

Over the past 10 years, China has promulgated a series of environmental laws and regulations. The main national laws relevant to biodiversity and habitats in southern China are the Regulations on Reproduction and Conservation of Aquatic Resources (1979); the Marine Environment Protection Law (1982); the Forest Law (1984, revised 1998); the Fishery Law (1986); the Law on Protection of Wild Animals (1988); the Environment Protection Law (1979, revised 1989); the Regulations on Conservation of Terrestrial Wild Animals (1992); the Regulation on Forest and Wild Animal Nature Reserves Management (1994-5); and the Regulation on Wild Plant Conservation (1996). Local governments have also issued regulations and directives regarding biodiversity conservation. In addition, Hong Kong and Macau Special Administrative Regions have separate biodiversity conservation legislation.

Lao P.D.R.

Prime Ministerial Decree 164 established the national protected area system in 1993, when 18 protected areas were decreed (Berkmuller *et al*. 1995). Two more were added in 1995-1996, bringing to 20 the number of national protected areas. These protected areas cover 3.3 million hectares or 14 percent of the nation's land area (Southammakoth and Craig 2001). Provincial and district protected areas and conservation forests cover an additional 8.2 percent of the nation's land area. The majority of protected areas are large (greater than 1,000 km^2), and most suffer from a chronic shortage of personnel and resources. In addition, most protected areas have significant human populations living and using resources within their boundaries. Consequently, most are consistent with IUCN Category VI Protected Areas: Managed Resource Protected Areas (Robichaud *et al.* 2001). A recent review of the protected area system identified a number of gaps in the coverage of the network, including the under-representation of the Mekong River channel within the network (Robichaud *et al.* 2001).

Based on the Forestry Law of 1996 and Prime Ministerial Decree No. 198/PM of 1999,

the Ministry of Agriculture and Forestry issued Regulation No. 0524/AF in 2001 (Ounekham and Inthapatha 2003).

Together, these regulations form the legal basis for protected area management and conservation of wildlife. However, they are not yet widely known among government staff and local communities throughout the country, and are difficult for the relevant authorities to enforce, given the authorities' limited human and financial resources (Ounekham and Inthapatha 2003).

Thailand

Despite a long history of formal conservation, dating back to the establishment of the Royal Forest Department (now the National Parks, Wildlife and Plant Conservation Department) in 1896, it was not until the 1960s that the first protected areas legislation was enacted in Thailand, with the Wild Animal Preservation and Protection Act in 1960, the National Park Act in 1961, and the National Forest Reserves Act in 1964 (Bugna and Rambaldi 2001). The National Forest Policy in 1985 provided the basis for an expanded protected area system, and targetted the maintenance of 40 percent of the nation's land area as forest. Of the other laws relating to biodiversity conservation enacted since then, the Conservation of National Environmental Quality Act in 1992, a revision of the Wildlife Protection and Reservation Act in 1992 and the Plant Variety Protection Act in 1999 are of greatest significance (Bugna and Rambaldi 2001).

There are numerous categories of protected area in Thailand, ranging from wildlife sanctuary to natural monument (Royal Government of Thailand 2002). The most important categories, from a biodiversity conservation perspective, are national park, wildlife sanctuary and managed resource wetlands. Wildlife sanctuaries are managed mainly for wilderness protection and science; national parks and marine national parks are managed for ecosystem protection and tourism; and managed resource wetlands are nationally important wetlands managed mainly for biodiversity conservation and the sustainable use of natural ecosystems (Royal Government of Thailand 2002). Compared with the generally better-funded national parks and wildlife sanctuaries, managed resource wetlands are often smaller, and restrictions on exploitation are only enforced for particular species. Many of the most effectively managed protected areas in the region are in Thailand, although even these face a number of major threats, including resident human populations, illegal exploitation of forest products, and dams and other large development projects (Srikosamatara and Brockelman 2002).

Thailand has a significantly greater number of national protected areas than any other country in Indochina. The profusion of protected areas in Thailand is partly explained by the greater degree of fragmentation of natural habitats compared with certain other countries in the region, but also by the tendency for large, contiguous blocks of natural habitat to be subdivided into smaller management units. As of July 2002, the Thai protected area network comprised 81 terrestrial national parks, 21 marine national parks, 55 wildlife sanctuaries and 55 managed resource wetlands, covering approximately 9 percent, 1 percent, 7 percent and 1 percent of the country respectively. In addition, there is also a series of 38 forest reserves scheduled to be gazetted as terrestrial national parks,

covering approximately 19,000 km^2 (equivalent to 3.7 percent of the total land area) (Carew-Reid 2002).

A comprehensive review of the national protected area network, conducted in 1987, concluded that most major terrestrial ecosystems in Thailand were well represented within the system (Kasetsart University 1987). The major exceptions were lowland evergreen forest, swamps and marshes and intertidal mudflats and mangroves. A second review, conducted in 1993, concluded that most terrestrial and aquatic ecosystems in the country were well represented within protected areas, apart from lowland wet evergreen forest in the peninsula, lowland moist evergreen forest in the south-east, peatswamp forest, intertidal mudflats and mangrove (Royal Forest Department 1993). While some of these gaps have been addressed by subsequent expansions of the national protected area system, coastal ecosystems in particular remain significantly under-represented.

Vietnam

Establishment of Vietnam's protected area network began in 1962, with the designation of the country's first protected area at Cuc Phuong. Protected areas in Vietnam comprise special-use forests, the only land-use category with the specific objective of biodiversity conservation. In 1997, MARD initiated a process to expand the special-use forests system to 2 million hectares by 2010. There are currently 95 decreed special-use forests, comprising 27 national parks, 40 nature reserves and 28 cultural and historical sites covering more than 1,800,000 hectares (Tordoff *et al.* 2004b). Although a small number of Vietnamese protected areas have levels of funding comparable to those in developed countries, the vast majority faces a variety of constraints in terms of financial resources, personnel and capacity (IUCN 2002b).

After Thailand, Vietnam has the largest number of national protected areas in the region. Again, this partly reflects the greater degree of fragmentation of natural habitats in Vietnam than in certain other countries. A review of the national protected area network conducted in 1999 revealed the biggest gap in coverage of terrestrial forest ecosystems within the network to be lowland evergreen forest between 300 and 700 m asl (Wege *et al.* 1999). Regarding other ecosystems, although some freshwater and coastal wetlands are included within the protected area network, these ecosystems remain notably under-represented (Tordoff *et al.* 2004b).

In the 1980s, the Vietnam National Conservation Strategy was published (IUCN and WWF 1995). This strategy, together with the Tropical Forestry Action Plan published in 1991, became the basis of the National Plan for Environment and Sustainable Development 1991-2000, which set out government policy for conservation and prioritized action areas (Tordoff 2002). The National Strategy for Environment Protection 2001-2010 and the accompanying National Environmental Action Plan 2001-2005 superseded this plan. An additional recent initiative, the National Five Million Hectare Reforestation Program 1998-2010, aims to restore forest cover to 1945 levels by the year 2010, preserve genetic resources and protect biodiversity. Government institutions, bilateral and multilateral donor organizations and international conservation organizations support its implementation through the framework of the Forest Sector Support Program (Tordoff 2002).

Regional Agreements

All countries in the region except China are members of the Association of South-East Asian Nations (ASEAN). Although international collaboration through ASEAN is increasing markedly, it is primarily linked to economic development and the adoption of more market-oriented policies and improved international trade fora. While the ASEAN Agreement on the Conservation of Nature and Natural Resources, adopted in 1985, offers an opportunity to forge further links, it has only been signed by Brunei, Indonesia, Malaysia, the Philippines, Singapore and Thailand, and has not yet entered into force. The agreement covers a broad range of conservation and development issues, including the conservation of threatened and endemic species and their habitats. In addition, ASEAN has a provision for the establishment of ASEAN Heritage Parks and Reserves, a number of which have been nominated within Indochina, such as Khao Yai National Park in Thailand and Hoang Lien National Park in Vietnam. ASEAN also has provisions to assist member countries to establish trans-boundary nature reserves.

The Asia-Pacific Migratory Waterbird Conservation Strategy, which is coordinated by Wetlands International with support from the governments of Japan and Australia, provides an international cooperative framework for all countries in the region (Asia-Pacific Migratory Waterbird Conservation Committee 2001). Under this strategy, three networks of sites of international importance for migratory waterbirds have been established: the East Asian Anatidae Site Network, the East Asian-Australasian Shorebird Site Network, and the North East Asian Crane Site Network. Conservation action being taken for these networks includes environmental awareness and education, surveys, and training courses in wetland management.

International Conventions

All five countries in Indochina are signatories to a number of international agreements promoting biodiversity conservation and sustainable natural resource use; these are summarized in Table 7. One of the most significant recent developments regarding participation in international agreements is Lao P.D.R.'s accession to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In addition, Thailand recently ratified the CBD, making the country eligible for CEPF support and GEF funding. To date, however, no country in the region has signed the Convention on Migratory Species, although all five countries support globally significant numbers of migratory species, including several globally threatened species.

Table 7. Participation in International Agreements by the Five Countries in Indochina

Country	Agreement						
	CBD	Ramsar	CITES	CMS	WHC	UNCCD	MAB
Cambodia	CP–c	CP (3)	CP	-	CP (1)	CP	NC (1)
China*	CP–c	CP (21)	CP	-	CP (28)	CP	NC (22)
Lao P.D.R.	CP–p	-	CP	-	CP (2)	CP	-
Thailand	CP–p	CP (10)	CP	-	CP (4)	CP	NC (4)
Vietnam	CP–c	CP (1)	CP	-	CP (4)	CP	NC (2)

Source: adapted from BirdLife International (2003a). Note: * = figures are for the whole country.
Key: CBD = Convention on Biological Diversity (CP–c = Contracting Party, National Biodiversity Strategy and Action Plan (NBSAP) completed; CP–p = Contracting Party, NBSAP in preparation); Ramsar = Convention on Wetlands of International Importance especially as Waterfowl Habitat (CP = Contracting Party; figures in brackets are the number of Ramsar sites at June 2003); CITES = Convention on International Trade in Endangered Species of Wild Fauna and Flora (CP = Contracting Party); CMS = Convention on Migratory Species; WHC = World Heritage Convention (CP = Contracting Party; figures in brackets are the number of World Heritage Sites at July 2002); UNCCD: United Nations Convention to Combat Desertification (CP = Contracting Party); MAB = UNESCO's Man and the Biosphere Program (NC = National Committee formed; figures in brackets are the number of Biosphere Reserves at November 2002).

CITES

CITES has been in operation since 1975 and has 169 member countries. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of species. CITES works by subjecting international trade in specimens of select species to certain controls. These require that all import, export, re-export and introduction from the sea of species covered by the Convention must be authorized through a licensing system. The species covered by CITES are listed in three appendices: Appendix I includes species threatened with extinction and can only be traded in exceptional circumstances; Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival; and Appendix III contains species that are protected in at least one country that has asked other CITES member countries to assist in controlling the trade. CITES is an important convention for Indochina, where trade in wildlife and wildlife products is a severe threat to a suite of globally threatened species.

Convention on Biological Diversity (CBD)

This convention, effective since 1993, has 188 member countries. Its objectives are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. It seeks to promote conservation of biological diversity in the wild, through requesting signatories to identify regions of biodiversity importance; establish a system of protected areas; restore degraded ecosystems; maintain viable populations of species in natural surroundings; and develop or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species and populations.

World Heritage Convention (WHC)

Effective since 1975, this convention has 176 member countries. Its aim is to identify and conserve cultural and natural monuments and sites of outstanding universal value, through the nomination of World Heritage Sites by national governments and their recognition by the United Nations Educational, Scientific and Cultural Organization (UNESCO). The great majority of World Heritage Sites in the region have been nominated on the basis of their cultural values, although several have been nominated for their natural values, such as Huai Kha Khaeng and Thung Yai-Naresuan in Thailand. Several other sites clearly meet the criteria for natural World Heritage Sites but have not yet been nominated, for instance the Annamite Mountains of Lao P.D.R. and Vietnam.

Ramsar Convention

Effective since 1975, the Ramsar Convention, also known as the Convention on Wetlands of International Importance especially as Waterfowl Habitat, has 151 member countries. It provides a framework for international cooperation for the conservation and wise use of wetlands. Globally, the contracting parties have designated 1,593 wetland sites, totaling 134.7 million hectares. Within Indochina, there are 15 Ramsar sites, comprising three in Cambodia, one in Hong Kong, 10 in Thailand and one in Vietnam, and including such sites as Mai Po and Inner Deep Bay in Hong Kong and Xuan Thuy in Vietnam.

UNESCO's Man and the Biosphere Program (MAB)

This program operates through national committees and focal points among UNESCO member states. It aims to develop a basis, within the natural and the social sciences, for the conservation and sustainable use of biological diversity and for the improvement of the relationship between people and their environment, encouraging interdisciplinary research, demonstration and training in natural resources management. An essential tool for the MAB program is the network of Biosphere Reserves, which are areas of terrestrial and coastal ecosystems where solutions are promoted to reconcile biodiversity conservation with its sustainable use. They include Xishuangbanna in southern China, Sakaerat in Thailand and Tonle Sap in Cambodia.

Convention on Migratory Species of Wild Animals (Bonn Convention)

The Bonn Convention has been implemented since 1983 and has 95 member countries. Its objective is to protect migratory species that cross international borders. The species are listed in two appendices of the convention. The convention requires parties to prohibit the taking of species on Appendix I, to reach agreements with other range states for the conservation and management of species on Appendix II and to conserve and restore important habitats, remove impeding activities or obstacles, and tackle other factors that endanger Appendix I species. To date, no country in Indochina is a party to the convention, although Cambodia and China participate in some related agreements.

SYNOPSIS OF CURRENT THREATS

The combination of economic development and an increasing human population is creating unprecedented pressures on the region's natural resources, and overexploitation has now reached critical levels in many areas. This is compounded by the lack of effective planning and management systems to control these pressures. The principal

responsibility for the management of natural resources and biodiversity rests with government institutions but these often lack the financial resources, technical expertise, and political will to fulfill this responsibility effectively. Rapidly increasing levels of consumption have led to massive increases in natural resource exploitation and conversion of natural habitats to other land uses. The two over-riding immediate threats facing the region's plant and animal species are habitat loss and overexploitation of plant and animal species. One or both of these are the principal threats to nearly all globally threatened species in the region.

Probably less than 5 percent of the Indo-Burma Hotspot is covered by forest in pristine condition, while mildly damaged yet ecologically functional forest covers another 10 to 25 percent (van Dijk *et al*. 1999). The hotspot ranks in the top 10 hotspots for irreplaceability, and in the top five for threat. In the cases of many species, sites and even landscapes, these threats are immediate and severe (e.g. Duckworth *et al*. 1999, Baltzer *et al*. 2001, Nooren and Claridge 2001, Tordoff 2002).

Overexploitation of Natural Resources

Overexploitation of Animals

Unregulated, unsustainable, unreported, and generally illegal over-exploitation has driven many animal species in the region to the verge of extinction in the wild, and severely suppressed populations of others (e.g. Nash 1997, Nooren and Claridge 2001, Oldfield 2003). There are several inter-related causes, including subsistence needs, recreation, and incidental, opportunistic exploitation. However, trade demand from both domestic and international markets is often a key factor driving overexploitation. Trade demand is a particularly significant factor in the case of certain species, especially ones used in the manufacture of traditional medicines. For instance, a recent re-evaluation of the global threat status of turtles in Asia (a significant proportion of which occur in Indochina) resulted in 18 species being assessed as Critically Endangered and 27 as Endangered, primarily as a result of trade-driven exploitation (van Dijk *et al*. 2000, Stuart and Thorbjarnson in press).

Trade-driven overexploitation is impacting animal populations throughout Indochina. Prior to the 1990s, the greatest pressures were placed on animal populations in China, which is the major market for wildlife products in the region. During the 1990s, the focus of pressure shifted to populations in Vietnam, then Lao P.D.R. and, finally, Cambodia, as the economies of these countries opened to international trade, infrastructure developments linked previously remote areas to outside markets, supplies of wildlife products in China became depleted and domestic demand for wildlife products increased. Although populations of certain high-value animal species appear still to be more healthy in parts of Cambodia than in Vietnam, Lao P.D.R. and southern China, there are strong indications that populations of the highest-value species, such as tiger, have already undergone precipitous declines as a result of trade-driven hunting.

Limited resources, manpower, capacity, and motivation among enforcement agencies mean that overexploitation of animal species continues largely unabated. Incentives to

hunt these species are often high for rural people, particularly where there is an actual or perceived trade demand. The values of some species have risen to the point that even formerly secure populations in more affluent areas are heavily trapped, as in the case of Chinese three-striped box turtle in Hong Kong (Lau 2003). Many target species have been reduced to such low levels that traders now acquire wildlife and wildlife products from further afield, even outside the region. For example, most pangolins found in trade in Vietnam recently have been in shipments from Malaysia and Indonesia (TRAFFIC Southeast Asia - Indochina *in litt*. 2003).

Conservation action is required in a number of thematic areas, at site, landscape, national, and international levels, if populations of species threatened by overexploitation are to be secured. Site-based action is required to reduce pressure on wild populations. A particularly important site-based action may be control of indiscriminate snaring, which frequently results in the capture of species other than those targeted by hunters, with potentially devastating consequences for ground-dwelling species, notably saola. Other important actions include control of domestic and international trade in wildlife and wildlife products. Animals at greatest risk from trade based on current knowledge include pangolins, primates, bears, cats, civets, cervid deer, wild cattle, rhinoceroses, Asian elephants, turtles, crocodiles, monitor lizards and numerous snake species.

Overexploitation of Plants

The threat posed to plant species from overexploitation for local consumption and trade is potentially as massive as that to animal species. However, very little accurate information has been published on the impacts of overexploitation on plant species in the region. Thousands of plant species in the region have documented uses in human societies, from decoration to construction, and from food to traditional medicine. Of an estimated 4,200 to 4,500 plant species in the forests of Hainan Island, more than 2,900 species are used locally, for timber trees, medicinal plants, rattans, and wild fruit (Davis *et al*. 1995). Overexploitation of plants does not, therefore, only have implications for biodiversity but also for rural livelihoods, as forest products form an important component of the livelihood strategies of many households.

Lack of data constrains assessments of the magnitude of this threat, but its effects on many groups of plants, for instance orchids, are potentially devastating. Plant species with high economic values are often particularly at risk, most notably timber species. Indochina's forests support a great diversity of commercially valuable timber species, including *Erythrophleum fordii*, *Dalbergia* spp., various members of the Dipterocarpaceae family (such as *Dipterocarpus* spp., *Shorea* spp. and *Hopea* spp.) and various conifers, most notably *Fokienia hodginsii*. Stocks of most timber species in the region have declined significantly over recent decades, although the implications of this for the long-term viability of populations of these species are not fully known. Other economically valuable plant species threatened by overexploitation include *Aquilaria crassna*, which is a source of agarwood, and *Panax vietnamensis*, which is used to produce a tonic; both of these species are threatened with extinction in Vietnam as a result of overexploitation (Tordoff *et al*. 2003). Demand from the traditional medicine trade is also a significant factor contributing to the depletion of Himalayan yew (*Taxus*

wallichiana) populations in Yunnan Province, and the bulk movement of wild orchids *Dendrobium* spp. from Lao P.D.R. and Vietnam to China.

Overfishing

As human populations and levels of consumption increase, overfishing presents a growing threat to the region's freshwater fish diversity, with potentially significant indirect impacts on other species through, for example, depletion of food supply. The region's most productive freshwater fishery, Tonle Sap Lake, has seen the recent disappearance from catches of some of the larger, more valuable species, an overall decrease in average fish size and lower catches per unit effort (Baran *et al*. 2001). However, overfishing is not restricted to industrial-scale fisheries. The increasing incidence of poison, electric and, even, bomb fishing on a local scale (e.g. Chen 2003), as the region's rivers and non-flowing wetlands succumb to increasing pressure of human settlement, especially in conjunction with other threats, has the potential to cause drastic reduction in whole fish communities (Baltzer *et al*. 2001).

Habitat Loss

Commercial Logging

Forests are the key habitats for a high proportion of the region's globally threatened plant and animal species. However, the region's forests have been the focus of commercial logging for decades, which has had a massive impact on their extent and condition. While commercial logging usually degrades forest habitats, it is not always a direct cause of forest loss *per se*. However, the construction of logging roads often opens up forest areas to subsequent settlement and conversion to other land uses. Moreover, for some animal species, the direct effects of habitat degradation and loss may be compounded by increased susceptibility to hunting in small forest patches or in forests penetrated by roads.

Within Indochina, lowland evergreen and semi-evergreen forests have been the principal focus of commercial logging activities. Lowland evergreen forests have been so severely affected that few intact areas remain; all remaining blocks of lowland evergreen forest are of critical conservation importance. In 1995, less than 5 percent of the level lowlands in Thailand retained their forest cover (Stewart-Cox and Cubitt 1995). On Hainan Island, natural forest cover was 25.7 percent in 1956 but, by 1983, only 7.2 percent remained (Maxey and Lutz 1994). Loss of natural forest cover in China, Thailand and Vietnam was so extensive during the second half of the 20th century that, by the end of the century, the forestry industries of these countries had gone into substantial decline. In addition, decline of the national forest estates of these countries contributed to major environmental problems, such as flooding and landslides. For instance, floods in Nakhon Si Thammarat province in Thailand and catastrophic flooding in the Yangtze Basin in China were both instrumental in changing national policies towards logging of natural forests (Carew-Reid 2002, BirdLife International 2003a). Such problems led to nationwide logging bans in Thailand, Vietnam and China, in 1989, 1997 and 1998, respectively. While the observance of these bans has not been absolute, the pressures on natural forests in each country have declined substantially. However, because demand for

wood products in each country continues to increase, and is not fully met by commercial timber plantations, these logging bans have contributed to increased pressure on natural forests in Lao P.D.R. and Cambodia. In Lao P.D.R., commercial logging continues in parts of the country, while, in Cambodia, although a nationwide moratorium was introduced in 2002, large parts of the national forest estate remain under timber concessions, and there are strong pressures to resume commercial logging operations.

Conversion of Forest to Cash Crops

Conversion of forest to cash crop plantations is a particularly significant cause of forest loss in the region. There has been extensive replacement of natural forests by a variety of cash crops, including sugar, tea and coffee in southern China (MacKinnon *et al*. 1996), and oil palm and rubber in peninsular Thailand (e.g. Wells 1999). Montane forests in Vietnam and Lao P.D.R. are being converted to coffee plantations (Eames 1995, Duckworth *et al*. 1999), and numerous other cash crops (for example, cashew nuts) have had significant localised impacts. As domestic and export demand for many commodities is likely to increase, remaining forests are becoming increasingly Vulnerable to conversion. For example, deciduous dipterocarp forests in Cambodia are being converted to teak and pulp wood plantations (BirdLife International 2003a). The use of fire to clear forest for plantations has had a particularly devastating impact in the late 20th century (BirdLife International 2003a). This is contributing to a reduction in species diversity in evergreen forests, and causing them to grade into more deciduous forest types (van Dijk *et al*. 1999). Even reforestation programs, which have been underway for some years in southern China and Vietnam, have a heavy focus on plantation of monocultures of eucalypts or pines, which are fire prone, nutrient depleting and ecologically sterile (MacKinnon *et al*. 1996, 2001).

Clearance of Forest for Shifting Cultivation

Throughout Indochina, rural communities in upland areas practice various forms of shifting cultivation, typically involving rotational systems of swidden fields and regenerating fallows. While shifting cultivation is often cited as a cause of forest loss, there is significant variation in the forms of shifting cultivation practiced in the region, and not all forms have been historically, or are presently, destructive to forest. While, in some parts of the region, shifting cultivation has been correlated with forest degradation and loss, there is also evidence that, in other areas, shifting cultivation is being practiced with minimal impacts on biodiversity (E. Webb *in litt.* 2004). In order to resolve the on-going debate over the impacts of shifting cultivation on biodiversity, there is a need for additional information on which systems are compatible with conservation, and which may require modification.

Agricultural Expansion and Intensification

Economic development and population growth have led to an intensification and expansion of permanent agriculture in many lowland parts of the region. Extensive drainage and conversion of wetlands, most notably seasonally inundated grasslands, has occurred to accommodate this. In the Mekong Delta of Vietnam, almost all natural grasslands have now been converted for intensive rice cultivation (Buckton *et al*. 1999). The formerly extensive wetlands in the Chao Phraya Basin of central Thailand have

suffered the same fate (P. D. Round *in litt*. 2002). The region's low-intensity agricultural systems, which not only represent a rich tapestry of landscape, tradition and culture but also support biodiversity of considerable global importance, are also being fragmented into increasingly isolated pockets, as a result of agricultural intensification (P. D. Round *in litt.* 2002).

Conversion of Coastal Habitats

Intertidal mudflats in Indochina are the feeding areas of hundreds of thousands of migratory and resident shorebirds, at least 20 shorebird species occur in internationally significant numbers, and several areas qualify for Ramsar designation (Round 2000, Wetlands International 2002). Piecemeal conversion of intertidal mudflats through mangrove afforestation is a potentially serious threat to the most important areas for migratory shorebirds, including the Inner Gulf of Thailand and the Red River Delta of Vietnam (Pedersen and Nguyen Huy Thang 1996, Erftermeijer and Lewis 1999). Mangrove afforestation changes the nature of the substrate, and tends, therefore, to make intertidal mudflats unsuitable for bird species for which they are the preferred feeding habitat, such as Black-faced Spoonbill (Yu and Swennen 2001). The forces driving this form of conversion include the coastal protection, land reclamation, and aquaculture development agendas of national and local governments, and financial incentives from national forestry programs.

Aquaculture development is also driving the conversion of other coastal habitats. Throughout the coastal zone of the region, mangroves, lagoons, marshes, and other wetlands are undergoing widespread and rapid conversion to shrimp and fishponds. This has particularly affected coastal mangroves, including a number of Ramsar sites. It should be noted that traditionally managed, extensive aquaculture, such as is practiced at Mai Po Nature Reserve in Hong Kong, can provide valuable habitat for many waterbirds, including a number of globally threatened species (BirdLife International 2003a). However, various forces, including the need for aquacultural pond owners to generate rapid financial returns in order to repay loans for the construction and lease of ponds, are driving a shift from extensive aquaculture to unsustainable forms of intensive aquaculture, leading to die-back of mangrove and loss of habitat for many waterbirds.

Infrastructure Development

The region is experiencing rapid economic growth and associated urban, industrial and infrastructure developments are having severe direct and indirect impacts on natural habitats. One of the key pillars of the economic development strategy of each country is the extension of the national road network. In Vietnam, for example, a second major north-south highway linking Hanoi with Ho Chi Minh City has been routed through the Annamite Mountains, bisecting several protected areas. At the regional level, major road networks are being created that link capital cities and major ports, such as the East-West Corridor linking the port of Da Nang in Vietnam with Bangkok, via southern Lao P.D.R. As well as causing direct loss and fragmentation of habitat, creating barriers to the dispersal of species such as gibbons, new roads open up previously inaccessible areas to settlement and habitat conversion. Moreover, new roads strengthen economic links

between remote rural areas and urban centers, facilitating the expansion of wildlife trade networks and placing increased pressure on plant and animal populations.

Increasing regional demand for flood control, irrigation, and electricity generation is fuelling a wave of dam construction on large rivers. The reservoirs created often flood important terrestrial habitats, while artificially managed discharges cause major alterations to seasonal flow regimes and natural sedimentation processes. The dams themselves impact directly on fish migration routes and access to spawning grounds: most lack fish passes or strategies to maintain aquatic communities downstream (Dudgeon 2000b). The Yali Falls dam on the Sesan River in Vietnam, for example, has had serious deleterious effects on the river's fish and sandbar-nesting bird communities downstream in Cambodia (Baird *et al.* 2002, Seng Kim Hout *et al*. 2003). Another impact of dam construction is that displaced human communities are often relocated in areas where they clear or place additional pressure on natural habitats.

Mining and Quarrying

Mining and quarrying for ores, gems and construction materials is causing localised but significant habitat loss in the region. Quarrying of limestone for cement manufacture is a particular threat to limestone karsts, whose potential severity is greatest in smaller, more isolated karsts, such as those in the Kien Luong area in southern Vietnam, which also happen to be among the richest in terms of invertebrate endemism (L. Deharveng *in litt.* 2003). Mine access roads and temporary settlement by mine workers can also have serious indirect impacts, including increased levels of hunting by mine workers living in temporary camps in remote forest areas. Moreover, several mining techniques can lead to pollution of aquatic systems by sediment or toxic chemicals, with negative impacts on freshwater biodiversity.

Invasive Species

Deliberate and accidental introduction of alien invasive species has occurred at a number of sites in Indochina (e.g. Dudgeon and Corlett 1994, Fellowes 1999, Li and Xie 2002), although the impacts on biodiversity have been little studied to date, and are, thus, poorly understood. Certain invasive species are problematic at certain sites, for example Water Hyacinth *Eichhornia crassipes* and *Mimosa pigra* in Tonle Sap Lake and inundation zone (MacDonald *et al*. 1997), Pricklypear *Opuntia* sp. at Khao Sam Roi Yot National Park in Thailand (J. Parr verbally 2003) and Mile-a-Minute *Mikania micrantha* in the New Territories of Hong Kong (Liu *et al.* 1997). However, there is little evidence that invasive species are leading to widespread declines of native species across Indochina, and their impacts are probably less severe than many other threats to biodiversity in the region.

Pollution

Urbanization, industrialization, and agricultural intensification are leading to increased levels of pollution throughout the region. Discharge of industrial waste into major waterways frequently occurs unregulated, and agrochemicals applied onto agricultural land rapidly enter river systems, wiping out sensitive organisms and causing their predators to desert and search food elsewhere. According to the Division of Agricultural Toxic Substances of the Department of Agriculture, imports of herbicides into Thailand

trebled in quantity between 1987 and 1994 (P. D. Round *in litt.* 2002). Sewage treatment is still scarce in the region, and mass dumping of raw sewage is frequent (BirdLife International 2003a). With the intensification of agriculture as a major socioeconomic strategy, the extensive use of agrochemicals will pose many problems for species and ecosystems in the immediate future. As well as the direct impacts on species through toxicity, the severe declines in invertebrate abundance associated with high levels of pesticide use are one of the major factors contributing to the collapse of open country and peri-urban bird populations in agricultural landscapes throughout the region.

Root Causes

The underlying causes of the threats outlined above are often deep rooted and complex. Many have their origins in regional and global economic trends, on-going demographic changes and the socio-political history of the region. They may be becoming further compounded by the unpredictable impacts of climate change. A brief overview of major root causes follows.

Economic Growth and Increasing Consumption

Economic growth and ever-increasing consumption are the main underlying causes of habitat loss and degradation, and overexploitation of plant and animal species. All countries in the region are, to varying degrees, pursuing market-oriented economic policies and export-led development strategies, on the promise of strong economic growth and with the encouragement and support of external donors. This is especially notably in three critical sectors for biodiversity conservation: forestry, fisheries and agriculture.

The trend of rapid economic growth across Asia over the past decade has increased regional demand for natural resources, particularly timber and cash crops, resulting in the degradation and conversion of natural habitats. Changes in food consumption patterns have exacerbated this trend, particularly an increase in animal protein consumption. For example, overall meat consumption in China increased by 117 percent between 1991 and 1998 (Tansley and D'Silva 1999), with dramatic implications for fodder demand and land use. Growing affluence among ASEAN nations is also resulting in an increasing demand for products such as paper and palm oil. Increasing levels of consumption in developed countries are also contributing to loss of natural habitats in the region, for example, the major export markets for shrimp farmed in aquacultural ponds in the region's coastal zones are Japan and western countries.

Capacity Limitations

Many threats to biodiversity arise from situations where government agencies mandated to manage natural resources face limitations of personnel, resources, training, and motivation. Capacity limitations are one of the major reasons why protected area systems in the region function so inefficiently. They continue to be plagued by a suite of management problems, ranging from low staff morale, lack of incentives for good performance, limited technical capacity, inappropriate budget allocations, and overemphasis on infrastructure development. Inadequate regulation of companies, illegal

land clearance and encroachment of protected areas are other symptoms of capacity limitations.

Economic Incentives

Subsidies within the forestry and agriculture sectors have promoted increased production of a number of products linked to forest loss, including forest products and cash crops, and promoted agricultural intensification and the large-scale use of agrochemicals. Subsidies for tree planting have led to the afforestation of intertidal mudflats, grasslands and other natural non-forest habitats. Such perverse incentives may be direct, for example tax write-offs, grants or low-interests loans, or indirect, for example low land rents, low labor costs, construction of “free” access roads and other infrastructure, or weak environmental protection regulations.

Undervaluation

Although biodiversity has important cultural, spiritual, recreational, and personal values, government policies frequently recognize natural resources only for their market value, particularly in developing countries, where the environment, including biodiversity, is severely undervalued. Indeed, the fact that quality of life is dependent upon a complex range of ecological functions that provide clean air, pure water, fertile soils and other ecosystem services, is seldom even considered. The undervaluation of ecological services in Indochina may be partly because dispersed services, such as carbon sequestration, although important globally, are of less significance to national governments, and partly because immediate gains from exploiting a natural resource are frequently more attractive to decision makers than long-term, theoretical benefits from its maintenance. Furthermore, many of the most important values of biodiversity may simply be unquantifiable.

A recent study estimated the combined value of 17 different ecosystem services, including climate regulation, water supply, and food production, at between $16 and $54 trillion per year (Costanza *et al*. 1997) or twice the global gross national product. Forests and wetlands are particularly undervalued, when their full environmental and social value is taken into account (for example, nutrient cycling, climate regulation, erosion control, and recreation). A number of recent projects, including the economic review of protected areas undertaken for the Lower Mekong Countries (ICEM 2003) and a review of the roles of natural vegetation in China (MacKinnon *et al.* 2001), have aimed to demonstrate the economic values of biodiversity.

Inappropriate Land Tenure

Inappropriate systems of land ownership, particularly lack of land tenure and involvement in management of local communities, have been a key underlying cause of biodiversity loss. Large tracts of natural habitat under the nominal ownership of the state have frequently failed to retain their biological and ecological values. Land tenure is an important consideration in people's attitudes towards land use and significant in terms of habitat loss, especially deforestation. Unresolved land tenure arrangements can facilitate spontaneous settlement and conversion of forested areas. Many countries in the region are presently undertaking major reforms to their land policies, including the allocation of

land to private owners. Unclear policies and lack of technical capacity within the government institutions involved have often meant that the land reform and allocation processes have further marginalized the poorer sections of rural communities, and exacerbated threats to biodiversity.

Global Climate Change

Global climate change is an emerging threat, which has manifested itself most tangibly in the increasing frequency, severity, and geographic extent of regional droughts. Concern that the frequency and severity of *El Niño* events will increase with global warming renders many forests more susceptible to fire. The medium to long-term impacts of climate change on the region's biodiversity are far from being fully understood but clearly warrant careful scrutiny, given the devastating effects to date on the neighbouring Sundaland hotspot (BirdLife International 2003a). Although it is not possible to predict the precise effects with any degree of confidence, under any scenario of significant climate change, the spatial distribution of habitats and biotic communities is likely to change, as some habitats increase in area while others decrease.

SYNOPSIS OF CURRENT INVESTMENT

The purpose of this section is to assist in identifying funding gaps and opportunities for conservation investment in Indochina. This is achieved through an analysis of current investment by source, country, thematic area, and conservation corridor. In addition to an evaluation of the amount of investment and number of projects, consideration is given to which conservation approaches are achieving results, and where the greatest opportunities to engage civil society in conservation may lie. This section helps to define the niche for CEPF investment by identifying major gaps in conservation investment.

An attempt was made to collate data on all conservation projects taking place during 2003 and pipeline projects expected to begin before the end of 2004. In addition, data on select, recently completed projects were also collated to illustrate thematic patterns in conservation investment in the region. Although efforts were made to collate comprehensive data on conservation investments, gaps and ambiguities in the data and about specific funding periods, amounts and donor-implementer relationships remain. Moreover, although a significant proportion of current investment in conservation is made by national governments in the region, precise details of these government investments were difficult to obtain. Consequently, the analysis that follows includes more information about investment by international donors.

Major Sources of Investment

National Government Investment

National governments in the region have developed, or are in the process of developing, national strategies and action plans for the conservation and sustainable use of biodiversity, as part of their international obligations under the CBD. However, with the exception of Hong Kong and Thailand, actual levels of government funding for implementation of biodiversity conservation activities are generally quite low, as biodiversity conservation is usually a low budgetary priority for national governments,

and is frequently viewed as the responsibility of international donors. Consequently, a significant proportion of government funding for biodiversity conservation is in the form of co-financing (often in-kind) for donor-funded projects. National protected area networks are major recipients of government funding, although the bulk of their funding is typically for infrastructure and staff costs, with very modest sums available, in most cases, for operational costs. In addition, all national governments in the region are investing in biodiversity-related research, principally through government academic institutions. In general, however, this research is focused on human uses of biodiversity rather than its conservation, and is rarely published in peer-reviewed journals.

Bilateral and Multilateral Donors

The majority of international funding for biodiversity conservation in Indochina comes from or via bilateral and multilateral donor agencies. Bilateral donors making significant investments in conservation in the region include Danish International Development Assistance (Danida), the Japanese government, The Netherlands government and the U.S. government. Multilateral donors include the Asian Development Bank (ADB), the European Union (EU), UNDP, and the World Bank. In addition, there are a significant number of GEF-funded projects in the region, implemented through either UNDP or the World Bank.

The indicative allocations for biodiversity projects in the recently authorized phase 4 of the Global Environment Facility for the five countries in the Indochina Hotspot are: China, $44.3 million; Laos, $5.2 million; Thailand, $9.2 million; and Vietnam, $10.2 million. Cambodia does not have a specific allocation, but is one of 93 smaller countries with a group allocation of $146.8 million. Each member of this group is eligible to access up to $3.5 million in GEF-4, but the average grant will be closer to $1.5 million for each of those countries. No amount is guaranteed to countries receiving GEF funding, but the actual figures are likely to be close to the indicative allocations awarded to the governments of each country. It is unclear how or to what extent civil society will play a role in implementing GEF-financed projects under GEF-4. Given the relatively weak capacity of civil society in the region it appears unlikely that NGO, particularly local civil society organizations, will benefit from GEF-4 resources to a significant degree or substantially participate in projects financed by GEF. Therefore, the role of CEPF grants in building civil society participation in natural resource management decisions and biodiversity conservation in the priority corridors, and more broadly across the region, is unlikely to be duplicated by GEF funds.

International Conservation Organizations and Foundations

While some of the international conservation organizations active in the region have core funding, for example the Wildlife Conservation Society, WildAid and WWF, all need to raise additional funds for at least some, and in some cases all, of their programs. Conservation investment by international conservation organizations is frequently in the form of co-financing for donor-funded projects, or to cover office, administration and management costs. A number of international conservation organizations' national offices based outside of the region, for example WWF-US, fund conservation projects in the region, often through local partners or program offices. Relatively few international

foundations are actively supporting biodiversity conservation in the region, although their contributions are often significant. International foundations providing significant funding for conservation in the region include the Barbara Delano Foundation, the Ford Foundation, and the National Fish and Wildlife Foundation (NFWF). The MacArthur Foundation announced awards of sixteen grants totaling nearly $4.5 million for the region in June 2006.

National NGOs

Investment by national NGOs in conservation is extremely low, reflecting the current under-development of local civil society in most countries in the region. Many organizations are newly established and lack extensive memberships and well-developed bases of financial support. Even in Thailand, where there are now 80 to 120 government-registered "green" NGOs, a lack of financial resources to invest in their own development, let alone specific projects, is a key limitation to their effectiveness. This scenario is mirrored in most local NGOs elsewhere in the region, which typically implement small projects with support from donor agencies.

Private Sector

Although occasional private donations are made to biodiversity conservation, on the whole the contribution of the private sector to conservation investment in Indochina is very limited. To a certain extent, this is a reflection of the level of economic development in the region. Even in Thailand, which has experienced high rates of economic growth over the past decade, there has, as yet, been little investment by the private sector in conservation. One exception is Hong Kong, where private donations are important to a number of local conservation initiatives, including the privately funded KFBG. Examples of private sector-supported conservation initiatives in the region include marine conservation programs in Vietnam funded by BP, which is currently involved in gas exploitation off the southern coast of the country. In addition, BP supports several small projects in the region each year, through the BP Conservation Program. There are also projects supported by Save The Tiger Fund, a collaboration between NFWF and ExxonMobil Foundation and, more recently, a joint initiative of CEPF, NFWF, and ExxonMobil to support a Campaign Against Tiger Trafficking (CATT).

Summaries of Investment by Country

Cambodia

The majority of current conservation investment in Cambodia is from or via bilateral and multilateral donors. The GEF is one of the largest sources of investment in the country, investing more than $10 million across seven biodiversity conservation projects, with UNEP, UNDP, and the World Bank as implementing agencies. Under the GEF Resource Allocation Framework (RAF), Cambodia has not been given a country allocation; rather it is included among the 93 countries that can request project financing from the $146.8 million group allocation over the next four years. Other donors making multiple investments in biodiversity conservation include Danida, the Department for International Development of the UK government, the MacArthur Foundation, the U.S. Fish and Wildlife Service (USFWS), and the World Bank. ADB has a major input into the Tonle

Sap Conservation Project, co-financed by GEF through UNDP. Investment by the government of Cambodia is mainly limited to co-financing large projects, funding the national protected area system and management of forest and wildlife outside of protected areas

International conservation organizations active in Cambodia include BirdLife International, CI, FFI, ICF, IUCN, TRAFFIC, WildAid, WCS, and WWF. Funding for their numerous projects derives from a variety of sources, particularly multilateral and bilateral donor agencies such as USFWS and Danida; international foundations such as the MacArthur Foundation, which is investing more than $1.6 million across five projects; and international conservation organizations' national offices based outside of the region, for example WWF-US.

The Cardamom and Elephant mountains are the focus of three major conservation initiatives, linking and strengthening the management of protected areas and conducting patrolling and enforcement, with several million U.S. dollars of funding from the Barbara Dellano Foundation, the Global Conservation Fund at CI, UNDP/GEF, the United Nations Foundation, and other sources. The Agence Française de Développement (AFD) recently made a three-year commitment to finance conservation efforts in the Cardamoms Forest in Western Cambodia. In addition, it committed $2.5 million toward a trust fund for the Caradmoms Forest.

Tonle Sap Biosphere Reserve is the focus of the ADB/UNDP/GEF-funded *Tonle Sap Conservation Project*, with a budget of $19 million (including a $4 million contribution from the government of Cambodia). The aim of the project is to support economic development, community-based natural resources management and conservation of globally significant biodiversity through protection and/or sustainable use.

Virachey National Park is the focus of a $5 million World Bank/GEF-funded project that aims to build capacity among national park staff and strengthen conservation management. Elsewhere in Cambodia, the extensive dry forest landscapes of the northern and eastern plains are the focus of significant ongoing and planned investment by UNDP/GEF, the International Tropical Timber Organization (ITTO), and WWF-Netherlands.

In addition to the aforementioned projects, there are numerous smaller investments throughout the country funded by multilateral and bilateral donors and foundations. These investments are usually for species-focused and site-based actions, including developing models of local, stakeholder-based conservation.

China

Numerous multilateral and bilateral agencies, foundations and international conservation organizations are investing in biodiversity conservation in China, including CI, ITTO, TRAFFIC, UNDP, UNEP, UNESCO, the World Bank, WWF, the Ford Foundation, the MacArthur Foundation, and the Rockefeller Foundation as well as the governments of Australia, Canada, Germany, Japan, The Netherlands, Norway, Switzerland, the UK, and the United States. In addition, the GEF is funding a number of biodiversity conservation

projects, through either UNDP or the World Bank. China has an indicative allocation of $44.3 million under the RAF, second only to Brazil in terms of eligibility for GEF4 resources for biodiversity.The EU has pledged more than $30 million through a joint EU-China Biodiversity Program over the next five years. Not all of the aforementioned donors are currently active in southern China. Others are active at the central level, and it is difficult to identify their proportional investment into southern China.

A number of major new, ongoing, and recently completed biodiversity conservation projects with nationwide implementation have included activities in the part of southern China within Indochina. These include the World Bank-implemented "China Nature Reserves Management Project," which supported management initiatives between 1995 and 2002 at nine nature reserves across the country, including Xishuangbanna in Yunnan province. Overall, this project received $17.9 million in funding from the GEF through the World Bank and $5.7 million in co-financing from the government of China. Another World Bank-implemented initiative with activities in southern China is the Protected Area Management Component of the World Bank/EU-funded "Sustainable Forestry Development Project." This component, which has $16 million in GEF funding, will protect and manage globally significant biodiversity at Jianfengling Nature Reserve in Hainan Province and 12 other forest nature reserves and invest in provincial-level capacity building in seven provinces, including Hainan and Yunnan. The GEF Council recently approved the World Bank-implemented Guangxi Integrated Forestry Development and Biodiversity Conservation project, which will receive $5.6 million from the GEF and nearly $200 million on co-financing from the government of China. It will address closely inter-linked threats to Guangxi’s natural forests, watersheds, and biodiversity through an integrated approach to managing all these natural resources at the landscape level. While the project will focus on the development and implementation of management plans for five globally significant, high priority nature reserves that are outside of the CEPF priority corridor, tremendous opportunities for operational syergies and cross border linkages exist. Specifically through sharing data from biodiversity surveys and research to increase knowledge particularly of karst biodiversity to better integrate biodiversity conservation into the broader landscape and sharing lessons learned on the development and implementation of simple participatory monitoring and evaluation systems.

A number of important projects in the part of southern China within Indochina include those funded by the German and Dutch governments. GTZ of Germany has projects to rehabilitate and protect tropical forests in Yunnan and Hainan provinces. In Yunnan, this has entailed working closely with ethnic minority communities, while, on Hainan Island, the emphasis has been on building the capacity of the Forestry Department. The Sino-Dutch "Forest Conservation and Community Development Project," began in 1998, with the objective of conserving the subtropical and tropical forest and biodiversity resources in Yunnan. The project has worked at some sites in the part of southern China within Indochina, including Caiyanghe Nature Reserve. In addition to the above projects, the Ford Foundation has funded the Kunming Institute of Botany, CAS and Xishuangbanna Tropical Arboretum to investigate traditional cultivation practices of ethnic minorities in Xishuangbanna that are related to forest and biodiversity conservation.

A unique organization in the region is the Hong Kong-based KFBG, dedicated to environmental education, conservation and sustainability in Hong Kong. KFBG has a healthy operating budget (about $6 million in 2001), of which a limited portion goes into its Mainland China Program. KFBG has launched various collaborative projects in Guangxi, Guangdong and Hainan provinces of southern China, including establishment of a communication network via its magazine *Living Forests* and updating of information on distribution and status of many species through surveys of nature reserves and monitoring of wildlife markets. It also supports forest rehabilitation projects and field-based postgraduate research.

Hong Kong is exceptional within the region for its well-funded government departments responsible for biodiversity conservation (particularly the Agriculture, Fisheries and Conservation Department (AFCD), and the Environmental Protection Department). Government and local corporate funding sources are generally sufficient to meet the needs of conservation in the Special Administrative Region, and the government institutions (especially AFCD) have long received technical support from NGOs, notably WWF-Hong Kong and KFBG. WWF-Hong Kong has also had a wider role since the 1990s in providing training for protected area staff from East Asia (particularly China) at Mai Po Nature Reserve, which it manages for the government, raising much of its own funding from community events such as the annual "Big Bird Race." WWF-Hong Kong also works with fish farmers and development companies to minimise conflicts with nature conservation in the Deep Bay area, and has recently extended this conservation work to important wetlands across the Pearl River estuary in Macau.

CCICED's Biodiversity Working Group has provided extensive and wide-ranging advice to central government related to the implementation of the CBD and other related issues, as well as launching a range of projects such as publication of illustrated guidelines for incorporating biodiversity conservation in economic development, a China Species Information System, a study on invasive species, field guides to birds and mammals, red listing workshops for China's threatened fauna and flora and guidelines for the restoration of China's degraded environment using natural vegetation (MacKinnon *et al*. 2001). In addition, CCICED's Task Force on Forestry has tried to improve implementation of the Natural Forest Protection Program, as well as the Sloping Land Conversion Program (see below). CCICED also has active Task Forces on Protected Areas, Prevention of Non-Point Agriculture Pollution, Agriculture and Rural Development, Environmental and Natural Resources Pricing and Taxation, Integrated River Basin Management, and the World Trade Organization and the Environment

Initiated in 1998 to protect state-owned natural forests in 17 provinces, autonomous regions and municipalities, the Natural Forests Protection Program of the government of China is active in the region. Initiatives supported under this program include "closure" of mountains for reforestation, strengthening forest management and protection, and afforestation by broadcasting seeds and planting seedlings.

Started in 1999 to tackle the problem of soil erosion in key areas, the government of China's Return Slope Farmland to Forests Program was extended in 2001 to cover 20

provinces. Under this program, farmers are to be compensated for giving up farmland for conversion to forest, with grain and cash from the central government. Subsidies are also provided for the nursing and planting of tree seedlings.

Initiated in 2001 to protect wildlife species of conservation concern and the habitats they depend on, the Wildlife Protection and Nature Reserve Establishment Program has a focus on protecting wetlands, typical natural ecosystems and ecologically fragile zones. Thirteen groups of animal species and two groups of plant species have been selected as specific foci of the program.

All three of the above government programs present potential sources of support for biodiversity conservation in the region, particularly the establishment and maintenance of habitat corridors between key biodiversity areas and enhancing the integrity and connectivity of conservation corridors. Civil society is often well placed to leverage such support, due to its access to information on the location of important sites for conservation. This may represent an important opportunity for CEPF support to civil society in the region.

Lao P.D.R.

During the 1990s, Lao P.D.R. experienced a boom in conservation investment, with a number of major initiatives, including the Lao-Swedish Forestry Program, funded by the Swedish International Development Agency (SIDA), and the World Bank "Forest Management and Conservation Project," which included a GEF-funded wildlife and protected areas conservation component. Large investments were made at certain national protected areas, typically following the integrated conservation and development project (ICDP) approach. In addition, there were significant investments in biodiversity surveys and conservation investment, resulting in baseline data being gathered for almost all national protected areas in the country. Furthermore, there were significant investments in conservation planning, particularly for the national protected area system. Lao P.D.R. has an indicative allocation of $5.2 million under the RAF.

In recent years, however, there has been a substantial decrease in conservation investment in Lao P.D.R. by international donors. This reduction in international conservation investment has taken place at a time when the government institutions responsible for biodiversity conservation, most notably MAFF, have undergone major restructuring, with many staff previously responsible for conservation now allocated to other duties. As a result, government capacity to effectively manage the national protected area network and protect wildlife populations has been affected. Relative to other countries in the region, few international conservation organizations are active in Lao P.D.R.; and only IUCN, WCS and WWF maintain a permanent presence there.

While current levels of conservation investment in Lao P.D.R. are lower than previously, there remain a number of significant investments. Several projects are focused on building national capacity in protected area management, such as the “Nam Ha National Protected Area Strengthening Project” currently being implemented by WCS. Other projects are focused on promoting sustainable management of natural resources, for

example The Netherlands government-funded “Sustainable Utilization of Non-Timber Forest Products (NTFPs) Project, Phase II,” being implemented by IUCN. There are also a number of species-focused initiatives, usually with small budgets, such as the “Eld's Deer Conservation Project” being implemented by the Smithsonian Institution and WCS. Another significant investment is the “Integrated Ecosystem and Wildlife Management Project in Bolikhamxay Province,” funded by GEF through the World Bank.

Thailand

Overall levels of conservation investment have been comparable with those of Cambodia, Lao P.D.R. and Vietnam historically. This may change however as Thailand ratified the Convention on Biological Diversity in October 2003, and is now eligible for GEF funding for the first time. Under the RAF, Thailand has an indicative allocation of $9.2 million under GEF4. UNEP supported implementation of the CBD, through such initiatives as the "Thailand Biodiversity Country Study" and the "Biodiversity Data Management Project." Danish Cooperation on Environment and Development (DANCED) has also funded a number of projects in support of the implementation of the CBD.

Several multilateral and bilateral agencies have made major investments in biodiversity conservation in Thailand over the last decade. The EU has a programmatic focus on environmental protection and stimulating the rural economy. Conservation investments by the Canadian International Development Agency (CIDA) have concentrated on rehabilitation of natural habitats, such as the restoration of forests of cultural importance in Maha Sarakam province, and the conservation of particular elements of biodiversity, such as the "ASEAN Forest Tree Seed Centre Project." Investments by UNDP are concentrated on sustainable natural resource use, for instance the "National Strategy for Sustainable Development Project" (Bugna and Rambaldi 2001). In addition to multilateral and bilateral donor agencies, a number of international NGOs fund conservation projects in Thailand, either fully or with co-financing from other donors. These NGOs include WWF-Thailand, its partner organizations around the world, and CARE Thailand.

Despite the relatively advanced development of the Thai economy compared with several other countries in Indochina, inadequate budgets are a major limitation to government institutions responsible for biodiversity conservation. Only a small proportion of the national budget allocated for natural resources management is used for biodiversity conservation. For instance, in 1995, management of the national protected area system accounted for just 1.2 percent of the former Royal Forest Department's total budget of $2.86 billion (Kaosa-ard 1995). In large part, the low levels of government conservation investment reflect the low priority given to biological conservation compared with economic development.

One area in which Thailand receives greater conservation investment from the national government than most other countries in the region is biodiversity-related research. Since 1996, the Thailand Research Fund, in cooperation with the National Centre for Genetic Engineering and Biotechnology, has implemented the Biodiversity Research and Training

(BRT) Program. The program funds projects to strengthen the capacity of researchers, university students, teachers, NGOs, and others in biodiversity-related work, and supports them to raise public awareness of the values of biodiversity and the need to cooperate in its conservation. It supports around 30 biodiversity research projects annually, with a total budget of around $1 million. Research projects funded by the program have included plant taxonomic studies, studies on the relationships among biodiversity, social activities and traditional knowledge, and studies on the economics of natural resource use by local communities.

Vietnam

In excess of $115 million has been invested into biodiversity conservation in Vietnam since 1995. Donors active in their support of biodiversity conservation in the country include Danida, the EU, the MacArthur Foundation, The Netherlands government, UNDP, the World Bank, and various branches of WWF. A large proportion of the conservation investment in the country has come from the GEF, through either UNDP or the World Bank. Vietnam has an indicative allocation of $10.2 million under the GEF RAF. Most conservation investment has been in the form of grants, for projects implemented by government institutions. However, a significant proportion of the conservation investment has been in the form of grants to international conservation organizations and, to a much lesser degree, national NGOs.

The majority of conservation investment in Vietnam has been in site-based initiatives, typically following the ICDP approach. The largest investment at a single site is the EU-funded "Social Forestry and Nature Conservation in Nghe An Province Project," centered on Pu Mat National Park, which has a total budget of $19 million. Other major site-based initiatives are the UNDP/GEF-funded "Creating Protected Areas for Resource Conservation using Landscape Ecology Project" at Yok Don and Ba Be National Parks and Na Hang Nature Reserve, which has a total budget of $8.5 million, The Netherlands government-funded "Cat Tien National Park Conservation Project," which has a total budget of $6.3 million and the World Bank-funded "Forest Protection and Rural Development Project" at Cat Tien and Mom Ray national parks, which is co-financed by The Netherlands government and has a total budget of $32.3 million. KfW Development Bank recently undertook a feasibility study to support Phong Nha Ke Bang National Park.

Other significant investments have been made by international donors in a range of small and medium-sized projects implemented by international and national NGOs, academic institutions and government institutions. For example, the MacArthur Foundation recently invested $1.64 million across seven projects in the Annamite Mountains, broadly focusing on biodiversity resources management within and outside protected areas, and capacity building to assist conservation planning.

The Government of Vietnam makes significant investments in the national protected area system, although these investments are heavily skewed to a small number of sites. Consequently, while a small group of national parks enjoyed funding levels per square kilometer comparable with protected areas in developed countries, the vast majority of

protected areas continue to face severe financial constraints (IUCN 2002b). Even at protected areas with high overall levels of funding, much of that funding is skewed toward infrastructure development and ample evidence exists to demonstrate that on-the-ground conservation management activities are under-resourced, equipment is scarce, management capacity and effectiveness are very low and there are limited expenditures on operations and maintenance.

The most significant current development in conservation financing in Vietnam is the development of the $75 million "Forest Sector Development Project (FSDP)," with support from the World Bank. One component of this project, funded by a GEF grant, is the establishment of the Vietnam Conservation Fund (VCF). The VCF provides small-grant support to protected areas of international biodiversity importance on a competitive basis. It is envisioned that, in the first 5 years of operation, the VCF will disburse around $7 million in grants to more than 30 protected areas, with around $5 million of technical assistance through co-financing by The Netherlands government and other donors. The objective of the VCF is to provide funding for operational costs, which are not adequately covered by existing government investments.

Regional Conservation Initiatives

There are relatively few regional conservation initiatives in Indochina, although there are several new and promising regional projects now underway One important initiative is the ASEAN Regional Centre for Biodiversity Conservation (ARCBC), a collaboration between the EU and ASEAN. The aim of ARCBC is to build a foundation of shared expertise, information and experience to support biodiversity conservation in the ASEAN region. Activities of ARCBC have included preparation of local-language training manuals and development of a biodiversity conservation database for the region. The first phase of ARCBC is from 1999 to 2004, with Euro 8.5 million in funding from the EU and substantial co-financing from ASEAN governments.

Another major regional conservation initiative is the Mekong River Basin Wetland Biodiversity Conservation and Sustainable Use Program, Phase I. This program is implemented by IUCN and the Mekong River Commission (MRC) in Cambodia, Lao P.D.R., Thailand and Vietnam, with $32 million in funding from various donors, including GEF (through UNDP), the four national governments, The Netherlands government, UNDP, MRC and IUCN. The objectives of the program are to establish multi-sectoral planning at national and regional levels, strengthen macroeconomic and policy frameworks for wetlands biodiversity conservation and sustainable use, build human and technical capacity for wetland management, and improve community-based natural resources management within wetlands.

One significant transboundary initiative, albeit at a very preliminary stage, is the "Tenasserim Transboundary Conservation Project." The governments of Thailand and Myanmar are exploring possibilities to link Kaeng Krachan National Park with the Western Forest Complex, via a habitat corridor in southern Myanmar.

ADB is administering the Greater Mekong Subregion Core Environment Program (CEP) and its Biodiversity Conservation Corridors Initiative has identified nine priority biodiversity conservative landscapes and plans to collaborate with Birdlife, CI, WWF, and WCS, among others in implementing projects at pilot sites within these corridors. The CEP has a budget of more than $36 million financed in large part through grants from the Netherlands and Sweden.

Thematic Distribution of Investment

Site-Based Conservation: Protected Areas

Conservation investment in Indochina by both national governments and international donors has been heavily focused on site-based conservation. In particular, there has been significant investment in protected areas in most countries in the region. Some individual protected areas have received large amounts of investment, such as the $19 million EU-funded project at Pu Mat National Park in Vietnam and the $5 million World Bank/GEF-funded "Biodiversity and Protected Area Management Pilot Project" at Virachey National Park in Cambodia. In general, government and donor commitment to protected areas remains strong in the region, as evidenced by the number of major planned initiatives, such as the VCF component of the FSDP in Vietnam that aims to provide regular small-grant support for operational management at priority protected areas.

An assumption that dependence on natural resources among rural communities is a major factor contributing to biodiversity loss at sites, coupled with donor and government agendas to promote poverty alleviation, has led to a heavy focus on ICDP approaches throughout the region, for example the Danida-funded "U Minh Thuong Nature Reserve Conservation and Community Development Project" in Vietnam. While this assumption may be correct at some sites, the relationship between rural poverty and biodiversity loss is typically more complicated, as it is often the richer households who have the manpower, time and capital to exploit natural resources, and the access to markets to sell them. In addition, ICDP approaches can fail to address threats to biodiversity operating at a higher level, for example infrastructure development and human resettlement. A review of ICDPs in Vietnam, conducted in 2001, concluded that although these projects have been widely promoted by international conservation organizations and donors, their performance has generally been poor because the approach has been inappropriate for addressing the major causes of biodiversity loss and have had little lasting impact (Sage and Nguyen Cu 2001).

The approaches to site-based conservation that appear to be meeting with the greatest success in Indochina are those where the emphasis has been placed on strengthening the capacity of protected area staff to enforce management regulations and generating understanding among local people of the values and benefits of protected area, rather than promoting rural development for local communities. For example, a review of lessons learned in protected area management in Thailand by Srikosamatara and Brockelman (2002) concluded that, although there is no single recipe for solving the diverse problems facing protected areas in the country, most solutions fall into two general categories: convincing people that protected areas are needed and valuable; and enforcing laws to

prevent overexploitation of the resources within them. However, notwithstanding a few notable exceptions, there has been little willingness by governments and donors to invest in capacity building for effective enforcement of protected area management regulations.

As well as investments at individual protected areas, there have also been significant investments in protected areas planning. In Lao P.D.R., the Lao-Swedish Forestry Program has conducted a review and evaluation of the national protected area system (Robichaud *et al.* 2001). In Vietnam, a major EU-funded project implemented by BirdLife International provided technical support for the expansion of the national protected area system, while the Danida-funded "Strengthening Protected Area Management Project," implemented by WWF and the FPD of MARD, focused on reviewing the legislative and management framework. Finally, CIDA financed a policy study on sustainable management of nature reserves in China. While gaps exist in the protected area systems of all countries in the region, particularly with regard to wetland and marine ecosystems, the existing systems provide an appropriate framework for conservation action for most ecosystems. Therefore, except in the case of certain ecosystems, the main emphasis of future conservation investment should be on strengthening the management of existing protected area networks, not making further revisions to them.

Site-based Conservation: Wetlands

As mentioned previously, wetland ecosystems are generally poorly represented within national protected area systems. In part, this reflects unclear institutional responsibilities for wetland management in some countries, and, in part, it reflects the inappropriateness of formal protected area approaches to the conservation of ecosystems that are subject to high levels of human use and dependence. Consequently, a significant proportion of investment in wetland conservation has focused outside of formal protected areas. Major investments in the region to date include a National Inventory of Natural Wetlands in Thailand, supported by DANCED; the "Inventory and Management of Cambodian Wetlands Project," implemented by the Royal Government of Cambodia, with support from MRC and Danida; the National Wetlands Conservation Program in Vietnam, supported by The Netherlands government; the Coastal Wetlands Development and Protection Project in Vietnam, supported by the World Bank; and the "Wetland Biodiversity Conservation and Sustainable Use in China Project," funded by the GEF, through UNDP, with co-financing from the governments of China and Australia.

The traditional view that wetlands are "wasted land" is being rapidly changed in the light of the growing number of studies demonstrating the huge value of wetland products and services to the rural poor and to national economies (e.g. Emerton 1999). However, despite this changing view, threats to and loss of wetland ecosystems continue to increase, and the conservation of biodiversity within wetland ecosystems remains a major funding gap.

The main focus of conservation investment on wetlands to date has been non-flowing freshwater freshwater wetlands. Biodiversity conservation in riverine systems and coastal wetlands is greatly under-funded, although these ecosystems do receive significant

funding for other objectives, some of which are inconsistent with biodiversity conservation, such as initiatives to afforest intertidal mudflats with mangrove (Erftermeijer and Lewis 1999, Yu and Swennen 2001). One initiative addressing riverine biodiversity conservation issues is the Living Mekong Initiative of WWF, which is mainly focused at the policy level, for example in relation to dam developments.

Site-based Conservation: Marine

In addition to wetlands, marine ecosystems are the other major gap in protected area systems in the region, although they are relatively well represented within marine national parks in Thailand. Marine ecosystems have received significant amounts of conservation investment in Thailand and Vietnam, although much less so in Cambodia and southern China (Lao P.D.R. having no coastline). Major investments in marine biodiversity conservation include: the "Model Marine National Park Management Project" in Thailand, funded by DANCED; the "Support to the Marine Protected Area Network in Vietnam Project" funded by Danida; the "Sustainable Use of Coastal and Marine Resources in the Con Dao Islands Region Project" in Vietnam, funded by the GEF through UNDP; and the "Hon Mun Marine Protected Area Pilot Project" in Vietnam, funded by the GEF through the World Bank, and Danida. Conservation investment in marine biodiversity conservation remains a major funding gap in Cambodia and southern China, although, as marine ecosystems are not included in Indochina, they will not be eligible for support from CEPF.

Site-based Conservation: Local, Stakeholder-based Approaches

In addition to formal protected area approaches to conservation, there have been small amounts of investment in local, stakeholder-based approaches to site-based conservation. This investment has led to the establishment of a number of pilot local, stakeholder-based conservation groups in the region. These groups have proven to be a very cost-effective means of engaging local stakeholders in conservation of key sites, particularly in contexts where there are limitations to the effectiveness and potential sustainability of formal protected area approaches. Examples of projects supporting local, stakeholder-based approaches include: the Danida-funded "Community Participation for Conservation in Cambodia Project"; a MacArthur-funded project to conserve biodiversity outside of protected areas in Vietnam and Cambodia by strengthening local level conservation management; and several projects at key sites for primate conservation in northern Vietnam supported by USFWS, the Margot Marsh Foundation and other donors.

As with any approach to conservation, local, stakeholder-based approaches are not appropriate in every situation. For example, community-based conservation has not been effective at most Thai protected areas because protected area management regulations strictly prohibit exploitation of natural resources, there are often no significant sources of forest products outside of protected areas, and many hunters are outsiders or recent in-migrants who lack roots in the area (Srikosamatara and Brockelman 2002). Similarly, experience from Vietnam suggests that local, stakeholder-based approaches are most effective in situations where sustainable exploitation of certain forest products is permitted or tolerated, sufficient resources are available to meet local people's subsistence needs, and the principle source of threats to key elements of biodiversity are local people not outsiders.

Local, stakeholder-based approaches have high potential to establish low-cost, sustainable structures for conservation at certain key biodiversity areas in the region, particularly those where formal protected area approaches may be unfeasible or inappropriate, such as many freshwater and coastal wetlands. However, significant additional conservation investment is required if existing pilot initiatives are to be consolidated, lessons learned are to be documented, best practice guidelines are to be developed, and successful initiatives are to be replicated elsewhere.

Landscape-scale Conservation

A current trend in conservation in Indochina is a shift toward landscape-scale approaches: initiatives working at levels higher than that of individual sites and building broad constituencies of support for landscape-scale conservation plans. Such approaches have three main advantages over site-based approaches. First, they are more appropriate for addressing the conservation needs of landscape species, which often cannot be conserved at isolated sites indefinitely. Second, by integrating biodiversity considerations into the policies and programs of other sectors, including infrastructure, forestry and energy, they can mitigate threats that cannot be addressed at the site level. Third, such approaches can leverage additional resources for biodiversity conservation from sources other than traditional donors. For example, the Return Slope Farmland to Forests and Natural Forests Protection Programs in China present great opportunities to leverage resources for habitat restoration, linking key biodiversity areas and strengthening the integrity of conservation corridors.

A number of conservation corridors in the region are the focus of ongoing landscape-scale conservation initiatives, including: the Northern Plains Dry Forests, which is the focus of the forthcoming "Establishing Conservation Areas through Landscape Management in the Northern Plains of Cambodia Project," funded by the GEF through UNDP; and the Central Annamites, which is the focus of the WWF-coordinated Central Annamites Initiative, a suite of coordinated investments with funding from various sources. However, many of the other conservation corridors in Indochina would benefit significantly from additional investments in landscape-scale conservation, including all three priority corridors. This represents a major funding opportunity for CEPF.

Species-focused Conservation

Very little conservation investment in Indochina has been in species-focused conservation. Many stakeholders reported this is the area for which it is hardest to raise funds. The lack of funding for species-focused conservation activities has been compounded by a strong emphasis of available funding sources on high-profile species, particularly large mammals. For example, WWF, the Thai Elephants Conservation Centre, the Forest Industry Organization and the Bureau of the Royal Household supported the "Asian Elephant Re-introduction and Conservation Project" in Thailand, while the French GEF plans to support site-based action for banteng and gaur at four protected areas in Vietnam. Even for high profile, large mammals, however, existing sources of funding are insufficient to meet their conservation needs.

Available funding for species-focused conservation action is mainly limited to small grants from sources such as the BP Conservation Program, the Cat Action Treasury (CAT), the Oriental Bird Club, the Rufford Small Grant Scheme, the Save the Tiger Fund and USFWS. For example, the Oriental Bird Club has recently supported a study on the status and ecology of rufous-necked hornbill at Che Tao IBA in Vietnam; CAT recently supported a study on the ecology and conservation of the felid community at Phu Khieo Wildlife Sanctuary, Thailand; and USFWS is supporting a project to conserve black crested gibbon (*Nomascus concolor)* in Lao P.D.R. through field studies and raising public awareness.

The one country with significant funding opportunities for species-focused research is Thailand, where the BRT Program has been established, with funding from the Thailand Research Fund and the National Centre for Genetic Engineering and Biotechnology, to support applied biodiversity research. However, as in the rest of the region, funding opportunities to support species-focused conservation actions other than research are very limited.

Wildlife Trade

In addition to investment in species-focused conservation action for individual species, there has also been some investment in national and regional initiatives to combat illegal and unsustainable trade in wildlife and wildlife products, which represents one of the major underlying threats to globally threatened species in the region. In Lao P.D.R., USAID has supported a project to provide technical assistance to combat the illegal wildlife trade. In Thailand, DANCED is funding a WWF wildlife trade campaign. In Vietnam, Danida is funding a project to strengthen the implementation of CITES. In Cambodia, WildAid has entered into an agreement with the Wildlife Protection Office to create the Wilderness Protection Mobile Unit, a special law enforcement team dedicated to fighting illegal wildlife trade throughout the country. Furthermore, efforts to combat illegal wildlife trade have been supported by the preparation of local-language field guides of key trade species in Cambodia, Lao P.D.R., Thailand, and Vietnam, with support from the World Bank.

In addition to investment in tackling the unsustainable trade in wildlife in the region, there has been a limited amount of investment in changing consumer attitudes toward wildlife and wildlife products. For instance, the Asian Conservation Awareness Program of WildAid uses social marketing and mass media advertisements featuring top Asian celebrities to promote reduction in consumption of threatened species among urban populations. The program reaches millions of people per week at a cost of less than $100,000 per year. Such public awareness campaigns represent a cost-effective opportunity for civil society to tackle the issue of wildlife trade through addressing the root cause: demand. Due to low motivation and political will, corruption and other obstacles, achieving similar reductions in wildlife trade through strengthened enforcement of prohibitions on transport and sale of wildlife would, arguably, require significantly greater resources. Consequently, activities to reduce demand represent a key opportunity for CEPF to address the issue of wildlife trade in the region.

Sustainable Use of Natural Resources

A significant amount of conservation investment in the region has focused on developing models for sustainable use of natural resources, particularly at a local level by rural communities. Examples include two consecutive, projects funded by the Dutch government that focused on sustainable utilisation of non-timber forest product projects in Lao P.D.R. and Vietnam, and several pilot sustainable use initiatives in Thailand supported by the Royal Project Foundation. This emphasis on sustainable use of natural resources reflects the poverty alleviation agendas of national governments and donor agencies, and the assumption that poverty reduction in rural communities will bring biodiversity conservation benefits. Most projects, however, have focused on species that are not globally threatened. While there is a need to develop models for sustainable use of certain globally threatened species threatened by overexploitation, there are arguably sufficient appropriate funding sources to support such activities. Consequently, while studies and models of sustainable use may be an urgent conservation action for some globally threatened species, they are not the highest priority for CEPF funding.

Environmental Education and Awareness Raising

Environmental education and awareness-raising activities are receiving significant amounts of conservation investment, both as stand-alone projects and as components of larger projects. In particular, many site-based conservation projects include an education and awareness component. Many initiatives are focused on specific areas or at particular sites, such as the EU-funded "Capacity Building to Support Training and Education on Coastal Biodiversity in Ranong Province Project" in Thailand. Other initiatives are focused on particular themes or target groups, such as the USAID-funded "Environmental Education and Community Participation Curriculum for Forest Rangers Project" in Vietnam. Finally, some initiatives are nationwide in scope, such as the Danida and UNDP-funded "Environmental Education in the Schools of Vietnam Project." While many civil society organizations active in the region reported that funding opportunities for education and awareness raising are relatively good, there are a number of niches where additional funding from CEPF could make a significant difference, such as raising awareness among decisionmakers to build their support for conservation initiatives.

Geographic Distribution of Investment

There are a number of clear trends regarding the geographic distribution of conservation investment in Indochina. Most notably, there is relatively little investment in biodiversity conservation in coastal, riverine, lowland evergreen forest, and northern Vietnam forest ecosystems. This may partly reflect reluctance on the part of governments and donors to invest in conservation in ecosystems that are under heavy pressure from human populations, and where there is a perceived large opportunity cost of biodiversity conservation in terms of foregone economic opportunities, such as timber extraction, land conversion, and aquaculture development. Moreover, at least in the case of the former two ecosystems, it may possibly reflect a lack of appreciation of their biodiversity values.

CEPF NICHE FOR INVESTMENT

The CEPF niche for investment in Indochina has been formulated through an inclusive, participatory process that engaged civil society, donor, and government stakeholders

throughout the region. Given the very significant investments already being made in biodiversity conservation by international donors and national governments, the relatively limited additional resources available from CEPF can be used most effectively in support of civil society initiatives that complement and better target these existing investments. To maximize the impact of CEPF funding, actions that are very urgent but require large amounts of funding will be excluded in favor of actions that are cost effective and/or present opportunities to leverage significant additional resources from other sources. At the same time, attention will be given to activities that can contribute to protection of the assets of the rural poor, while addressing biodiversity conservation issues. The basic premise underlying the CEPF niche is that conservation investment should be targeted where it can have the maximum impact on the highest conservation priorities, while supporting the livelihoods of some of the poorest sections of society.

Throughout the region, responsibility for managing natural habitats and species' populations lies primarily with national governments, which, together with international donors, are investing significant resources in biodiversity conservation. However, these investments are not always effective at conserving global biodiversity, and, by implication, supporting the livelihoods of local people who depend upon natural resources, because they are often incorrectly targeted, fail to address the causes of biodiversity loss, or are undermined by incompatible plans and policies of other sectors. For instance, most site-based investment has targeted protected areas, overlooking many key sites for conservation outside of protected area networks where opportunities for successful conservation can be at least as great. Similarly, there has been a heavy emphasis on ICDP approaches, despite the fact that these have had few demonstrable impacts on threats to biodiversity in the region. Given the significant investments already being made, relatively small, highly focused investments to target existing investments better and to develop examples of best practice and alternative approaches will be a more effective use of CEPF funding than a few larger investments that replicate approaches already being widely implemented.

To this end, CEPF will support civil society to mainstream biodiversity into other sectors, thereby addressing some of the major underlying causes of biodiversity loss and leveraging additional resources for conservation. In addition, CEPF will support civil society to develop and disseminate best practice models for controlling overexploitation, one of the major threats to globally threatened species in the region, and for engaging local stakeholders in conservation, thereby presenting alternatives to formal protected area approaches with greater potential to address the livelihood needs of local people. Furthermore, CEPF will support civil society to take action for globally threatened species to attract additional resources for their conservation and ensure that these resources are targeted effectively.

To ensure the greatest incremental contribution to the conservation of the global biodiversity values of Indochina, CEPF investment will be focused within two priority corridors, containing 28 priority sites. These priority corridors and sites all support biodiversity of global importance, including large numbers of globally threatened and endemic species, and are, therefore, globally irreplaceable. The unique biodiversity

values of the priority corridors and sites face a range of threats, including incompatible development initiatives and overexploitation, and they are all urgent priorities for conservation action. Nevertheless, the priority corridors and sites all have a high potential for conservation success, and all present excellent opportunities for CEPF investments in conservation actions by civil society to complement or better target other investments by donors and governments.

In addition to site-based and landscape-scale conservation action within the two priority corridors, CEPF investment will also be made available for species-focused conservation action. This is a huge funding gap, and presents a great opportunity for CEPF to make a major impact in one of the most important regions in the world for the conservation of globally threatened species. A total of 67 priority species will be eligible for CEPF funding, as will all globally threatened plant species and selected freshwater taxa. *As most of these species have common conservation needs, however, it will not be necessary for CEPF to make separate investments for each one. Rather, in many cases, a single initiative could address the conservation needs of a group of species.*

CEPF INVESTMENT STRATEGY AND PROGRAM FOCUS

To maximize CEPF's contribution to the goal of global biodiversity conservation within Indochina over a five-year investment period, it was necessary to refine the full list of globally threatened species, key biodiversity areas, and conservation corridors defined for Indochina into a focused set of priority outcomes for CEPF investment (priority species, sites, and corridors). The purpose of selecting priority sites and corridors is to enable CEPF investment in site-based and landscape-scale conservation actions to focus on geographic areas (particularly sites) of the highest priority, while the purpose of selecting priority species was to enable CEPF investment in species-focused conservation actions to be directed at those globally threatened species whose conservation needs cannot be adequately addressed by site-based and landscape-scale conservation actions alone.

Criteria for selecting priority species from among the full list of globally threatened species in the region included significance of the Indochina population relative to the global population (only Vulnerable species with at least 10 percent of their global population in Indochina, Endangered species with at least 5 percent, and Critically Endangered species with at least 1 percent were considered for selection), need for species-focused conservation action (globally threatened species whose conservation needs cannot be adequately addressed by site-based and landscape-scale conservation actions alone were considered) and need for greatly improved information on status and distribution in Indochina (globally threatened species with an over-riding need for greatly improved information before conservation action can be taken in any meaningful way were considered). The application of the selection criteria to the globally threatened species in Indochina is presented in Appendix 1.

Criteria for selecting priority sites from among the full list of key biodiversity areas in the region included occurrence within a priority corridor (only key biodiversity areas occurring within a priority corridor were considered). The application of the selection criteria to the key biodiversity areas in Indochina is presented in Appendix 2.

A number of criteria were used to select priority corridors from among the full list of conservation corridors in the region, including importance for globally threatened species (only conservation corridors supporting globally significant populations of Critically Endangered and Endangered species were considered), importance for the conservation of landscape species (preference was given to conservation corridors supporting globally significant populations of one or more landscape species), and importance for the conservation of ecological and evolutionary processes (preference was given to conservation corridors supporting unique or exceptional examples of ecological and evolutionary processes). The application of the selection criteria to the conservation corridors in Indochina is presented in Appendix 3.

For all priority outcomes for CEPF investment, the most important selection criteria were urgency for conservation action and opportunity for additional investment. Priority species, sites, and corridors were only selected where current threats, if not mitigated, were predicted to cause their extinction (in the case of species) or the loss of key elements of biodiversity (in the case of sites and corridors) within the next 20 years. In addition, priority species, sites, and corridors were only selected where there were considered to be very great opportunities for CEPF investments in conservation actions by civil society to complement or better target other investments by donors or governments.

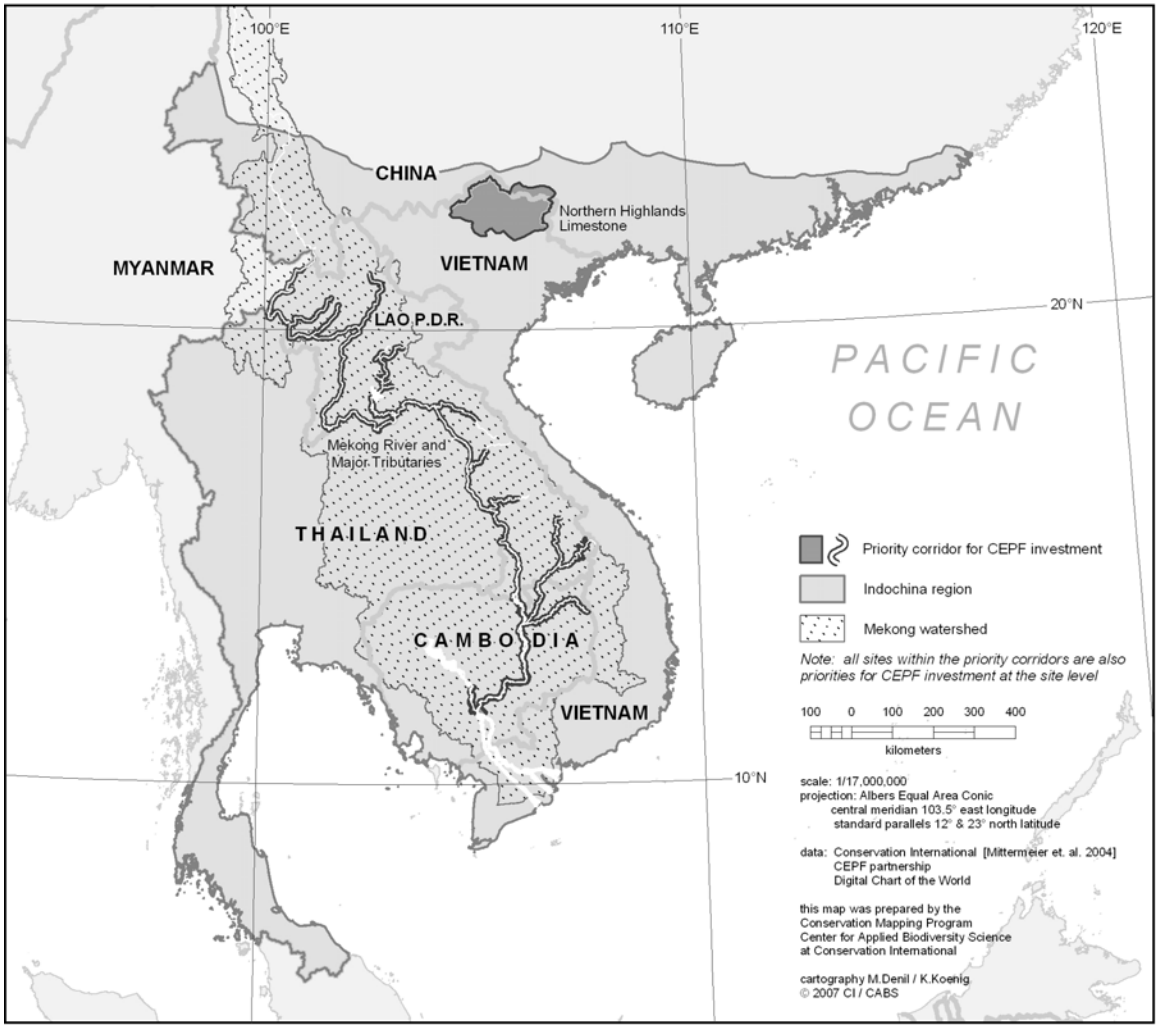
Preliminary lists of priority species, sites, and corridors for CEPF investment in Indochina were proposed at the series of expert roundtables attended by more than 120 representatives of national and international conservation organizations, academic institutions, donor agencies, and government institutions in the region. These lists were then synthesized and reviewed, through reference to published and unpublished data and further consultations with in-region stakeholders. A draft ecosystem profile was discussed at a meeting of the CEPF Working Group held in Washington D.C. in December 2003. During and following this meeting, the ecosystem profiling team received valuable feedback from representatives of the CEPF donor partners. Concerns were raised regarding the geographic scope of the CEPF investment niche. In particular, there was a concern that the number of priority corridors proposed was too great, relative to the amount of funding potentially available, with the associated risk that CEPF investment could be spread too thinly to have a measurable impact.

Taking the feedback from the CEPF Working Group into consideration, the ecosystem profiling team prepared a revised draft. This revised drafted differed from the 19 November 2003 draft in having a much more tightly focused geographic niche, with six priority corridors and 51 priority sites. The revised draft of the ecosystem profile was presented at a meeting between CEPF and World Bank staff held in Medan, Sumatra, in June 2005. At this meeting, additional verbal feedback was provided by World Bank staff, particularly in relation to the CEPF investment niche. Concerns were expressed that opportunities for conservation success in some of the proposed priority corridors (including Hainan Mountains and the Inner Gulf of Thailand) were limited, and that the potential for synergies between future CEPF investments and World Bank sectoral investments would not be fully realized.

In response to this feedback and subsequent discussion with the CEPF donor partners, further revisions were made to the investment strategy. The final investment strategy targets two priority corridors and the 28 priority sites they contain (Figure 3 and Table 8). The two priority corridors cover a total area of 41,547 km^2 and include 28 key biodiversity areas, equivalent to 8 percent of the full list for Indochina. All of these key biodiversity areas were selected as priority sites.

Explicit provisions are included for supporting initiatives outside of these geographic priorities, particularly where they present opportunities to engage civil society in major sectoral projects and programs.

Figure 3. Priority Corridors for CEPF Investment in Indochina



As developed through the stakeholder consultation process, the Mekong River and Major Tributaries Corridor does not include the Mekong Delta Wetlands downstream from Phnom Penh.

Table 8. Priority Corridors and Priority Sites for CEPF Investment in Indochina

Priority corridor	Priority sites	Countries	Area (km^2)
Mekong River and Major Tributaries	Basset Marsh; Boeung Veal Samnap; Mekong Channel near Pakchom; Mekong from Kratie to Lao P.D.R.; Mekong from Phou Xiang Thong to Siphandon; Mekong upstream of Vientiane; Sekong River; Sesan River; Siphandon; Upper Lao Mekong; Upper Xe Khaman	Cambodia, Lao P.D.R., S. China and Thailand	17,070
Northern Highlands Limestone	Ba Be; Ban Bung; Ban Thi-Xuan Lac; Binh An; Cham Chu; Diding; Dong Phuc; Du Gia; Gulongshan; Kim Hy; Na Chi; Nongxin; Sinh Long; Tat Ke; Tay Con Linh; Thanh Hen Lake; Trung Khanh	S. China and Vietnam	24,477

The key biodiversity values of the priority corridors are briefly summarized below:

Priority Corridor 1 - Northern Highlands Limestone. The Northern Highlands Limestone corridor is particularly important for the conservation of primates, as it supports the entire global population of the Critically Endangered Tonkin snub-nosed monkey and the world's largest remaining population of eastern black crested gibbon (*Nomascus concolor nasutus)*, which is widely recognized as a separate Critically Endangered species. The corridor is also of high global importance for plant conservation, supporting high levels of endemism in many groups, such as orchids. The corridor supports the richest assemblages of conifer species in the region, including several globally threatened species, such as *Amentotaxus yunnanensis*, *Cephalotaxus mannii* and *Cunninghamia konishii*. Most notably, the corridor supports two conifer species with known global ranges restricted to a single site: *Xanthocyparis vietnamensis* and *Amentotaxus hatuyenensis*[4]. Through a land-use history of commercial logging and shifting cultivation, the natural habitats of the Northern Highlands Limestone corridor (limestone, lowland evergreen and montane evergreen forest) have become fragmented, in places highly, and remaining blocks are often threatened by overexploitation of forest products. Nevertheless, the corridor presents tremendous opportunities to engage civil society groups in biodiversity conservation. Many of the most important populations of threatened and endemic species occur outside of formal protected areas, in sites that lend themselves to community-based conservation approaches. Furthermore, many key biodiversity areas are threatened by incompatible development initiatives, and there is an important role for civil society to play in reconciling conservation and development agendas in the corridor.

Priority Corridor 2 - Mekong River and Major Tributaries. Partly as a result of a limited appreciation of their biodiversity values among decisionmakers, riverine

[4] *Xanthocyparis vietnamensis* and *Amentotaxus hatuyenensis* are both recently described species, which are evaluated as Critically Endangered and Endangered, respectively by IUCN (2004).

ecosystems have, to date, received less conservation investment than most other ecosystems in Indochina, and are severely under-represented within national protected area systems. The Mekong River and its major tributaries, including the Srepok, Sesan, and Sekong rivers, represent the best remaining examples of the riverine ecosystems of Indochina. The biodiversity values of these rivers have yet to be fully evaluated, particularly as global threat assessments have only been conducted for a small fraction of the freshwater species that occur in them. However, the corridor is known to be important for a number of giant fish, including the Critically Endangered leaping barb and freshwater sawfish, and the Endangered giant catfish, Mekong freshwater stingray, and Jullien's golden carp. The corridor also supports significant populations of a number of aquatic turtle species, including the Endangered Asian giant softshell turtle (*Pelochelys cantorii)*. Furthermore, the Mekong River and its major tributaries support the fullest riverine bird communities remaining in Indochina, including globally significant congregations of species such as river lapwing (*Vanellus duvaucelii)* and small pratincole (*Glareola lacteal)*. Because of these values, one section of the corridor has been designated as a Ramsar site. CEPF investment in the Mekong watershed will focus on the Mekong River and its major tributaries as defined by the stakeholder consultation process. Projects funded under Strategic Direction 3 can be implemented within or beyond the defined corridor, but must contribute to the conservation of priority species or sites within the corridor as specified in the ecosystem profile.

A total of 67 globally threatened animal species were selected as priority species, representing 27 percent of the full list of globally threatened animal species in Indochina (Table 9). The priority species include seven primate species endemic to the region, eight carnivore species, and 20 turtle species, reflecting the high threat posed to these groups by overexploitation, often driven by demand from the wildlife trade. The priority species also include seven large and medium-sized waterbird species, which are either dispersed breeders or colonial breeders that disperse widely during the non-breeding season; these species require species-focused conservation action throughout their ranges in order to address overexploitation, disturbance and loss of key habitats. Furthermore, 12 priority species were selected because they have an over-riding need for greatly improved information on their status and distribution before conservation action can be taken for them in any meaningful way; nine of these species are Critically Endangered.

In addition to the priority species listed in Table 9, all 248 globally threatened plant species in Indochina are considered to be priorities for CEPF investment. The priority conservation action for the vast majority of globally threatened plant species in the region is research to establish their conservation status and distribution.

Table 9. Priority Species for CEPF Investment in Indochina*

Priority Species	Conservation Need(s) Requiring Species-Focused Action	Over-riding Need for Improved Information
MAMMALS		
Kouprey *Bos sauveli*		Yes
Wild Water Buffalo *Bubalus bubalis*	Control of overexploitation	
Asian Golden Cat *Catopuma temminckii*	Control of overexploitation	
Eld's Deer *Cervus eldii*	Control of overexploitation; active population management	
Otter Civet *Cynogale bennettii*		Yes
Hairy Rhinoceros *Dicerorhinus sumatrensis*	Control of overexploitation	
Asian Elephant *Elephas maximus*	Mitigation of human-elephant conflict; control of overexploitation	
Small-toothed Mole *Euroscaptor parvidens*		Yes
Smooth-coated Otter *Lutrogale perspicillata*	Control of overexploitation	
Clouded Leopard *Neofelis nebulosa*	Control of overexploitation	
Black Crested Gibbon *Nomascus concolor*	Control of overexploitation	
Wroughton's Free-tailed Bat *Otomops wroughtoni*		Yes
Tiger *Panthera tigris*	Control of overexploitation	
Vietnam Leaf-nosed Bat *Paracoelops megalotis*		Yes
Marbled Cat *Pardofelis marmorata*	Control of overexploitation	
Fishing Cat *Prionailurus viverrinus*	Control of overexploitation	
Saola *Pseudoryx nghetinhensis*	Control of overexploitation	
Red-shanked Douc (+ Grey-shanked) *Pygathrix nemaeus*	Control of overexploitation	
Black-shanked Douc *Pygathrix nigripes*	Control of overexploitation	
Lesser One-horned Rhinoceros *Rhinoceros sondaicus*	Control of overexploitation; active population management	
Tonkin Snub-nosed Monkey *Rhinopithecus avunculus*	Control of overexploitation	
Delacour's Leaf Monkey *Trachypithecus delacouri*	Control of overexploitation	
Francois's Leaf Monkey *Trachypithecus francoisi*	Control of overexploitation	
White-headed Leaf Monkey *Trachypithecus poliocephalus*	Control of overexploitation	
Chapa Pygmy Doormouse *Typhlomys chapaensis*		Yes
Asian Black Bear *Ursus thibetanus*	Control of overexploitation	
BIRDS		
White-winged Duck *Cairina scutulata*	Control of overexploitation	
White-eyed River-martin *Eurychelidon sirintarae*		Yes
White-eared Night-heron *Gorsachius magnificus*		Yes
Sarus Crane *Grus antigone*	Control of overexploitation	
White-rumped Vulture *Gyps bengalensis*	Provision of adequate food supply; control of persecution	
Slender-billed Vulture *Gyps tenuirostris*	Provision of adequate food supply; control of persecution	
Masked Finfoot *Heliopais personata*	Control of disturbance along waterways	

Priority Species	Conservation Need(s) Requiring Species-Focused Action	Over-riding Need for Improved Information
Greater Adjutant *Leptoptilos dubius*	Control of overexploitation	
Lesser Adjutant *Leptoptilos javanicus*	Control of overexploitation	
Green Peafowl *Pavo muticus*	Control of overexploitation	
White-shouldered Ibis *Pseudibis davisoni*	Control of overexploitation	
Giant Ibis *Thaumatibis gigantea*	Control of overexploitation	
REPTILES		
Asiatic Softshell Turtle *Amyda cartilaginea*	Control of overexploitation	
Painted Terrapin *Callagur borneoensis*	Control of overexploitation	
Red-necked Pond Turtle *Chinemys nigricans*	Control of overexploitation	Yes
Chinese Three-keeled Pond Turtle *Chinemys reevesii*	Control of overexploitation	
Striped Narrow-headed Softshell Turtle *Chitra chitra*	Control of overexploitation	
Siamese Crocodile *Crocodylus siamensis*	Control of overexploitation	
Indochinese Box Turtle *Cuora galbinifrons*	Control of overexploitation	
Chinese Three-striped Box Turtle *Cuora trifasciata*	Control of overexploitation	
Zhou's Box Turtle *Cuora zhoui*	Control of overexploitation	Yes
Black-breasted Leaf Turtle *Geoemyda spengleri*	Control of overexploitation	
Yellow-headed Temple Turtle *Hieremys annandalii*	Control of overexploitation	
Asian Giant Tortoise *Manouria emys*	Control of overexploitation	
Impressed Tortoise *Manouria impressa*	Control of overexploitation	
Vietnamese Pond Turtle *Mauremys annamensis*	Control of overexploitation	Yes
Asian Yellow Pond Turtle *Mauremys mutica*	Control of overexploitation	
Chinese Stripe-necked Turtle *Ocadia sinensis*	Control of overexploitation	
Wattle-necked Softshell Turtle *Palea steindachneri*	Control of overexploitation	
Asian Giant Softshell Turtle *Pelochelys cantorii*	Control of overexploitation	
East Asian Giant Softshell Turtle *Rafetus swinhoei*	Control of overexploitation	Yes
Beale's Eyed Turtle *Sacalia bealei*	Control of overexploitation	
Four-eyed Turtle *Sacalia quadriocellata*	Control of overexploitation	
FISH		
Mekong Freshwater Stingray *Dasyatis laosensis*	Control of overexploitation	
Giant Freshwater Stingray *Himantura chaophraya*	Control of overexploitation	
Marbled Freshwater Stingray *Himantura oxyrhynchus*	Control of overexploitation	
White-edged Freshwater Whipray *Himantura signifer*	Control of overexploitation	
Giant Catfish *Pangasianodon gigas*	Control of overexploitation	
Freshwater Sawfish *Pristis microdon*	Control of overexploitation	
Jullien's Golden Carp *Probarbus jullieni*	Control of overexploitation	
Laotian Shad *Tenualosa thibaudeaui*	Control of overexploitation	

See Appendix 1 for justification for selection of priority species.
Note: * = in addition to the species listed in the table, all 248 globally threatened plant species in Indochina are considered to be priorities for CEPF investment.

In addition to the above priority species, the participants at the expert roundtables identified 12 species and one group of species that, while not assessed as globally threatened, were considered to be of global conservation concern. These species were considered to potentially meet the selection criteria for priority species; in particular, they all require species-focused conservation action. They are, therefore, included on a list of provisional priority species, which could become eligible for CEPF investment if their global threat status is reassessed as globally threatened during the 5-year investment period (Appendix 4).

The CEPF investment strategy for Indochina comprises investment priorities grouped into four strategic directions, which are the results of an extensive process of consultation with civil society and government stakeholders. Draft investment priorities were formulated at the series of expert roundtables. The draft investment priorities were then synthesized by the ecosystem profiling team, reviewed in the context of current conservation investment in the region, and grouped into strategic directions. Finally, the synthesized strategic directions and investment priorities were circulated to in-region stakeholders and members of the CEPF Working Group for further input.

Table 10. Strategic Directions and Investment Priorities for CEPF in Indochina

CEPF Strategic Directions	CEPF Investment Priorities
1. Safeguard priority globally threatened species in Indochina by mitigating major threats	1.1 Identify and secure core populations of 67 globally threatened species from overexploitation and illegal trade
	1.2 Implement public awareness campaigns that reinforce existing wildlife trade policies and contribute to the reduction of consumer demand for 67 globally threatened species and their products
	1.3 Investigate the status and distribution of globally threatened plant species, and apply the results to planning, management, awareness raising and/or outreach
	1.4 Assess the global threat status of selected freshwater taxa and integrate the results into planning processes for the conservation of wetland biodiversity and development plans in the Mekong River and its major tributaries
	1.5 Conduct research on 12 globally threatened species for which there is a need for greatly improved information on their status and distribution
	1.6 Publish local-language reference materials on globally threatened species
2. Develop innovative, locally led approaches to site-based conservation at 28 key biodiversity areas	2.1 Establish innovative local stakeholder-based conservation management and caretaking initiatives at 28 key biodiversity areas
	2.2 Develop regional standards and programs that address overexploitation of biodiversity and pilot at selected sites
3. Engage key actors in reconciling biodiversity conservation and development objectives, with a particular emphasis on the Northern Limestone Highlands and Mekong River and its major tributaries	3.1 Support civil society efforts to analyze development policies, plans and programs, evaluate their impact on biodiversity and ecosystem services, and propose alternative development scenarios and appropriate mitigating measures
	3.2 Support initiatives that leverage support for biodiversity conservation from development projects and programs
	3.3 Conduct targeted outreach and awareness raising for decisionmakers, journalists, and lawyers
4. Provide strategic leadership and effective coordination of CEPF investment through a regional implementation team	4.1 Build a broad constituency of civil society groups working across institutional and political boundaries toward achieving the shared conservation goals described in the ecosystem profile

Strategic Direction 1: Safeguard globally threatened species in Indochina by mitigating major threats

Indochina is one of the most important regions in the world for the conservation of globally threatened species. The region supports 492 globally threatened species, including many found nowhere else. For certain taxonomic groups, such as primates,

Indo-Burma (of which Indochina is the largest part) supports more globally threatened species than any other hotspot. Indochina is also predicted to support large numbers of additional globally threatened species among taxonomic groups for which comprehensive global threat assessments have yet to be undertaken, such as invertebrates, fish, and plants.

Despite the importance of Indochina for globally threatened species, only a small percentage of total conservation investment in Indochina over the last decade was for species-focused action. In part, this reflects an assumption on the part of governments, donors, and NGOs that conservation of representative examples of natural ecosystems, principally through the establishment of protected areas, will be sufficient to maintain viable populations of all species. While this is true for many species, a significant number require additional action, such as control of overexploitation and trade, or research to establish their status and distribution.

Many civil society organizations active in the region have good capacity to take action for globally threatened species. Such work presents many opportunities for collaboration, both among civil society organizations and between them and government institutions. Where the potential for collaboration exists, there are also many opportunities for capacity building. Projects supported by CEPF should, wherever possible, seek to build the capacity of indigenous civil society and government institutions in species-focused research and action. This strategic direction focuses on the identified priority species. Projects financed under the following investment priorities are not geographically restricted to the priority sites and corridors.

1.1 Identify and secure core populations of 67 globally threatened species from overexploitation and illegal trade by implementing targeted, high-impact projects
Sixty-seven of the 265 globally threatened animal species in Indochina were selected as priority species. The most common conservation action required for these species is identifying and securing core populations from overexploitation. While there are several inter-related factors driving overexploitation of priority species, trade demand from both domestic and international markets is often key. Most governments in the region have enacted legislation to protect wildlife species from overexploitation and trade (the one exception is Cambodia, which has prepared, but not yet enacted, a Wildlife Protection Law). In addition, all countries in the region are contracting parties to CITES. Although there is room for improvement in wildlife protection and trade legislation in all countries, the major obstacles to effective control of overexploitation are lack of political will and lack of capacity (and motivation) among responsible government agencies.

In addition to identifying and securing core populations from overexploitation, a small number of priority species require additional species-focused actions, such as provision of adequate food supply in the case of white-rumped vulture and slender-billed vulture, where collapses of wild ungulate populations coupled with changes in livestock management practices have contributed to massive declines in the species; and active population management in the case of Eld's deer and lesser one-horned rhinoceros, where remnant populations in the region are small, fragmented, and may require active

population management, including translocations, in order to maintain their long-term genetic viability.

Civil society organizations are well positioned to implemented targeted, high-impact projects to conserve priority species, particularly as none of the government institutions responsible for biodiversity conservation in the region have significant species-focused programs. One area in which civil society could be very effective is strengthening the capacity of government institutions responsible for controlling overexploitation and trade of priority species, through training, information provision and coordination.

1.2 Implement public awareness campaigns that reinforce existing wildlife trade policies and contribute to the reduction of consumer demand for 67 globally threatened species and their products

Although some of the key markets for priority species threatened by overexploitation and trade lie outside of Indochina, and are, therefore, ineligible for CEPF funding under this investment strategy, a significant proportion are consumed within the region, both close to the point of source and in urban centers. In this regard, Thailand, Vietnam, and southern China are the major consumer markets in the region. While strengthened enforcement of wildlife protection and trade legislation may reduce pressure on wild populations of priority species, at least at specific sites, a significant reduction in consumer demand is needed to secure these populations in the long term.

Pilot civil society initiatives to promote changes in attitudes toward consumption of priority species and their products through public awareness campaigns have met with initial success in Hong Kong and Thailand. Given the rapid expansion of the urban middle class and the unabating spread of trade networks into previously remote areas, extension of such approaches to other parts of the region arguably represents the best opportunity to stem a potentially rapid increase in consumer demand for priority species and their products.

1.3 Investigate the status and distribution of globally threatened plant species, and apply the results to planning, management, awareness raising and/or outreach

Half of the 492 globally threatened species known to occur in Indochina are plants. The majority of these species are high value timber species threatened by overexploitation and habitat loss. Many species are inherently susceptible to these threats, either because they have naturally slow reproductive rates, or because they have very restricted distributions. Outside of Thailand, however, very little is known about the conservation status and distribution of most of these species. This is largely because, while significant resources have been invested in botanical surveys by governments throughout the region, most surveys have been for forestry purposes. For many species, therefore, although data exist, they have never been collated and evaluated from a conservation perspective; for other species, insufficient data are available to assess their status and conservation requirements without additional field surveys.

Actions that could be taken by civil society to investigate the status and distribution of globally threatened plant species include assessments of species' distributions based on

reviews of literature and herbarium collections, field surveys to assess population structure and status, and identification of key sites for their conservation.

In order to be eligible for CEPF funding, projects must ensure that the research results are applied to planning, management, awareness raising and/or outreach, for example by promoting the incorporation of key seed source areas into management plans for forest concessions. Great potential exists for using the research results to target other initiatives supported by CEPF, particularly ones under Strategic Directions 2 and 3. Projects under this investment priority must be clearly linked to policy, management, or conservation planning, and will have to demonstrate sustainability beyond the five-year investment period.

1.4 Assess the global threat status of selected freshwater taxa and integrate the results into planning processes for the conservation of wetland biodiversity and development plans in the priority corridors

Freshwater species provide the wetland products that are critical to many of the rural poor throughout Indochina. This dependency has been demonstrated by a recent study on rural livelihoods in Attapu province, Lao P.D.R., where a broad diversity of some 200 species of aquatic plants and animals were being used by villagers (Meusch *et al.* 2003). As well as supporting rural livelihoods, freshwater species are also among the most threatened in Indochina, as a result of unsustainable fishing practices, and habitat alteration and loss. However, the global threat status of freshwater taxa throughout the region is very poorly known. For example, only 22 species of fish from the Lower Mekong Basin have been assessed for their global threat status according to the IUCN Red List Categories and Criteria (W. Darwall *in litt.* 2004); the situation for other freshwater taxa in the region is even worse. This lack of global threat assessments for freshwater species creates a major bottleneck for conservation planning in the region, as resources cannot be targeted at the species requiring the most urgent conservation action, and the needs of freshwater species are not adequately addressed in conservation plans. There is, therefore, a critical need to assess the global threat status of freshwater taxa throughout the region, in order to leverage support for their conservation.

Global threat assessments of selected priority freshwater taxa should be undertaken early on during the five-year CEPF funding period, so that the results can help to target conservation action at priority sites, and be integrated into land-use and development plans within priority corridors. Because of the relatively modest resources that will be made available for this investment priority, only global threat assessments of selected freshwater taxa will be eligible for CEPF support: fish, crustaceans, mollusks, and odonates.

1.5 Conduct research on 12 globally threatened species species for which there is a need for greatly improved information on their status and distribution

Twelve priority species require greatly improved information on their status and distribution before conservation action can be taken in any meaningful way. Therefore, CEPF will support civil society organizations, alone or in partnership with government institutions or local communities, to conduct applied research on the status, ecology,

threats, and distribution of these species. As in the case of Investment Priority 1.3, projects must ensure that the research results are applied to planning, management, awareness raising and/or outreach, in order to be eligible for CEPF funding. If populations of any of the 12 species are located during the five-year investment period, they will then become eligible for CEPF funding for conservation action under Investment Priority 1.1.

Given the relatively small amounts of investment required to clarify the status and distribution of these 12 globally threatened species, and the significant opportunities for leveraging additional resources for their conservation, species-focused research can be very cost effective; particularly as it is, in many cases, a one-off investment.

1.6 Publish local-language reference materials on globally threatened species
One of the constraints on conservation action to safeguard globally threatened species in Indochina is lack of access to relevant information. Although essential reference materials, such as field guides, exist for many taxonomic groups, they are often inaccessible to local researchers, protected area staff and conservation planners, either because of their restricted circulation or because they are not published in local languages. Therefore, there is a need to publish local-language reference materials to support conservation action for globally threatened species in Indochina. Such publications would support other CEPF investments under strategic direction 1, particularly action to address wildlife trade, and surveys to fill major gaps in the knowledge base for conservation planning. They could also be expected to contribute to the broader development of civil society in Indochina, through generating interest in biodiversity among the general public.

In recent years, a number of local-language field guides have been published in Indochina, mostly facilitated by the World Bank. However, there is still a need for local-language guides for certain taxonomic groups, particularly, trees, amphibians and freshwater fish, which all include large numbers of globally threatened species. Moreover, there is a need to publish and disseminate other essential reference materials on globally threatened species in addition to field guides, such as checklists, status reviews, and action plans.

Strategic Direction 2: Develop innovative, locally led approaches to site-based conservation at 28 key biodiversity areas
There has been significant government and donor investment in site-based conservation in each country in the region. However, much of the investment to date has been concentrated at protected areas and focused on construction of infrastructure, provision of equipment, and alternative income-generating activities for local communities. An important niche for CEPF funding is to support civil society to strengthen the capacity of enforcement staff to control overexploitation at protected areas. Several civil society organizations are well placed to perform this role because of their skills and experience in this field, and there exist several examples of successful initiatives in the region. The most cost-effective approach may be to develop regional standards and training curricula, based on best practice models already developed. In addition, civil society is well placed

to engage local stakeholders in site-based conservation. This often represents a cost-efficient alternative to investment in protected area management, and a great opportunity to empower local communities to manage natural resources in a sustainable manner. Indeed, a number of pilot stakeholder-based conservation initiatives in the region have already met with initial success. Projects financed under the following investment priorities are restricted to the 28 priority sites within the two priority corridors, although 2.2 is likely to have national- and regional-level impacts.

2.1 Establish innovative stakeholder-based conservation management and caretaking initiatives

Within Indochina, 37 percent of key biodiversity areas are not included within formal protected areas, and this proportion is as high as 65 percent in Vietnam. Throughout the region, government institutions lack the necessary capacity, resources and political will to effectively manage national protected area systems, let alone sites outside of these systems. At many sites, however, other stakeholders, such as local communities, local authorities, and private sector companies, if informed and empowered, have high potential to support or assume responsibility for their conservation. Moreover, given the constraints imposed by existing protected area regulations in most countries in the region, stakeholder-based conservation initiatives can provide greater opportunities for local communities to participate in decisionmaking regarding the use of natural resources than formal protected areas approaches. Consequently, such initiatives can contribute to improved livelihoods for rural communities, especially those with high levels of dependence on natural resources.

Even within protected areas, there are many opportunities to engage local stakeholders in conservation, through, for example, joint patrolling or community co-management. While the vast majority of site-based conservation investment by governments and donors in the region to date has been focused on protected areas, little has been focused on actively involving local stakeholders in conservation activities. Therefore, there exists tremendous potential in the region for innovative, local-stakeholder-based approaches to conservation, both within and outside of protected areas. This is recognized in the Seventh Conference of the Parties to the CBD's Decision on Protected Areas, which "underlines the importance of conservation of biodiversity not only within but also outside protected areas" and suggests that parties "recognize and promote a broad set of protected area governance types... which may include areas conserved by indigenous and local communities."

In recent years, a number of pilot local stakeholder-based conservation initiatives have been implemented in the region. These include a community-based waterbird colony protection group at Prek Toal in Cambodia (Goes and Hong Chamnan 2002), community-based primate conservation groups in northern Vietnam (e.g. Swan and O'Reilly 2004), and village-protected Fish Conservation Zones in deepwater pools in the Mekong River in southern Lao P.D.R. (Baird 2001). These initiatives have demonstrated that local-stakeholder-based groups can be a very cost-effective means of mobilising additional human resources, which would otherwise not be brought to bear within the context of conventional approaches to conservation. In addition, unlike many major investments by donor agencies in site-based conservation, these initiatives have good

prospects for long-term sustainability, because they focus on building local capacity and structures, rather than bringing in capacity and structures from outside.

Despite their cost effectiveness and sustainability, limited donor funding has, to date, prevented these successful pilots from being scaled up significantly. Therefore, extending these approaches to priority sites in Indochina represents a major funding niche for CEPF. Actions that could be taken by civil society organizations with support from CEPF include establishing and building the capacity of local stakeholder-based conservation groups, initiating community patrol groups or joint patrolling with protected area staff, and supporting local stakeholder-based groups to develop local conservation regulations and initiate stewardship programs.

2.2 Develop regional standards and programs that address overexploitation of biodiversity and pilot at selected sites

Overexploitation of wildlife is one of the major threats to biodiversity in Indochina, and represents a particularly severe threat to many globally threatened species. To date, however, despite high levels of conservation investment in protected areas, there has not been sufficient commitment to controlling overexploitation of wildlife. Major beneficiaries of overexploitation are rarely the rural poor, who, as a group, are often negatively affected by these activities, which degrade the ecosystems upon which they depend. Therefore, control of overexploitation at priority sites represents a major funding gap in the region, and a significant niche for CEPF investment.

Given the large number of protected areas in the region where more effective enforcement is a high priority, rather than developing separate training initiatives at individual sites, it is likely to be far more cost effective to develop regional standards and programs for enforcement staff. These standards and programs should build on existing experience and best practice, and target all government staff in a position to enforce protected area management regulations (protected area staff, border guards, police, customs officials, etc). In order to field-test and refine the regional standards and programs, CEPF will support their piloting at priority sites. While circumstances may differ among priority sites, regional standards and programs focusing on a core set of competencies could be tailored to the needs of particular sites. Additional resources could later be leveraged to extend the standards and programs developed through CEPF investment to protected areas throughout the region.

Strategic Direction 3: Engage key actors in reconciling biodiversity conservation and development objectives, with a particular emphasis on the Northern Highlands Limestone Corridor and the Mekong River and its major tributaries

Conservation interventions in the region to date have tended to focus on tackling immediate threats to biodiversity, rather than on addressing underlying causes. While this approach has resulted in a number of successes at particular sites or for particular species, the overall trend has been one of continued degradation and loss of natural habitats, and declines in populations of globally threatened species. The underlying causes have included the relatively low priority given to biodiversity conservation by governments and most donor agencies; pursuit of economic policies inconsistent with biodiversity

conservation; and inadequate environmental safeguards in government and donor-funded development projects. Rather than viewing these underlying causes as unassailable obstacles, they should be seen as opportunities for civil society to "mainstream" biodiversity, thereby mitigating potential threats before they occur and leveraging sufficient resources and political support for conservation success. This is in-line with Millennium Development Goal No. 7 of the United Nations, which sets a target for the global community to "integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources".

To date, the major steps taken by governments and donors to mainstream biodiversity into other sectors have been to introduce safeguard policies (including environmental impact assessment), and increase stakeholder consultation during project development. Significant though these steps have been, they have proven insufficient to fully integrate biodiversity into other sectors, and the onus remains on civil society to take a more pro-active role. Civil society organizations are often particularly well placed for such a role, as they have good connections at the grassroots level, a good understanding of the impacts of policies and projects on biodiversity, and access to scientific data to support their arguments. Considering its potential to leverage resources and mitigate threats before they occur, engaging civil society in mainstreaming biodiversity can be extremely cost effective.

There is a need for civil society to engage key actors in reconciling biodiversity conservation and development objectives throughout Indochina. Given the finite amount of resources that will be available under this strategic direction, however, particular emphasis will be placed on supporting initiatives that focus on the priority corridors. Nevertheless, opportunities to support initiatives elsewhere in the region will also be considered, particularly where they present opportunities to engage civil society in major sectoral projects and programs of the World Bank.

3.1 Support civil society efforts to analyze development policies, plans and programs, evaluate their impact on biodiversity and ecosystem services, and propose alternative development scenarios and appropriate mitigating measures

Many of the major threats to biodiversity within the priority corridors do not originate from local communities but from land-use and development policies, plans and programs initiated at the provincial or national level. As a result, site-based conservation interventions, such as protected area management, are frequently undermined by incompatible development activities, such as human resettlement, infrastructure development and large-scale land-use change. A major factor contributing to this trend is the limited integration of biodiversity considerations into development planning processes, especially in sectors with potentially significant impacts on natural ecosystems (e.g. industry, energy, transport, forestry, agriculture, fisheries, etc.). In essence, managers and planners remain largely unaware of the impacts of development policies, plans and programs on biodiversity, and voices of concern from local communities and NGOs are not being heard.

There are several means by which civil society can promote the integration of biodiversity considerations into development policies, plans and programs, including conducting applied research, such as economic valuation and identification of critical sites for biodiversity; communicating conservation messages to decision makers; providing technical inputs to policy review processes, such as strategic environmental assessment; and monitoring and evaluating the impacts of development policies, plans and programs on biodiversity. CEPF will support activities designed to raise civil society capacity to effectively analyze the impacts of development policies, plans and programss on biodiversity, promote incorporation of biodiversity considerations and encourage incentive mechanisms that favour conservation.

3.2 Support initiatives that leverage support for biodiversity conservation from development projects and programs

Within the region, the majority of national government and donor funding in the natural resources sector is for projects and programs with a principal objective of poverty alleviation. These projects and programs include an ambitious government-donor initiative in Vietnam to restore the nation's forest cover to 1945 levels by 2010, and an equally ambitious program of the Chinese Government to convert slope farmland to forest. While it is not always the principal objective of these projects and programs, they represent great opportunities for civil society to leverage support for biodiversity conservation. For instance, resources available for reforestation, if targeted appropriately, could be used to increase connectivity among key biodiversity areas within Priority Corridors. In addition to the natural resources sector, there also exist opportunities for civil society to leverage support from projects and programs in other sectors or to develop partnerships with large-scale private sector initiatives.

There are various ways in which civil society organisations can leverage support for biodiversity conservation from on-going and planned projects and programs, including development and promotion of corridor-wide plans and strategies for biodiversity conservation.

3.3 Conduct targeted outreach and awareness raising for decisionmakers, journalists, and lawyers

Without the support of key decisionmakers in national and local government institutions and donor agencies, it is very difficult to successfully mainstream biodiversity into other sectors. With support from CEPF, civil society can conduct targeted outreach and awareness raising, not only for decisionmakers directly, but also for environmental journalists, who have a key role in bringing environmental issues to the attention of decisionmakers, and environmental lawyers, who have a key role in drafting legislation and enforcing the observance of Environmental Impact Assessment legislation.

In addition to mainstreaming biodiversity into other sectors, there are many other issues about which civil society may wish to conduct targeted outreach and awareness raising, and these will vary among countries in the region. Particular attention should, however, be given to outreach and awareness raising that help generate support for other initiatives supported by CEPF, such as control of overexploitation and trade of priority species.

Strategic Direction 4: Provide strategic leadership and effective coordination of CEPF investment through a regional implementation team

An independent evaluation of the global CEPF program found that CEPF regional implementation teams are particularly effective with the support of the CEPF grant directors in linking the key elements of comprehensive, vertically integrated portfolios such as large anchor projects, smaller grassroots activities, policy initiatives, governmental collaboration, and sustainable financing. As recommended by the evaluators, the responsibilities of these teams, formerly known as coordination units, have now been standardized to capture the most important aspects of their function.

In every hotspot, CEPF will support a regional implementation team to convert the plans in the ecosystem profile into a cohesive portfolio of grants that exceed in impact the sum of their parts. Each regional implementation team will consist of one or more civil society organizations active in conservation in the region. For example, a team could be a partnership of civil society groups or could be a lead organization with a formal plan to engage others in overseeing implementation, such as through an inclusive advisory committee.

The regional implementation team will be selected by the CEPF Donor Council based on an approved terms of reference, competitive process, and selection criteria available in PDF format at www.cepf.net/xp/cepf/static/pdfs/Final.CEPF.RIT.TOR_Selection.pdf. The team will operate in a transparent and open manner, consistent with the CEPF mission and all provisions of the CEPF Operational Manual. Organizations that are members of the Regional Implementation Team will not be eligible to apply for other CEPF grants within the same hotspot. Applications from formal affiliates of those organizations that have an independent operating board of directors will be accepted, and subject to additional external review.

4.1 Build a broad constituency of civil society groups working across institutional and political boundaries toward achieving the shared conservation goals described in the ecosystem profile

The regional implementation team will provide strategic leadership and local knowledge to build a broad constituency of civil society groups working across institutional and geographic boundaries toward achieving the conservation goals described in the ecosystem profile. The team's major functions and specific activities will be based on an approved terms of reference. Major functions of the team will be to:

- Act as an extension service to assist civil society groups in designing, implementing, and replicating successful conservation activities.
- Review all grant applications and manage external reviews with technical experts and advisory committees.
- Award grants up to $20,000 and decide jointly with the CEPF Secretariat on all other applications.
- Lead the monitoring and evaluation of individual projects using standard tools, site visits, and meetings with grantees, and assist the CEPF Secretariat in portfolio-level monitoring and evaluation.

- Widely communicate CEPF objectives, opportunities to apply for grants, lessons learned, and results.
- Involve the existing regional program of the RIT, CEPF donor and implementing agency representatives, government officials, and other sectors within the hotspot in implementation.
- Ensure effective coordination with the CEPF Secretariat on all aspects of implementation.

Specific activities and further details are available in the CEPF Regional Implementation Team Terms of Reference and Selection Process.

Sustainability

The CEPF investment strategy for Indochina has been designed to deliver long-term conservation and poverty alleviation benefits beyond the five-year investment period. Key features of the investment strategy contributing to its sustainability are:

- A basis of information will have been provided on the status and distribution of globally threatened plant and animal species through Investment Priorities 1.3, 1.4 and 1.5, which will ensure that future conservation investments in the region are more effectively focused, in terms of both geographic area and threats addressed.
- Knowledge of consumers about consumption of priority species and their products will have been expanded through Investment Priority 1.2, while key populations of these species will have been identified and secured through Investment Priority 1.1, reducing pressure on wild populations of these species beyond the investment period.
- Grassroots support for biodiversity conservation will have been generated at key biodiversity areas throughout the region through the development of local-stakeholder-based initiatives under Investment Priority 2.1.
- The capacity of enforcement staff to enforce management regulations will have been strengthened through Investment Priority 2.2, ensuring that future investments in protected areas by national governments are more effective in controlling overexploitation and other key threats to biodiversity.
- Biodiversity considerations will have been mainstreamed into other sectors through Investment Priorities 3.1 and 3.2, significantly reducing future threats to biodiversity, particularly within priority corridors.
- The capacity of civil society organizations in species-focused conservation, local-stakeholder-based conservation, policy analysis, outreach and awareness raising will have been significantly strengthened through Strategic Directions 1, 2, 3, and 4, ensuring that future investments in conservation through civil society organizations are more effective.
- The regional implementation team established under Strategic Direction 4 will have created important linkages within its own program and with CEPF donor partners and implementing agencies across the hotspot, as well as with governments and other sectors that will help sustain progress achieved during the investment period.

CONCLUSION

In terms of species diversity and endemism, Indochina is one of the most biologically important regions on the planet. A spate of discoveries of new species during the 1990s focused the attention of the global conservation community on Indochina. Changing political climates in several countries meant that increasing amounts of international donor assistance, including conservation investment, flowed into most countries in the region from the early 1990s onward. During this period, national governments also made significant investments in conservation, particularly through the expansion of national protected area networks.

Despite the considerable sums invested in conservation in the region, there remain several major and immediate threats to biodiversity, most significantly overexploitation and habitat degradation and loss. The underlying causes of these threats include economic growth and increasing consumption, poverty, weak governance, economic incentives, undervaluation, inappropriate land tenure, and, potentially, global climate change. Civil society is well placed to address both immediate threats to species, sites, and ecosystems, and their underlying causes. However, current investment does not always target the highest conservation priorities or promote the most effective approaches, and the potential to engage civil society in biodiversity conservation has yet to be fully realized. In this context, the opportunities for CEPF to support biodiversity conservation in the region are almost limitless.

In order to focus future CEPF investment in the region most effectively, a yearlong preparation process was undertaken, involving five expert roundtables and consultations with more than 170 stakeholders from civil society organizations, government institutions and donor agencies. The output of this process was this ecosystem profile, which includes a five-year investment strategy for CEPF in the region. This strategy is divided into investment priorities, grouped into four strategic directions (broadly, a globally threatened species component, a key biodiversity areas component, a conservation corridors component, and a regional implementation team component).

CEPF investment will be concentrated within two priority corridors (the Mekong River and Major Tributaries, and the Northern Highlands Limestone), and the 28 priority sites they contain. Moreover, CEPF investment will focus on 67 priority species, which require species-focused action in addition to site-based and landscape-scale conservation. Although ambitious, the CEPF investment strategy is realistic, and represents an important opportunity to realize the potential of civil society in the region, and to make a lasting contribution to the conservation of the region's unique and irreplaceable biodiversity values.

INDO-BURMA HOTSPOT (INDOCHINA REGION) LOGICAL FRAMEWORK

Objective	Targets	Means of Verification	Important Assumptions
Engage civil society in the conservation of globally threatened biodiversity through targeted investments with maximum impact on the highest conservation priorities	NGOs and civil society actors actively participate in conservation programs guided by the ecosystem profile. Alliances and networks among civil society groups formed to avoid duplication of effort and maximize impact in support of the CEPF ecosystem profile. 28 key biodiversity areas have new or strengthened protection and management Development plans or policies influenced to accommodate biodiversity. Improved management for biodiversity conservation or sustainable use within production landscapes in 2 conservation corridors covering 41,547 km^2 or approximately 3 percent of the region.	Grantee and RIT performance reports Annual portfolio overview reports; portfolio midterm and final assessment	The CEPF grants portfolio will effectively guide and coordinate conservation action in the Indochina Region of the Indo-Burma Hotspot.
Intermediate Outcomes	**Intermediate Indicators**	**Means of Verification**	**Important Assumptions**
Outcome 1: Globally threatened species	Core populations of priority species identified and secured from	Grantee and RIT performance reports	National and international laws provide an appropriate basis for

in Indochina safeguarded by mitigating major threats $3,950,000	overexploitation and illegal trade by implementing targeted, high-impact projects Public awareness campaigns that reinforce existing wildlife trade policies implemented and contributing to the reduction of consumer demand for priority species and their products The status and distribution of globally threatened plant species investigated and results applied to planning, management, awareness raising and/or outreach The global threat status of selected freshwater taxa assessed and the results integrated into planning for the conservation of wetland biodiversity and development plans in the priority corridors Research on priority species conducted where there is a need for greatly improved information on their status and distribution Local language reference materials on globally threatened species published	CEPF Secretariat site visits and monitoring.	species-focused conservation action Sufficient political will to control overexploitation of wildlife species exists or can be generated Local media are willing to support public awareness campaigns General public is receptive to conservation messages about consumption of wildlife Botanic gardens and herbaria are willing to make information on globally threatened plant species available to researchers Government conservation agencies are receptive to new information on globally threatened species Sufficient civil society capacity to implement species-focused conservation exists or can be built
Outcome 2: Innovative, locally led approaches to site-based conservation developed at 28	Innovative local stakeholder-based conservation management and caretaking initiatives established	Protected Areas Tracking Tool (SP1 METT)	Local stakeholders are willing to play an active role in site-based conservation

key biodiversity areas $2,150,000	Regional standards and programs that address overexploitation of biodiversity are developed and piloted at selected sites Percent of projects that enable effective stewardship of biodiversity and ecosystem services by Indigenous and local communities in focal areas Percent of targeted communities involved in sustainable use projects that show socioeconomic benefits. Percent of targeted protected areas with strengthened protection and management Percent of projects outside protected areas that integrate biodiversity conservation in management practices	Productive Landscape Tracking Tool (SP2 METT) Grantee and RIT performance reports Formal legal declarations or community agreements designating new protected areas CEPF Secretariat site visits and monitoring.	Government policies permit the establishment of local, stakeholder-based conservation groups National governments maintain or increase human and financial resources for formal protected areas Protected area managers and enforcement staff are receptive to training initiatives Appropriate site-based monitoring protocols can be identified or developed Sufficient civil society capacity to implement site-based conservation exists or can be built
Outcome 3: Key actors in reconciling biodiversity conservation and development objectives engaged, with a particular emphasis on the Northern Limestone Highlands and Mekong River and its major tributaries	Civil society efforts to analyze development policies, plans, and programs, evaluate their impact on biodiversity and ecosystem services and propose alternative development scenarios and appropriate mitigating measures implemented Initiatives that leverage support for	Grantee and RIT performance reports CEPF Secretariat site visits and monitoring.	Governments and donors are committed to environmentally sustainable development Governments and donors are willing to engage with civil society Ongoing and planned projects and programs have potential to

$2,500,000	biodiversity conservation from development projects and programs Targeted outreach and awareness raising for decision makers, journalists and lawyers conducted		support biodiversity conservation in the corridors Increased environmental awareness will translate into increased support for conservation initiatives Sufficient civil society capacity to undertake biodiversity mainstreaming exists or can be built
Outcome 4: A regional implementation team provides strategic leadership and effectively coordinates CEPF investment in the Indochina Region of the Indo-Burma Hotspot. $900,000	Percent of civil society groups receiving grants that demonstrate more effective capacity to plan and manage conservation projects. RIT performance in fulfilling the approved terms of reference At least 2 learning exchanges and/or participatory assessments hosted and documented	Grantee and RIT performance reports CEPF Secretariat site visits and monitoring.	Qualified organizations will apply to serve as the regional implementation team in line with the approved terms of reference and the ecosystem profile The CEPF call for proposals will elicit appropriate proposals that advance the objectives of the ecosystem profile Civil society organizations will collaborate with each other, government agencies, and private sector actors in a coordinated regional conservation program in line with the ecosystem profile
Strategic Funding Summary	**Amount**		
Total Budget	$9,500,000		

ABBREVIATIONS USED IN THE TEXT

ADB	Asian Development Bank
AFCD	Agriculture, Fisheries and Conservation Department (Hong Kong, China)
ARCBC	ASEAN Regional Centre for Biodiversity Conservation
ASEAN	Association of South-East Asian Nations
BCST	Bird Conservation Society of Thailand
BP	British Petroleum
BRT	Biodiversity Research and Training (Thailand)
CABS	Center for Applied Biodiversity Science
CAS	Chinese Academy of Sciences
CAT	Cat Action Treasury
CBD	Convention on Biological Diversity
CCICED	China Council for International Cooperation on Environment and Development
CEPF	Critical Ecosystem Partnership Fund
CI	Conservation International
CIDA	Canadian International Development Agency
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DANCED	Danish Cooperation on Environment and Development
Danida	Danish International Development Assistance
DNCP	Department of Nature Conservation and Protection (Cambodia)
DoF	Department of Forestry (Lao P.D.R.)
EU	European Union
FFI	Fauna & Flora International
FPD	Forest Protection Department (Vietnam)
FSDP	Forest Sector Development Project
FUNDESO	Sustainable Development Foundation
GCF	Global Conservation Fund
GDP	gross domestic product
GEF	Global Environment Facility
IBA	Important Bird Area
ICDP	Integrated Conservation and Development Project
ICF	International Crane Foundation
ITTO	International Tropical Timber Organization
IUCN	World Conservation Union
KFBG	Kadoorie Farm & Botanic Garden
MAB	Man and the Biosphere
MAFF	Ministry of Agriculture, Forestry and Fisheries (Cambodia)
MARD	Ministry of Agriculture and Rural Development (Vietnam)
MoE	Ministry of Environment (Cambodia)
MoFI	Ministry of Fisheries (Vietnam)
MONRE	Ministry of Natural Resources and Environment (Vietnam)
MRC	Mekong River Commission
NAREBI	National Resources and Biodiversity Institute (Thailand)

NFWF	National Fish and Wildlife Foundation
NGO	nongovernmental organization
NTFP	non-timber forest product
ODA	Overseas Development Assistance
SEPA	State Environmental Protection Administration (China)
SEPC	State Environmental Protection Committee (China)
SIDA	Swedish International Development Agency
STEA	Science, Technology and Environment Agency (Lao P.D.R.)
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNF	United Nations Foundation
UNTAC	United Nations Transitional Authority in Cambodia
USFWS	U.S. Fish and Wildlife Service
VCF	Vietnam Conservation Fund
WCS	Wildlife Conservation Society
WWF	World Wide Fund for Nature; World Wildlife Fund

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APPENDICES

Appendix 1. Globally Threatened Species in Indochina

No.	Scientific Name	Common Name	Global Threat Status			Distribution by Country					Selection Criteria for Priority Species				
			Critically Endangered	Endangered	Vulnerable	Cambodia	Lao P.D.R.	S. China	Thailand	Vietnam	Indochinese Population is Globally Significant	Species-focused Action Required	Greatly Improved Information Required	Urgency for Conservation Action	Opportunity for Additional Investment
	MAMMALS		**10**	**18**	**32**	**26**	**32**	**32**	**34**	**42**					
1	*Ailurus fulgens*	Red Panda		EN				+			Yes	No	No	N/A	N/A
2	*Bos gaurus*	Gaur			VU	+	+	+	+	+	Yes	No	No	N/A	N/A
3	*Bos javanicus*	Banteng		EN		+	+		+	+	Yes	No	No	N/A	N/A
4	*Bos sauveli*	Kouprey	CR			+	+			+	Yes	N/A	Yes	High	High
5	*Bubalus bubalis*	Wild Water Buffalo		EN		+			+	+	Yes	Yes	No	High	High
6	*Bunipithecus hoolock*	Hoolock Gibbon		EN				+			Yes	No	No	N/A	N/A
7	*Callosciurus pygerythrus*	Irrawaddy Squirrel			VU			+			Yes	No	No	N/A	N/A
8	*Capricornis sumatraensis*	Southern Serow			VU	+	+	+	+	+	Yes	No	No	N/A	N/A
9	*Catopuma temminckii*	Asian Golden Cat			VU	+	+	+	+	+	Yes	Yes	No	High	High
10	*Cervus eldii*	Eld's Deer			VU	+	+	+		+	Yes	Yes	No	High	High
11	*Chrotogale owstoni*	Owston's Civet			VU		+	+		+	Yes	No	No	N/A	N/A
12	*Craseonycteris thonglongyai*	Kitti's Hog-nosed Bat		EN					+		Yes	No	No	N/A	N/A
13	*Cuon alpinus*	Dhole			VU	+	+	+	+	+	Yes	No	No	N/A	N/A
14	*Cynogale bennettii*[5]	Otter Civet		EN					+	+	Yes	N/A	Yes	High	High
15	*Dicerorhinus sumatrensis*	Hairy Rhinoceros	CR				+		+		Yes	Yes	No	High	High
16	*Elephas maximus*	Asian Elephant		EN		+	+	+	+	+	Yes	Yes	No	High	High
17	*Eptesicus demissus*	Surat Serotine			VU				+		Yes	No	No	N/A	N/A

[5] includes both *C. b. bennettii* and *C. b. lowei*.

No.	Scientific Name	Common Name	Global Threat Status			Distribution by Country					Selection Criteria for Priority Species				
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18	*Euroscaptor parvidens*	Small-toothed Mole	CR							+	Yes	N/A	Yes	High	High
19	*Hipposideros turpis*	Lesser Great Leaf-nosed Bat		EN					+	+	Yes	No	No	N/A	N/A
20	*Hylobates pileatus*	Pileated Gibbon			VU	+	+		+		Yes	Yes	No	Medium	Medium
21	*Hylomys hainanensis*	Hainan Gymnure		EN				+			Yes	N/A	Yes	Medium	Medium
22	*Hylopetes alboniger*	Particolored Flying Squirrel		EN		+	+	+	+	+	Yes	No	No	N/A	N/A
23	*Hystrix brachyura*	East Asian Porcupine			VU	+	+	+	+	+	Yes	No	No	N/A	N/A
24	*Leopoldamys neilli*	Long-tailed Giant Rat		EN					+		Yes	No	No	N/A	N/A
25	*Lepus hainanus*	Hainan Hare			VU			+			Yes	N/A	Yes	Medium	Medium
26	*Lutra lutra*	Eurasian Otter			VU	+	+	+	+	+	No	N/A	N/A	N/A	N/A
27	*Lutrogale perspicillata*	Smooth-coated Otter			VU	+	+	+	+	+	Yes	Yes	No	High	High
28	*Macaca arctoides*	Bear Macaque			VU	+	+	+	+	+	Yes	No	No	N/A	N/A
29	*Macaca assamensis*	Assamese Macaque			VU		+	+	+	+	Yes	No	No	N/A	N/A
30	*Macaca leonina*	Northern Pig-tailed Macaque			VU	+	+	+	+	+	Yes	No	No	N/A	N/A
31	*Macaca nemestrina*	Sundaland Pig-tailed Macaque			VU				+		No	N/A	N/A	N/A	N/A
32	*Muntiacus crinifrons*	Black Muntjac			VU			+			No	N/A	N/A	N/A	N/A
33	*Mustela strigidorsa*	Stripe-backed Weasel			VU		+	+	+	+	Yes	No	No	N/A	N/A
34	*Myotis longipes*	Kashmir Cave Bat			VU					+	Yes	No	No	N/A	N/A
35	*Naemorhedus caudatus*	Long-tailed Goral			VU			+	+		No	N/A	N/A	N/A	N/A
36	*Neofelis nebulosa*	Clouded Leopard			VU	+	+	+	+	+	Yes	Yes	No	High	High
37	*Nomascus concolor*[6]	Black Crested Gibbon		EN			+	+		+	Yes	Yes	No	High	High
38	*Nomascus gabriellae*	Yellow-cheeked Crested Gibbon			VU	+	+			+	Yes	Yes	No	Medium	Medium

[6] includes *N. c. concolor*, *N. c. nasutus* and *N. c. hainanus*.

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39	*Nycticebus pygmaeus*	Pygmy Loris			VU	+	+	+		+	Yes	No	No	N/A	N/A
40	*Otomops wroughtoni*	Wroughton's Free-tailed Bat	CR			+					Yes	N/A	Yes	High	High
41	*Panthera tigris*	Tiger		EN		+	+	+	+	+	Yes	Yes	No	High	High
42	*Paracoelops megalotis*	Vietnam Leaf-nosed Bat	CR							+	Yes	N/A	Yes	High	High
43	*Pardofelis marmorata*	Marbled Cat			VU	+	+		+	+	Yes	Yes	No	High	High
44	*Prionailurus planiceps*	Flat-headed Cat			VU				+		No	N/A	N/A	N/A	N/A
45	*Prionailurus viverrinus*	Fishing Cat			VU	+	+		+	+	Yes	Yes	No	High	High
46	*Pseudoryx nghetinhensis*	Saola		EN			+			+	Yes	Yes	No	High	High
47	*Pygathrix nemaeus*[7]	Red-shanked Douc		EN			+			+	Yes	Yes	No	High	High
48	*Pygathrix nigripes*	Black-shanked Douc		EN		+				+	Yes	Yes	No	High	High
49	*Rattus sikkimensis*	Sikkim Rat			VU	+	+	+	+	+	Yes	No	No	N/A	N/A
50	*Rhinoceros sondaicus*	Lesser One-horned Rhinoceros	CR				+			+	Yes	Yes	No	High	High
51	*Rhinolophus paradoxolophus*	Bourret's Horseshoe Bat			VU				+	+	Yes	No	No	N/A	N/A
52	*Rhinopithecus avunculus*	Tonkin Snub-nosed Monkey	CR							+	Yes	Yes	No	High	High
53	*Tapirus indicus*	Asian Tapir		EN					+		Yes	No	No	N/A	N/A
54	*Trachypithecus delacouri*	Delacour's Leaf Monkey	CR							+	Yes	Yes	No	High	High
55	*Trachypithecus francoisi*[8]	Francois's Leaf Monkey			VU		+	+		+	Yes	Yes	No	High	High
56	*Trachypithecus poliocephalus*[9]	White-headed Leaf Monkey	CR					+		+	Yes	Yes	No	High	High

[7] includes both *P. n. nemaeus* and *P. n. cinerea.*
[8] includes *T. f. francoisi*, *T. f. hatinhensis* and *T. f. ebenus* but not *T. laotum*.
[9] includes both *T. p. poliocephalus* and *T. p. leucocephalus*.

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57	*Trogopterus xanthipes*	Complex-toothed Flying Squirrel		EN				+			Yes	N/A	Yes	Medium	High
58	*Typhlomys chapensis*	Chapa Pygmy Dormouse	CR							+	Yes	N/A	Yes	High	High
59	*Ursus thibetanus*	Asian Black Bear			VU	+	+	+	+	+	Yes	Yes	No	High	High
60	*Vernaya fulva*	Vernay's Climbing Mouse			VU			+	+		Yes	No	No	N/A	N/A
	BIRDS		**8**	**16**	**49**	**24**	**22**	**30**	**45**	**40**					
61	*Aceros nipalensis*	Rufous-necked Hornbill			VU		+	+	+	+	Yes	Yes	No	Medium	Medium
62	*Aceros subruficollis*	Plain-pouched Hornbill			VU				+		Yes	No	No	N/A	N/A
63	*Acrocephalus sorghophilus*	Streaked Reed-warbler			VU			+			No	N/A	N/A	N/A	N/A
64	*Acrocephalus tangorum*	Manchurian Reed-warbler			VU	+	+	+	+	+	Yes	No	No	N/A	N/A
65	*Actinodura sodangorum*	Black-crowned Barwing			VU		+			+	Yes	No	No	N/A	N/A
66	*Alcedo euryzona*	Blue-banded Kingfisher			VU				+		Yes	No	No	N/A	N/A
67	*Anas formosa*	Baikal Teal			VU			+	+		No	N/A	N/A	N/A	N/A
68	*Apus acuticauda*	Dark-rumped Swift			VU				+		No	N/A	N/A	N/A	N/A
69	*Aquila clanga*	Greater Spotted Eagle			VU	+	+	+	+	+	No	N/A	N/A	N/A	N/A
70	*Aquila heliaca*	Imperial Eagle			VU	+	+	+	+	+	No	N/A	N/A	N/A	N/A
71	*Arborophila ardens*	Hainan Partridge			VU			+			Yes	No	No	N/A	N/A
72	*Arborophila cambodiana*	Chestnut-headed Partridge		EN		+			+		Yes	No	No	N/A	N/A
73	*Arborophila davidi*	Orange-necked Partridge		EN		+				+	Yes	No	No	N/A	N/A
74	*Aythya baeri*	Baer's Pochard			VU			+	+	+	Yes	No	No	N/A	N/A
75	*Cairina scutulata*	White-winged Duck		EN		+	+		+	+	Yes	Yes	No	High	High

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76	*Centropus rectunguis*	Short-toed Coucal			VU				+		No	N/A	N/A	N/A	N/A
77	*Ciconia boyciana*	Oriental Stork		EN				+			No	N/A	N/A	N/A	N/A
78	*Ciconia stormi*	Storm's Stork		EN					+		No	N/A	N/A	N/A	N/A
79	*Columba punicea*	Pale-capped Pigeon			VU	+	+	+	+	+	Yes	No	No	N/A	N/A
80	*Crex crex*	Corncrake			VU					+	No	N/A	N/A	N/A	N/A
81	*Crocias langbianis*	Grey-crowned Crocias		EN						+	Yes	No	No	N/A	N/A
82	*Egretta eulophotes*	Chinese Egret			VU			+	+	+	No	N/A	N/A	N/A	N/A
83	*Emberiza sulphurata*	Yellow Bunting			VU			+			No	N/A	N/A	N/A	N/A
84	*Eurychelidon sirintarae*	White-eyed River-martin	CR						+		Yes	N/A	Yes	High	High
85	*Eurynorhynchus pygmeus*	Spoon-billed Sandpiper			VU			+	+	+	No	N/A	N/A	N/A	N/A
86	*Falco naumanni*	Lesser Kestrel			VU		+				No	N/A	N/A	N/A	N/A
87	*Fregata andrewsi*	Christmas Island Frigatebird	CR			+		+	+		Yes	No	No	N/A	N/A
88	*Gallinago nemoricola*	Wood Snipe			VU		+		+	+	No	N/A	N/A	N/A	N/A
89	*Garrulax konkakinhensis*	Chestnut-eared Laughingthrush			VU					+	Yes	No	No	N/A	N/A
90	*Garrulax ngoclinhensis*	Golden-winged Laughingthrush			VU					+	Yes	No	No	N/A	N/A
91	*Garrulax yersini*	Collared Laughingthrush		EN						+	Yes	No	No	N/A	N/A
92	*Gorsachius goisagi*	Japanese Night-heron		EN				+			No	N/A	N/A	N/A	N/A
93	*Gorsachius magnificus*	White-eared Night-heron		EN				+		+	Yes	N/A	Yes	High	High
94	*Grus antigone*	Sarus Crane			VU	+	+	+		+	Yes	Yes	No	High	High
95	*Gyps bengalensis*	White-rumped Vulture	CR			+	+		+	+	Yes	Yes	No	High	High
96	*Gyps tenuirostris*	Slender-billed Vulture	CR			+	+		+	+	Yes	Yes	No	High	High
97	*Haliaeetus leucoryphus*	Pallas's Fish-eagle			VU	+					No	N/A	N/A	N/A	N/A

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98	*Heliopais personata*	Masked Finfoot			VU	+	+		+	+	Yes	Yes	No	High	High
99	*Houbaropsis bengalensis*	Bengal Florican		EN		+				+	Yes	Yes	No	High	Medium
100	*Larus relictus*	Relict Gull			VU			+		+	No	N/A	N/A	N/A	N/A
101	*Larus saundersi*	Saunders's Gull			VU			+		+	No	N/A	N/A	N/A	N/A
102	*Leptoptilos dubius*	Greater Adjutant		EN		+	+		+	+	Yes	Yes	No	High	High
103	*Leptoptilos javanicus*	Lesser Adjutant			VU	+	+		+	+	Yes	Yes	No	High	High
104	*Locustella pleskei*	Styan's Grasshopper Warbler			VU			+			Yes	No	No	N/A	N/A
105	*Lophura edwardsi*	Edwards's Pheasant		EN						+	Yes	Yes	No	Medium	Low
106	*Lophura hatinhensis*	Vietnamese Pheasant		EN						+	Yes	Yes	No	Medium	Low
107	*Luscinia obscura*	Black-throated Blue Robin			VU				+		Yes	No	No	N/A	N/A
108	*Mergus squamatus*	Scaly-sided Merganser		EN				+	+	+	No	N/A	N/A	N/A	N/A
109	*Mycteria cinerea*	Milky Stork			VU	+			+		No	N/A	N/A	N/A	N/A
110	*Oriolus mellianus*	Silver Oriole			VU	+			+		Yes	No	No	N/A	N/A
111	*Otus sagittatus*	White-fronted Scops-owl			VU				+		Yes	No	No	N/A	N/A
112	*Pavo muticus*	Green Peafowl			VU	+	+	+	+	+	Yes	Yes	No	High	High
113	*Pelecanus philippensis*	Spot-billed Pelican			VU	+	+		+	+	Yes	Yes	No	High	Medium
114	*Phylloscopus hainanus*	Hainan Leaf-warbler			VU			+			Yes	No	No	N/A	N/A
115	*Pitta gurneyi*	Gurney's Pitta	CR						+		Yes	No	No	N/A	N/A
116	*Pitta nympha*	Fairy Pitta			VU			+		+	No	N/A	N/A	N/A	N/A
117	*Platalea minor*	Black-faced Spoonbill		EN				+	+	+	Yes	No	No	N/A	N/A
118	*Polyplectron germaini*	Germain's Peacock-pheasant			VU	+				+	Yes	No	No	N/A	N/A
119	*Polplectron inopinatum*	Mountain Peacock-pheasant			VU				+		No	N/A	N/A	N/A	N/A

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120	*Polyplectron malacense*	Malaysian Peacock-pheasant			VU				+		No	N/A	N/A	N/A	N/A
121	*Pseudibis davisoni*	White-shouldered Ibis	CR			+	+			+	Yes	Yes	No	High	High
122	*Rheinardia ocellata*	Crested Argus			VU		+			+	Yes	No	No	N/A	N/A
123	*Rhinomyias brunneata*	Brown-chested Jungle-flycatcher			VU			+	+		Yes	No	No	N/A	N/A
124	*Rynchops albicollis*	Indian Skimmer			VU				+		No	N/A	N/A	N/A	N/A
125	*Sitta formosa*	Beautiful Nuthatch			VU		+	+	+	+	Yes	No	No	N/A	N/A
126	*Sitta magna*	Giant Nuthatch			VU			+	+		Yes	No	No	N/A	N/A
127	*Spizaetus nanus*	Wallace's Hawk-eagle			VU				+		Yes	No	No	N/A	N/A
128	*Sterna bernsteini*	Chinese Crested Tern	CR						+		No	N/A	N/A	N/A	N/A
129	*Syrmaticus humiae*	Hume's Pheasant			VU			+	+		Yes	No	No	N/A	N/A
130	*Thaumatibis gigantea*	Giant Ibis	CR			+	+			+	Yes	Yes	No	High	High
131	*Treron capellei*	Large Green-pigeon			VU				+		Yes	No	No	N/A	N/A
132	*Tringa guttifer*	Spotted Greenshank		EN		+		+	+	+	Yes	No	No	N/A	N/A
133	*Turdus feae*	Grey-sided Thrush			VU		+		+		Yes	No	No	N/A	N/A
	REPTILES		**9**	**16**	**8**	**11**	**13**	**16**	**18**	**22**					
134	*Amyda cartilaginea*	Asiatic Softshell Turtle			VU	+	+		+	+	Yes	Yes	No	High	High
135	*Batagur baska*	Mangrove Terrapin	CR			+			+		Yes	Yes	No	High	Medium
136	*Callagur borneoensis*	Painted Terrapin	CR						+		Yes	Yes	No	High	High
137	*Chinemys nigricans*	Red-necked Pond Turtle		EN				+			Yes	Yes	Yes	High	High
138	*Chinemys reevesii*	Chinese Three-keeled Pond Turtle		EN				+			Yes	Yes	No	High	High
139	*Chitra chitra*	Striped Narrow-headed Softshell Turtle	CR						+		Yes	Yes	No	High	High

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140	*Crocodylus siamensis*	Siamese Crocodile	CR			+	+		+	+	Yes	Yes	No	High	High
141	*Cuora amboinensis*	Asian Box Turtle			VU	+			+	+	Yes	Yes	No	Low	Low
142	*Cuora galbinifrons*	Indochinese Box Turtle	CR				+	+		+	Yes	Yes	No	High	High
143	*Cuora trifasciata*	Chinese Three-striped Box Turtle	CR				+	+		+	Yes	Yes	No	High	High
144	*Cuora zhoui*	Zhou's Box Turtle	CR					+			Yes	Yes	Yes	High	High
145	*Geoemyda spengleri*	Black-breasted Leaf Turtle		EN				+		+	Yes	Yes	No	High	High
146	*Heosemys grandis*	Giant Asian Pond Turtle			VU	+	+		+	+	Yes	Yes	No	Low	Low
147	*Heosemys spinosa*	Spiny Turtle		EN					+		Yes	Yes	No	Medium	Medium
148	*Hieremys annandalii*	Yellow-headed Temple Turtle		EN		+	+		+	+	Yes	Yes	No	High	High
149	*Indotestudo elongata*	Elongated Tortoise		EN		+	+		+	+	Yes	Yes	No	Medium	Medium
150	*Malayemys subtrijuga*	Malayan Snail-eating Turtle			VU	+	+		+	+	Yes	Yes	No	Low	Low
151	*Manouria emys*	Asian Giant Tortoise		EN					+		Yes	Yes	No	High	High
152	*Manouria impressa*	Impressed Tortoise			VU	+	+	+	+	+	Yes	Yes	No	High	High
153	*Mauremys annamensis*	Vietnamese Pond Turtle	CR							+	Yes	Yes	Yes	High	High
154	*Mauremys mutica*	Asian Yellow Pond Turtle		EN				+		+	Yes	Yes	No	High	High
155	*Notochelys platynota*	Malayan Flat-shelled Turtle			VU				+		No	N/A	N/A	N/A	N/A
156	*Ocadia sinensis*	Chinese Stripe-necked Turtle		EN				+		+	Yes	Yes	No	High	High
157	*Palea steindachneri*	Wattle-necked Softshell Turtle		EN				+		+	Yes	Yes	No	High	High
158	*Pelochelys cantorii*	Asian Giant Softshell Turtle		EN		+	+	+	+	+	Yes	Yes	No	High	High
159	*Pelodiscus sinensis*	Chinese Softshell Turtle			VU			+		+	No	N/A	N/A	N/A	N/A

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160	*Platysternon megacephalum*	Big-headed Turtle		EN			+	+	+	+	Yes	Yes	No	Medium	Medium
161	*Pyxidea mouhotii*	Keeled Box Turtle		EN			+	+		+	Yes	Yes	No	High	Medium
162	*Rafetus swinhoei*	East Asian Giant Softshell Turtle	CR							+	Yes	Yes	Yes	High	High
163	*Sacalia bealei*	Beale's Eyed Turtle		EN				+			Yes	Yes	No	High	High
164	*Sacalia quadriocellata*	Four-eyed Turtle		EN			+	+		+	Yes	Yes	No	High	High
165	*Siebenrockiella crassicollis*	Black Marsh Turtle			VU	+			+	+	Yes	Yes	No	Low	Low
166	*Tomistoma schlegelii*	False Gharial		EN					+		No	N/A	N/A	N/A	N/A
	AMPHIBIANS		**1**	**8**	**37**	**2**	**4**	**26**	**6**	**23**					
167	*Amolops hainanensis*	Hainan Torrent Frog		EN				+			Yes	No	No	N/A	N/A
168	*Amolops viridimaculatus*	Green-spotted Torrent Frog			VU					+	Yes	No	No	N/A	N/A
169	*Ansonia siamensis*	Siamese Stream Toad			VU				+		Yes	No	No	N/A	N/A
170	*Bombina microdeladigitora*	Small-webbed Bell Toad			VU			+		+	Yes	No	No	N/A	N/A
171	*Brachytarsophrys intermedia*	Annam Spadefoot Toad			VU					+	Yes	No	No	N/A	N/A
172	*Buergeria oxycephala*	Hainan Stream Frog		EN				+			Yes	No	No	N/A	N/A
173	*Caudacaecilia larutensis*	Larut Hills Caecilian			VU				+		Yes	No	No	N/A	N/A
174	*Chaparana unculuanus*	Yunnan Asian Frog		EN				+			Yes	No	No	N/A	N/A
175	*Ichthyophis supachaii*	Supachai's Caecilian			VU				+		Yes	No	No	N/A	N/A
176	*Ingerana tasanae*	Tasan Frog			VU				+		Yes	No	No	N/A	N/A
177	*Leptobrachium banae*	Red-legged Leaflitter Toad			VU		+			+	Yes	No	No	N/A	N/A
178	*Leptobrachium hainanensis*	Hainan Pseudomoustache Toad			VU			+			Yes	No	No	N/A	N/A

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179	*Leptobrachium xanthospilum*	Yellow-spotted Leaflitter Toad			VU					+	Yes	No	No	N/A	N/A
180	*Leptolalax tuberosus*	Asian toad species			VU					+	Yes	No	No	N/A	N/A
181	*Leptolalax ventripunctatus*	Speckle-bellied Metacarpal-tubercled Toad	CR					+			Yes	No	No	N/A	N/A
182	*Limnonectes toumanoffi*	Toumanoff's Wart Frog			VU	+				+	Yes	No	No	N/A	N/A
183	*Liurana liui*	Liu's Papillae-tonged Frog			VU			+			Yes	No	No	N/A	N/A
184	*Paa boulengeri*	Spiny-bellied Frog		EN				+		+	Yes	No	No	N/A	N/A
185	*Paa exilispinosa*	Little Spiny Frog			VU			+			No	N/A	N/A	N/A	N/A
186	*Paa shini*	Spiny-flanked Frog			VU			+			No	N/A	N/A	N/A	N/A
187	*Paa spinosa*	Giant Spiny Frog			VU			+		+	Yes	No	No	N/A	N/A
188	*Paa yunnanensis*	Yunnan Spiny Frog		EN				+		+	Yes	No	No	N/A	N/A
189	*Paramesotriton deloustali*	Vietnamese Salamander			VU					+	Yes	No	No	N/A	N/A
190	*Paramesotriton guangxiensis*	Guangxi Warty Newt			VU			+		+	Yes	No	Yes	Medium	Medium
191	*Pelophryne scalpta*	Hainan Little Toad			VU			+			Yes	No	No	N/A	N/A
192	*Philautus jinxiuensis*	Jinxiu Small Treefrog			VU			+		+	Yes	No	No	N/A	N/A
193	*Philautus ocellatus*	Ocellated Small Treefrog			VU			+			Yes	No	No	N/A	N/A
194	*Philautus rhododiscus*	Red-disked Small Treefrog			VU			+			Yes	No	No	N/A	N/A
195	*Philautus romeri*	Romer's Treefrog			VU			+			Yes	No	No	N/A	N/A
196	*Polypedates hungfuensis*	Hungfu Treefrog			VU					+	Yes	No	No	N/A	N/A
197	*Polypedates yaoshanensis*	Yaoshan Treefrog			VU			+			No	N/A	N/A	N/A	N/A
198	*Rana attigua*	frog species			VU		+			+	Yes	No	No	N/A	N/A
199	*Rana bannanica*	frog species			VU			+			Yes	No	No	N/A	N/A

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200	*Rana hainanensis*	Hainan Torrent Frog			VU			+			Yes	No	No	N/A	N/A
201	*Rana hejiangensis*	Hejiang Odorous Frog			VU			+			No	N/A	N/A	N/A	N/A
202	*Rana jingdongensis*	Jingdong Frog			VU			+			Yes	No	No	N/A	N/A
203	*Rana tiannanensis*	Tiannan Odorous Frog			VU			+			Yes	No	No	N/A	N/A
204	*Rhacophorus annamensis*	Annam Flying Frog			VU	+				+	Yes	No	No	N/A	N/A
205	*Rhacophorus baliogaster*	treefrog species			VU		+			+	Yes	No	No	N/A	N/A
206	*Rhacophorus exechopygus*	treefrog species			VU		+			+	Yes	No	No	N/A	N/A
207	*Theloderma corticale*	Mossy Frog			VU					+	Yes	No	No	N/A	N/A
208	*Theloderma gordoni*	Large Warted Treefrog			VU				+	+	Yes	No	No	N/A	N/A
209	*Theloderma stellatum*	Chantaburi Warted Treefrog			VU				+	+	Yes	No	No	N/A	N/A
210	*Tylototriton hainanensis*	Hainan Knobby Newt		EN				+			Yes	No	No	N/A	N/A
211	*Vibrissaphora echinata*	Hoang Lien Moustache Toad		EN						+	Yes	No	No	N/A	N/A
212	*Xenophrys brachykolos*	Short-legged Toad		EN				+		+	Yes	No	No	N/A	N/A
	FISH		**3**	**9**	**20**	**9**	**10**	**15**	**18**	**7**					
213	*Acipenser sinensis*	Chinese Sturgeon		EN				+			Yes	Yes	No	High	Medium
214	*Betta simplex*	Simple Mouthbrooder			VU				+		Yes	No	No	N/A	N/A
215	*Botia sidthimunki*	Dwarf Botia	CR			+	+		+		Yes	Yes	No	Medium	Medium
216	*Chela caeruleostigmata*	Leaping Barb	CR			+	+		+	+	Yes	Yes	No	Medium	Medium
217	*Dasyatis laosensis*	Mekong Freshwater Stingray		EN		+	+		+	+	Yes	Yes	No	High	High
218	*Gibbibarbus cyphotergous*	Golden-line fish species			VU			+			Yes	No	No	N/A	N/A
219	*Himantura chaophraya*	Giant Freshwater Stingray		EN					+		Yes	Yes	No	High	High
220	*Himantura oxyrhynchus*	Marbled Freshwater Stingray		EN		+	+		+		Yes	Yes	No	High	High

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221	*Himantura signifer*	White-edged Freshwater Whipray		EN			+		+		Yes	Yes	No	High	High
222	*Homaloptera thamicola*	Waterfall-climbing Cave Loach			VU				+		Yes	No	No	N/A	N/A
223	*Nemacheilus troglocataractus*	cave loach species			VU				+		Yes	No	No	N/A	N/A
224	*Oreoglanis siamensis*	Freshwater Batfish			VU				+		Yes	No	No	N/A	N/A
225	*Oreonectes anophthalmus*	cave loach species			VU			+			Yes	No	No	N/A	N/A
226	*Pangasianodon gigas*	Giant Catfish		EN		+	+	+	+	+	Yes	Yes	No	High	High
227	*Pristis microdon*	Freshwater Sawfish	CR			+	+		+	+	Yes	Yes	No	High	High
228	*Probarbus jullieni*	Jullien's Golden Carp		EN		+	+		+	+	Yes	Yes	No	High	High
229	*Protocobitis typhlops*	cave loach species			VU			+			Yes	No	No	N/A	N/A
230	*Puntius speleops*	blind cavefish species			VU				+		Yes	No	No	N/A	N/A
231	*Schistura jarutanini*	Srisawat Blind Cave Loach			VU				+		Yes	No	No	N/A	N/A
232	*Schistura oedipus*	blind cave loach species			VU				+		Yes	No	No	N/A	N/A
233	*Scleropages formosus*	Asian Arowana		EN		+	+		+	+	Yes	Yes	No	Medium	Medium
234	*Sinocyclocheilus anatirostris*	Duck-billed Golden-line Fish			VU			+			Yes	No	No	N/A	N/A
235	*Sinocyclocheilus angularis*	Golden-line Angle Fish			VU			+			Yes	No	No	N/A	N/A
236	*Sinocyclocheilus anophthalmus*	Eyeless Golden-line Fish			VU			+			Yes	No	No	N/A	N/A
237	*Sinocyclocheilus hyalinus*	Hyaline Fish			VU			+			Yes	No	No	N/A	N/A
238	*Sinocyclocheilus microphthalmus*	Small-eyed Golden-line Fish			VU			+			Yes	No	No	N/A	N/A
239	*Sphaerophysa dianchiensis*	loach species			VU			+			Yes	No	No	N/A	N/A
240	*Tenualosa thibaudeaui*	Laotian Shad		EN		+	+		+	+	Yes	Yes	No	High	High
241	*Triplophysa gejiuensis*	Gejiu Blind Loach			VU			+			Yes	No	No	N/A	N/A

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242	*Triplophysa xiangxensis*	blind loach species			VU			+			Yes	No	No	N/A	N/A
243	*Yunnanilus macrogaster*	loach species			VU			+			Yes	No	No	N/A	N/A
244	*Yunnanilus niger*	loach species			VU			+			Yes	No	No	N/A	N/A
	PLANTS		**51**	**64**	**132**	**32**	**21**	**116**	**83**	**131**					
245	*Abies yuanbaoshanensis*		CR					+			N/A	N/A	N/A	N/A	N/A
246	*Abies ziyuanensis*		CR					+			N/A	N/A	N/A	N/A	N/A
247	*Actinodaphne ellipticbacca*				VU					+	N/A	N/A	N/A	N/A	N/A
248	*Aesculus wangii*				VU			+		+	N/A	N/A	N/A	N/A	N/A
249	*Afzelia xylocarpa*			EN		+	+		+	+	N/A	N/A	N/A	N/A	N/A
250	*Aglaia chittagonga*				VU				+		N/A	N/A	N/A	N/A	N/A
251	*Aglaia perviridis*				VU			+	+	+	N/A	N/A	N/A	N/A	N/A
252	*Aglaia pleuropteris*		CR			+				+	N/A	N/A	N/A	N/A	N/A
253	*Aglaia tenuicaulis*		CR						+		N/A	N/A	N/A	N/A	N/A
254	*Alleizettella rubra*				VU					+	N/A	N/A	N/A	N/A	N/A
255	*Alseodaphne hainanensis*				VU			+		+	N/A	N/A	N/A	N/A	N/A
256	*Alseodaphne rugosa*			EN				+			N/A	N/A	N/A	N/A	N/A
257	*Alstonia annamensis*			EN						+	N/A	N/A	N/A	N/A	N/A
258	*Amentotaxus poilanei*				VU					+	N/A	N/A	N/A	N/A	N/A
259	*Amentotaxus yunnanensis*			EN				+		+	N/A	N/A	N/A	N/A	N/A
260	*Amoora dasyclada*				VU			+		+	N/A	N/A	N/A	N/A	N/A
261	*Anisoptera costata*			EN		+			+	+	N/A	N/A	N/A	N/A	N/A
262	*Anisoptera curtisii*			EN					+		N/A	N/A	N/A	N/A	N/A
263	*Anisoptera scaphula*		CR						+	+	N/A	N/A	N/A	N/A	N/A
264	*Annamocarya sinensis*			EN				+		+	N/A	N/A	N/A	N/A	N/A

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265	*Apterosperma oblata*				VU			+			N/A	N/A	N/A	N/A	N/A
266	*Aquilaria banaensae*				VU					+	N/A	N/A	N/A	N/A	N/A
267	*Aquilaria crassna*		CR			+	+		+	+	N/A	N/A	N/A	N/A	N/A
268	*Aquilaria malaccensis*				VU				+		N/A	N/A	N/A	N/A	N/A
269	*Aquilaria sinensis*				VU			+			N/A	N/A	N/A	N/A	N/A
270	*Artocarpus hypargyreus*				VU			+			N/A	N/A	N/A	N/A	N/A
271	*Bennettiodendron cordatum*				VU					+	N/A	N/A	N/A	N/A	N/A
272	*Bhesa sinica*		CR					+			N/A	N/A	N/A	N/A	N/A
273	*Borassodendron machadonis*				VU				+		N/A	N/A	N/A	N/A	N/A
274	*Bretschneidera sinensis*			EN				+		+	N/A	N/A	N/A	N/A	N/A
275	*Burretiodendron esquirolii*				VU			+	+		N/A	N/A	N/A	N/A	N/A
276	*Burretiodendron hsienmu*				VU			+			N/A	N/A	N/A	N/A	N/A
277	*Burretiodendron tonkinense*			EN				+		+	N/A	N/A	N/A	N/A	N/A
278	*Bursera tonkinensis*				VU					+	N/A	N/A	N/A	N/A	N/A
279	*Caesalpinia nhatrangense*				VU					+	N/A	N/A	N/A	N/A	N/A
280	*Calocedrus macrolepis*				VU			+	+	+	N/A	N/A	N/A	N/A	N/A
281	*Camellia chrysantha*				VU			+		+	N/A	N/A	N/A	N/A	N/A
282	*Camellia crapnelliana*				VU			+			N/A	N/A	N/A	N/A	N/A
283	*Camellia euphlebia*				VU			+		+	N/A	N/A	N/A	N/A	N/A
284	*Camellia fleuryi*				VU					+	N/A	N/A	N/A	N/A	N/A
285	*Camellia gilbertii*				VU					+	N/A	N/A	N/A	N/A	N/A
286	*Camellia grijsii*				VU			+			N/A	N/A	N/A	N/A	N/A
287	*Camellia pleurocarpa*				VU					+	N/A	N/A	N/A	N/A	N/A
288	*Camellia pubipetala*				VU			+			N/A	N/A	N/A	N/A	N/A

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289	*Camellia tunghinensis*				VU			+			N/A	N/A	N/A	N/A	N/A
290	*Canarium pseudodecumanum*				VU				+		N/A	N/A	N/A	N/A	N/A
291	*Castanopsis concinna*				VU			+			N/A	N/A	N/A	N/A	N/A
292	*Cephalomappa sinensis*				VU			+		+	N/A	N/A	N/A	N/A	N/A
293	*Cephalotaxus hainanensis*			EN				+			N/A	N/A	N/A	N/A	N/A
294	*Cephalotaxus mannii*				VU			+		+	N/A	N/A	N/A	N/A	N/A
295	*Cephalotaxus oliveri*				VU			+			N/A	N/A	N/A	N/A	N/A
296	*Chunia bucklandioides*				VU			+			N/A	N/A	N/A	N/A	N/A
297	*Cinnamomum balansae*			EN						+	N/A	N/A	N/A	N/A	N/A
298	*Cleidiocarpon cavaleriei*				VU			+		+	N/A	N/A	N/A	N/A	N/A
299	*Cleidiocarpon laurinum*			EN						+	N/A	N/A	N/A	N/A	N/A
300	*Cleistanthus petelotii*				VU					+	N/A	N/A	N/A	N/A	N/A
301	*Corylus chinensis*			EN				+			N/A	N/A	N/A	N/A	N/A
302	*Cotylelobium lanceolatum*				VU				+		N/A	N/A	N/A	N/A	N/A
303	*Craibiodendron scleranthum*				VU					+	N/A	N/A	N/A	N/A	N/A
304	*Craigia yunnanensis*			EN				+		+	N/A	N/A	N/A	N/A	N/A
305	*Croton phuquocensis*				VU					+	N/A	N/A	N/A	N/A	N/A
306	*Croton touranensis*				VU					+	N/A	N/A	N/A	N/A	N/A
307	*Crudia lanceolata*				VU				+		N/A	N/A	N/A	N/A	N/A
308	*Cunninghamia konishii*				VU		+			+	N/A	N/A	N/A	N/A	N/A
309	*Cupressus duclouxiana*			EN				+			N/A	N/A	N/A	N/A	N/A
310	*Cycas siamensis*				VU	+			+	+	N/A	N/A	N/A	N/A	N/A
311	*Cynometra inaequifolia*				VU				+		N/A	N/A	N/A	N/A	N/A
312	*Dalbergia annamensis*			EN						+	N/A	N/A	N/A	N/A	N/A

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313	*Dalbergia balansae*				VU			+		+	N/A	N/A	N/A	N/A	N/A
314	*Dalbergia bariensis*			EN		+	+		+	+	N/A	N/A	N/A	N/A	N/A
315	*Dalbergia cambodiana*			EN		+				+	N/A	N/A	N/A	N/A	N/A
316	*Dalbergia cochinchinensis*				VU	+	+		+	+	N/A	N/A	N/A	N/A	N/A
317	*Dalbergia mammosa*			EN						+	N/A	N/A	N/A	N/A	N/A
318	*Dalbergia odorifera*				VU			+			N/A	N/A	N/A	N/A	N/A
319	*Dalbergia oliveri*			EN					+	+	N/A	N/A	N/A	N/A	N/A
320	*Dalbergia tonkinensis*				VU			+		+	N/A	N/A	N/A	N/A	N/A
321	*Diospyros mun*		CR				+			+	N/A	N/A	N/A	N/A	N/A
322	*Diospyros vaccinioides*		CR					+			N/A	N/A	N/A	N/A	N/A
323	*Diplopanax stachyanthus*				VU			+		+	N/A	N/A	N/A	N/A	N/A
324	*Dipterocarpus alatus*			EN		+	+		+	+	N/A	N/A	N/A	N/A	N/A
325	*Dipterocarpus baudii*		CR			+			+	+	N/A	N/A	N/A	N/A	N/A
326	*Dipterocarpus chartaceus*		CR						+		N/A	N/A	N/A	N/A	N/A
327	*Dipterocarpus costatus*			EN		+	+		+	+	N/A	N/A	N/A	N/A	N/A
328	*Dipterocarpus crinitus*			EN					+		N/A	N/A	N/A	N/A	N/A
329	*Dipterocarpus dyeri*		CR			+			+	+	N/A	N/A	N/A	N/A	N/A
330	*Dipterocarpus gracilis*		CR					+	+		N/A	N/A	N/A	N/A	N/A
331	*Dipterocarpus grandiflorus*		CR						+	+	N/A	N/A	N/A	N/A	N/A
332	*Dipterocarpus hasseltii*		CR						+	+	N/A	N/A	N/A	N/A	N/A
333	*Dipterocarpus kerrii*		CR						+	+	N/A	N/A	N/A	N/A	N/A
334	*Dipterocarpus retusus*				VU			+	+	+	N/A	N/A	N/A	N/A	N/A
335	*Dipterocarpus turbinatus*		CR			+	+	+	+	+	N/A	N/A	N/A	N/A	N/A
336	*Dipteronia dyeriana*			EN				+			N/A	N/A	N/A	N/A	N/A
337	*Dysosma versipellis*				VU			+			N/A	N/A	N/A	N/A	N/A

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338	*Elaeocarpus apiculatus*				VU					+	N/A	N/A	N/A	N/A	N/A
339	*Endocomia canarioides*				VU				+	+	N/A	N/A	N/A	N/A	N/A
340	*Erythrophleum fordii*			EN				+		+	N/A	N/A	N/A	N/A	N/A
341	*Eunonymus lanceifolia*				VU			+			N/A	N/A	N/A	N/A	N/A
342	*Euryodendron excelsum*		CR					+			N/A	N/A	N/A	N/A	N/A
343	*Fagus longipetiolata*				VU			+		+	N/A	N/A	N/A	N/A	N/A
344	*Firmiana hainanensis*				VU			+			N/A	N/A	N/A	N/A	N/A
345	*Fordia pauciflora*				VU				+		N/A	N/A	N/A	N/A	N/A
346	*Garcinia paucinervis*			EN				+		+	N/A	N/A	N/A	N/A	N/A
347	*Gmelina hainanensis*				VU			+		+	N/A	N/A	N/A	N/A	N/A
348	*Goniothalamus macrocalyx*				VU					+	N/A	N/A	N/A	N/A	N/A
349	*Halesia macgregorii*				VU			+			N/A	N/A	N/A	N/A	N/A
350	*Helicia grandifolia*				VU					+	N/A	N/A	N/A	N/A	N/A
351	*Helicia shweliensis*			EN				+			N/A	N/A	N/A	N/A	N/A
352	*Heritiera parvifolia*				VU			+			N/A	N/A	N/A	N/A	N/A
353	*Hopea apiculata*		CR						+		N/A	N/A	N/A	N/A	N/A
354	*Hopea beccariana*		CR						+		N/A	N/A	N/A	N/A	N/A
355	*Hopea chinensis*		CR					+		+	N/A	N/A	N/A	N/A	N/A
356	*Hopea cordata*		CR							+	N/A	N/A	N/A	N/A	N/A
357	*Hopea exalata*				VU			+			N/A	N/A	N/A	N/A	N/A
358	*Hopea ferrea*			EN		+			+	+	N/A	N/A	N/A	N/A	N/A
359	*Hopea griffithii*				VU				+		N/A	N/A	N/A	N/A	N/A
360	*Hopea hainanensis*		CR					+		+	N/A	N/A	N/A	N/A	N/A
361	*Hopea helferi*		CR			+			+		N/A	N/A	N/A	N/A	N/A
362	*Hopea hongayanensis*		CR							+	N/A	N/A	N/A	N/A	N/A

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363	*Hopea latifolia*		CR			+			+		N/A	N/A	N/A	N/A	N/A
364	*Hopea mollissima*		CR					+		+	N/A	N/A	N/A	N/A	N/A
365	*Hopea odorata*				VU	+	+		+	+	N/A	N/A	N/A	N/A	N/A
366	*Hopea pedicellata*			EN		+			+		N/A	N/A	N/A	N/A	N/A
367	*Hopea pierrei*			EN		+	+		+	+	N/A	N/A	N/A	N/A	N/A
368	*Hopea recopei*			EN		+	+		+	+	N/A	N/A	N/A	N/A	N/A
369	*Hopea reticulata*		CR						+	+	N/A	N/A	N/A	N/A	N/A
370	*Hopea sangal*		CR						+		N/A	N/A	N/A	N/A	N/A
371	*Hopea siamensis*		CR			+			+	+	N/A	N/A	N/A	N/A	N/A
372	*Hopea thorelii*		CR				+		+		N/A	N/A	N/A	N/A	N/A
373	*Horsfieldia longiflora*				VU					+	N/A	N/A	N/A	N/A	N/A
374	*Horsfieldia pandurifolia*			EN				+			N/A	N/A	N/A	N/A	N/A
375	*Huodendron parviflorum*				VU					+	N/A	N/A	N/A	N/A	N/A
376	*Hydnocarpus hainanensis*				VU			+		+	N/A	N/A	N/A	N/A	N/A
377	*Illicium ternstroemioides*				VU			+		+	N/A	N/A	N/A	N/A	N/A
378	*Intsia bijuga*				VU	+			+	+	N/A	N/A	N/A	N/A	N/A
379	*Ixonanthes chinensis*				VU			+		+	N/A	N/A	N/A	N/A	N/A
380	*Knema austrosiamensis*				VU				+		N/A	N/A	N/A	N/A	N/A
381	*Knema conica*				VU				+		N/A	N/A	N/A	N/A	N/A
382	*Knema hookerana*				VU				+		N/A	N/A	N/A	N/A	N/A
383	*Knema mixta*				VU					+	N/A	N/A	N/A	N/A	N/A
384	*Knema pachycarpa*				VU					+	N/A	N/A	N/A	N/A	N/A
385	*Knema pierrei*				VU					+	N/A	N/A	N/A	N/A	N/A
386	*Knema poilanei*				VU					+	N/A	N/A	N/A	N/A	N/A
387	*Knema saxatilis*				VU					+	N/A	N/A	N/A	N/A	N/A

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388	*Knema sessiflora*				VU					+	N/A	N/A	N/A	N/A	N/A
389	*Knema squamulosa*				VU					+	N/A	N/A	N/A	N/A	N/A
390	*Knema tonkinensis*				VU		+			+	N/A	N/A	N/A	N/A	N/A
391	*Lagerstroemia intermedia*				VU			+	+		N/A	N/A	N/A	N/A	N/A
392	*Laportea urentissima*			EN				+		+	N/A	N/A	N/A	N/A	N/A
393	*Larix mastersiana*				VU			+			N/A	N/A	N/A	N/A	N/A
394	*Litsea dilleniifolia*			EN				+			N/A	N/A	N/A	N/A	N/A
395	*Madhuca hainanensis*				VU			+			N/A	N/A	N/A	N/A	N/A
396	*Madhuca pasquieri*				VU			+		+	N/A	N/A	N/A	N/A	N/A
397	*Magnolia delavayi*			EN				+			N/A	N/A	N/A	N/A	N/A
398	*Magnolia phanerophlebia*			EN				+			N/A	N/A	N/A	N/A	N/A
399	*Magnolia sargentiana*			EN				+			N/A	N/A	N/A	N/A	N/A
400	*Malania oleifera*				VU			+			N/A	N/A	N/A	N/A	N/A
401	*Mangifera dongnaiensis*			EN						+	N/A	N/A	N/A	N/A	N/A
402	*Mangifera flava*				VU	+				+	N/A	N/A	N/A	N/A	N/A
403	*Mangifera minutifolia*				VU					+	N/A	N/A	N/A	N/A	N/A
404	*Mangifera macrocarpa*				VU				+		N/A	N/A	N/A	N/A	N/A
405	*Mangifera pentandra*				VU				+		N/A	N/A	N/A	N/A	N/A
406	*Manglietia aromatica*				VU			+		+	N/A	N/A	N/A	N/A	N/A
407	*Manglietia grandis*				VU			+			N/A	N/A	N/A	N/A	N/A
408	*Manglietia megaphylla*				VU			+			N/A	N/A	N/A	N/A	N/A
409	*Manglietia ovoidea*			EN				+			N/A	N/A	N/A	N/A	N/A
410	*Manglietia sinica*		CR					+			N/A	N/A	N/A	N/A	N/A
411	*Maytenus curtissii*				VU				+		N/A	N/A	N/A	N/A	N/A
412	*Meiogyne hainanensis*				VU			+			N/A	N/A	N/A	N/A	N/A

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413	*Merrillia caloxylon*				VU				+		N/A	N/A	N/A	N/A	N/A
414	*Michelia aenea*			EN				+		+	N/A	N/A	N/A	N/A	N/A
415	*Michelia coriacea*			EN				+			N/A	N/A	N/A	N/A	N/A
416	*Michelia hypolampra*				VU			+			N/A	N/A	N/A	N/A	N/A
417	*Michelia ingrata*			EN				+			N/A	N/A	N/A	N/A	N/A
418	*Michelia xanthantha*			EN				+			N/A	N/A	N/A	N/A	N/A
419	*Mouretia tonkinensis*				VU					+	N/A	N/A	N/A	N/A	N/A
420	*Myristica yunnanensis*		CR					+			N/A	N/A	N/A	N/A	N/A
421	*Neobalanocarpus heimii*				VU				+		N/A	N/A	N/A	N/A	N/A
422	*Nothotsuga longibracteata*			EN				+			N/A	N/A	N/A	N/A	N/A
423	*Nyssa yunnanensis*		CR					+			N/A	N/A	N/A	N/A	N/A
424	*Palaquium impressinervium*				VU				+		N/A	N/A	N/A	N/A	N/A
425	*Paranephelium hainanensis*			EN				+			N/A	N/A	N/A	N/A	N/A
426	*Parashorea chinensis*			EN				+		+	N/A	N/A	N/A	N/A	N/A
427	*Parashorea stellata*		CR						+	+	N/A	N/A	N/A	N/A	N/A
428	*Pellacalyx yunnanensis*			EN				+			N/A	N/A	N/A	N/A	N/A
429	*Phoebe nanmu*			EN				+			N/A	N/A	N/A	N/A	N/A
430	*Phoebe poilanei*				VU					+	N/A	N/A	N/A	N/A	N/A
431	*Pholidocarpus macrocarpus*				VU				+		N/A	N/A	N/A	N/A	N/A
432	*Photinia lasiogyna*				VU			+			N/A	N/A	N/A	N/A	N/A
433	*Picea brachytyla*				VU			+			N/A	N/A	N/A	N/A	N/A
434	*Picea farreri*			EN				+			N/A	N/A	N/A	N/A	N/A
435	*Pinus dalatensis*				VU		+			+	N/A	N/A	N/A	N/A	N/A
436	*Pinus krempfii*				VU					+	N/A	N/A	N/A	N/A	N/A

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437	*Pinus kwangtungensis*				VU					+	N/A	N/A	N/A	N/A	N/A
438	*Pinus merkusii*				VU	+	+			+	N/A	N/A	N/A	N/A	N/A
439	*Pinus squamata*		CR					+			N/A	N/A	N/A	N/A	N/A
440	*Pinus wangii*			EN				+		+	N/A	N/A	N/A	N/A	N/A
441	*Pistacia cucphuongensis*				VU					+	N/A	N/A	N/A	N/A	N/A
442	*Platanus kerrii*				VU		+			+	N/A	N/A	N/A	N/A	N/A
443	*Potameia lotungensis*				VU			+		+	N/A	N/A	N/A	N/A	N/A
444	*Premna szemaoensis*				VU			+			N/A	N/A	N/A	N/A	N/A
445	*Pseudotaxus chienii*			EN				+			N/A	N/A	N/A	N/A	N/A
446	*Pterocarpus indicus*				VU	+			+	+	N/A	N/A	N/A	N/A	N/A
447	*Pterospermum kingtungense*		CR					+			N/A	N/A	N/A	N/A	N/A
448	*Pterospermum menglunense*		CR					+			N/A	N/A	N/A	N/A	N/A
449	*Pterospermum yunnanense*		CR					+			N/A	N/A	N/A	N/A	N/A
450	*Pterostyrax psilophylla*				VU			+			N/A	N/A	N/A	N/A	N/A
451	*Reevesia rotundifolia*		CR					+			N/A	N/A	N/A	N/A	N/A
452	*Rhoiptelea chiliantha*				VU			+		+	N/A	N/A	N/A	N/A	N/A
453	*Saccopetalum prolificum*				VU			+			N/A	N/A	N/A	N/A	N/A
454	*Santalum album*				VU			+			N/A	N/A	N/A	N/A	N/A
455	*Scaphophyllum speciosum*				VU			+			N/A	N/A	N/A	N/A	N/A
456	*Schefflera chapana*				VU			+		+	N/A	N/A	N/A	N/A	N/A
457	*Schefflera kontumensis*			EN						+	N/A	N/A	N/A	N/A	N/A
458	*Schefflera palmiformis*			EN						+	N/A	N/A	N/A	N/A	N/A
459	*Shistochila macrodonta*			EN				+			N/A	N/A	N/A	N/A	N/A
460	*Shorea faguetiana*			EN					+		N/A	N/A	N/A	N/A	N/A

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461	*Shorea falcata*		CR							+	N/A	N/A	N/A	N/A	N/A
462	*Shorea farinosa*		CR						+		N/A	N/A	N/A	N/A	N/A
463	*Shorea foxworthyi*		CR						+		N/A	N/A	N/A	N/A	N/A
464	*Shorea glauca*			EN					+		N/A	N/A	N/A	N/A	N/A
465	*Shorea gratissima*			EN					+		N/A	N/A	N/A	N/A	N/A
466	*Shorea guiso*		CR						+	+	N/A	N/A	N/A	N/A	N/A
467	*Shorea henryana*			EN		+	+		+	+	N/A	N/A	N/A	N/A	N/A
468	*Shorea hypochra*		CR			+			+	+	N/A	N/A	N/A	N/A	N/A
469	*Shorea leprosula*			EN					+		N/A	N/A	N/A	N/A	N/A
470	*Shorea roxburghii*			EN		+	+		+	+	N/A	N/A	N/A	N/A	N/A
472	*Shorea singkawang*		CR						+		N/A	N/A	N/A	N/A	N/A
472	*Shorea sumatrana*		CR						+		N/A	N/A	N/A	N/A	N/A
473	*Shorea thorelii*		CR			+	+		+	+	N/A	N/A	N/A	N/A	N/A
474	*Sinoradlkofera minor*				VU					+	N/A	N/A	N/A	N/A	N/A
475	*Styrax litseoides*				VU					+	N/A	N/A	N/A	N/A	N/A
476	*Taiwania cryptomerioides*				VU			+		+	N/A	N/A	N/A	N/A	N/A
477	*Tapiscia sinensis*				VU			+			N/A	N/A	N/A	N/A	N/A
478	*Taraktogenos annamensis*				VU		+	+		+	N/A	N/A	N/A	N/A	N/A
479	*Tetrathyrium subcordatum*				VU			+			N/A	N/A	N/A	N/A	N/A
480	*Trigonostemon fragilis*				VU					+	N/A	N/A	N/A	N/A	N/A
481	*Vatica cinerea*			EN		+			+	+	N/A	N/A	N/A	N/A	N/A
482	*Vatica diospyroides*		CR						+	+	N/A	N/A	N/A	N/A	N/A
483	*Vatica guangxiensis*		CR					+			N/A	N/A	N/A	N/A	N/A
484	*Vatica mangachapoi*			EN				+	+	+	N/A	N/A	N/A	N/A	N/A
485	*Vatica pauciflora*			EN					+		N/A	N/A	N/A	N/A	N/A

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486	*Vatica stapfiana*			EN					+		N/A	N/A	N/A	N/A	N/A
487	*Vatica xishuangbannaensis*		CR					+			N/A	N/A	N/A	N/A	N/A
488	*Vitex ajugaeflora*				VU					+	N/A	N/A	N/A	N/A	N/A
489	*Wrightia lanceolata*				VU				+		N/A	N/A	N/A	N/A	N/A
490	*Wrightia lecomtei*				VU	+			+		N/A	N/A	N/A	N/A	N/A
491	*Wrightia viridifolia*				VU				+		N/A	N/A	N/A	N/A	N/A
492	*Xylopia pierrei*				VU	+				+	N/A	N/A	N/A	N/A	N/A
	Total		**82**	**131**	**279**	**104**	**102**	**235**	**204**	**265**					

Appendix 2. Key Biodiversity Areas in Indochina

No.	Key Biodiversity Area	Mammals	Birds	Reptiles	Amphibians	Fish	Plants	Protected Area*	Key Biodiversity Area within a Priority Corridor
	CAMBODIA								
1	Ang Tropeang Thmor	+	+	+				PA	No
2	Bassac Marsh		+						No
3	Basset Marsh		+						Mekong River and Major Tributaries
4	Boeung Chhmar-Moat Khla		+	+				PA	No
5	Boeung Prek Lapouv		+						No
6	Boeung Veal Samnap		+						Mekong River and Major Tributaries
7	Central Cambodia Lowlands	+							No
8	Central Cardamoms	+	+	+		+	+	PA	No
9	Chhep	+	+	+			+	PA	No
10	Chhnuk Tru		+	+				PA	No
11	Dei Roneat		+	+				PA	No
12	Kampong Trach		+						No
13	Kirirom	+	+	+			+	PA	No
14	Koh Kapik		+					PA	No
15	Koh Tang Archipelago		+						No
16	Lomphat	+	+	+				PA	No
17	Lower Stung Sen		+	+				PA	No
18	Mekong from Kratie to Lao P.D.R.		+	+		+	+		Mekong River and Major Tributaries
19	Mondulkiri-Kratie Lowlands	+	+	+				PA	No
20	Northern Santuk		+						No
21	O Skach	+	+	+					No
22	Preah Net Preah-Kra Lanh-Pourk		+						No
23	Phnom Aural	+	+				+	PA	No
24	Phnom Bokor	+	+				+	PA	No
25	Phnom Samkos	+	+					PA	No
26	Prek Taek Sap		+					PA	No
27	Prek Toal	+	+					PA	No
28	Sekong River		+	+					Mekong River and Major Tributaries
29	Sesan River		+	+					Mekong River and Major Tributaries
30	Snoul-Keo Sema-O Reang	+	+	+				PA	No

No.	Key Biodiversity Area	Mammals	Birds	Reptiles	Amphibians	Fish	Plants	Protected Area*	Key Biodiversity Area within a Priority Corridor
31	Sre Ambel	+	+	+				PA	No
32	Stung-Chi Kreng-Kampong Svay		+						No
33	Stung Kampong Smach		+						No
34	Stung-Prasat Balang		+	+					No
35	Stung Sen-Santuk-Baray		+						No
36	Upper Srepok Catchment	+	+	+				PA	No
37	Upper Stung Sen Catchment	+	+	+			+	PA	No
38	Veal Srongae		+					PA	No
39	Virachey	+	+	+			+	PA	No
40	Western Siem Pang	+	+	+					No
	LAO P.D.R.								
41	Attapeu Plain		+						No
42	Bolaven Plateau North-east	+							No
43	Chonbuly	+							No
44	Dakchung Plateau	+	+	+					No
45	Dong Ampham	+	+				+	PA	No
46	Dong Hua Sao	+		+				PA	No
47	Dong Khanthung	+	+	+			+		No
48	Dong Phou Vieng	+		+				PA	No
49	Hin Namno	+	+	+			+	PA	No
50	Khammouane	+	+	+			+	PA	No
51	Mekong from Phou Xiang Thong to Siphandon		+			+			Mekong River and Major Tributaries
52	Mekong Upstream of Vientiane		+			+			Mekong River and Major Tributaries
53	Nakai-Nam Theun	+	+	+			+	PA	No
54	Nakai Plateau	+	+	+				PA	No
55	Nam Chat-Nam Pan	+	+						No
56	Nam Et	+		+				PA	No
57	Nam Ghong	+		+					No
58	Nam Ha	+						PA	No
59	Nam Kading	+		+				PA	No
60	Nam Kan	+							No
61	Nam Phoun	+						PA	No
62	Nam Xam	+	+					PA	No
63	Nong Khe Wetlands			+					No
64	Phou Ahyon	+	+						No

No.	Key Biodiversity Area	Mammals	Birds	Reptiles	Amphibians	Fish	Plants	Protected Area*	Key Biodiversity Area within a Priority Corridor
65	Phou Dendin	+	+					PA	No
66	Phou Kathong	+							No
67	Phou Khao Khoay	+	+	+				PA	No
68	Phou Louey	+	+					PA	No
69	Phou Xang He	+		+			+	PA	No
70	Phou Xiang Thong	+	+	+				PA	No
71	Siphandon	+	+	+		+			Mekong River and Major Tributaries
72	Upper Lao Mekong		+			+			Mekong River and Major Tributaries
73	Upper Xe Bangfai	+	+						No
74	Upper Xe Khaman		+					PA	Mekong River and Major Tributaries
75	Xe Bang Nouan	+		+				PA	No
76	Xe Khampho-Xe Pian		+					PA	No
77	Xe Pian	+	+	+			+	PA	No
78	Xe Sap	+	+	+	+		+	PA	No
	SOUTHERN CHINA								
79	Babianjiang	+					+		No
80	Baixu-Qinpai		+						No
81	Bawangling	+	+	+	+		+	PA	No
82	Caiyanghe	+	+	+			+	PA	No
83	Chongzuo	+					+	PA	No
84	Chunxiu	+						PA	No
85	Damingshan	+	+				+	PA	No
86	Datian	+						PA	No
87	Daweishan	+			+		+	PA	No
88	Dawuling	+					+	PA	No
89	Dehong Zizhizhou		+					PA	No
90	Diaoluoshan	+	+	+	+		+	PA	No
91	Diding	+						PA	Northern Highlands Limestone
92	Dongzhaigang		+					PA	No
93	Fangcheng		+					PA	No
94	Fangcheng Shangyue						+	PA	No
95	Fanjia			+			+	PA	No
96	Fenshuiling	+		+	+		+	PA	No
97	Fusui-Bapen	+	+					PA	No

No.	Key Biodiversity Area	Mammals	Birds	Reptiles	Amphibians	Fish	Plants	Protected Area*	Key Biodiversity Area within a Priority Corridor
98	Fusui-Nahuang		+					PA	No
99	Futian		+					PA	No
100	Ganshiling		+				+	PA	No
101	Gulongshan		+				+	PA	Northern Highlands Limestone
102	Heweishan						+		No
103	Hong Kong Island and Associated Islands	+		+	+		+	PA	No
104	Houmiling						+	PA	No
105	Huanglianshan	+	+		+		+	PA	No
106	Inland New Territories	+	+	+	+		+	PA	No
107	Jianfengling	+	+	+	+		+	PA	No
108	Jianling						+	PA	No
109	Jiaxi	+	+	+	+		+	PA	No
110	Lantau Island and Associated Islands			+	+		+	PA	No
111	Leizhou Peninsula		+						No
112	Liji						+	PA	No
113	Limushan		+		+		+	PA	No
114	Longhua		+					PA	No
115	Longhushan		+					PA	No
116	Longshan Section of Nonggang	+					+	PA	No
117	Lotung						+		No
118	Mai Po and Inner Deep Bay	+	+	+			+	PA	No
119	Nangliujiang Hekou		+						No
120	Nangunhe	+	+		+		+		No
121	Nanmaoling		+	+					No
122	Nanweiling		+					PA	No
123	Nonggang	+	+				+	PA	No
124	Nongxin	+						PA	Northern Highlands Limestone
125	Paiyangshan				+				No
126	Qixingkeng	+					+	PA	No
127	Sanya						+		No
128	Shangsi-Biannian		+					PA	No
129	Shangxi				+		+	PA	No
130	Shankou		+					PA	No
131	Shenzhen Wutongshan						+	PA	No
132	Shiwandashan	+	+	+			+	PA	No

No.	Key Biodiversity Area	Mammals	Birds	Reptiles	Amphibians	Fish	Plants	Protected Area*	Key Biodiversity Area within a Priority Corridor
133	Taipa-Coloane		+				+		No
134	Tongbiguan	+	+				+	PA	No
135	Tongtieling	+					+	PA	No
136	Wanling			+					No
137	Weizhou Dao		+					PA	No
138	Wuzhishan	+	+		+		+	PA	No
139	Xianhu Reservoir		+						No
140	Xidamingshan		+					PA	No
141	Xieyang Dao		+					PA	No
142	Xishuangbanna	+	+		+		+	PA	No
143	Yangchun Baiyong			+				PA	No
144	Yinggeling	+		+			+	PA	No
145	Yiwa						+		No
146	Yongde Daxueshan	+	+		+			PA	No
147	Youluoshan						+		No
	THAILAND								
148	Ao Bandon		+						No
149	Ao Pattani		+						No
150	Ao Phang-nga	+					+	PA	No
151	Ban Khlong Marakor Tai		+						No
152	Bang Lang	+	+	+			+	PA	No
153	Bu Do-Sungai Padi		+				+	PA	No
154	Bung Boraphet	+	+					PA	No
155	Bung Khong Lhong		+				+	PA	No
156	Chaloem Pra Kiat (Pa Phru To Daeng)	+	+	+			+	PA	No
157	Chao Phraya River from Nonthaburi to Nakon Sawan					+			No
158	Doi Chiang Dao	+	+	+			+	PA	No
159	Doi Inthanon	+	+	+			+	PA	No
160	Doi Pha Chang	+	+					PA	No
161	Doi Phukha		+				+	PA	No
162	Doi Phu Nang		+				+	PA	No
163	Doi Suthep-Pui	+	+	+	+		+	PA	No
164	Erawan	+					+	PA	No
165	Hala-Bala	+	+	+	+		+	PA	No
166	Hat Chao Mai	+	+				+	PA	No

No.	Key Biodiversity Area	Mammals	Birds	Reptiles	Amphibians	Fish	Plants	Protected Area*	Key Biodiversity Area within a Priority Corridor
167	Hat Nopharat Thara-Mu Ko Phi Phi		+				+	PA	No
168	Huai Kha Khaeng	+	+	+			+	PA	No
169	Huai Nam Dang						+	PA	No
170	Inner Gulf of Thailand		+			+			No
171	Kaeng Krachan	+	+	+			+	PA	No
172	Kaeng Krung	+					+	PA	No
173	Khao Ang Ru Nai	+	+	+				PA	No
174	Khao Banthad	+	+	+	+		+	PA	No
175	Khao Chamao-Khao Wong	+					+	PA	No
176	Khao Chong				+				No
177	Khao Khitchakut	+			+		+	PA	No
178	Khao Laem	+	+				+	PA	No
179	Khao Lak-Lam Ru			+	+		+	PA	No
180	Khao Luang	+	+	+			+	PA	No
181	Khao Nam Khang						+	PA	No
182	Khao Nor Chuchi	+	+	+			+	PA	No
183	Khao Phanom Bencha	+					+	PA	No
184	Khao Pu-Khao Ya	+					+	PA	No
185	Khao Sabab-Namtok Phlew	+		+	+		+	PA	No
186	Khao Sam Roi Yot	+	+				+	PA	No
187	Khao Soi Dao	+	+	+			+	PA	No
188	Khao Sok	+					+	PA	No
189	Khao Yai	+	+				+	PA	No
190	Khlong Lan	+		+			+	PA	No
191	Khlong Nakha	+			+		+	PA	No
192	Khlong Saeng	+		+	+		+	PA	No
193	Ko Li Bong		+				+	PA	No
194	Ko Pra Thong		+						No
195	Kuiburi	+					+	PA	No
196	Laem Pakarang		+						No
197	Lam Khlong Ngu						+	PA	No
198	Lower Central Basin		+						No
199	Lum Nam Pai	+				+		PA	No
200	Mae Fang		+					PA	No
201	Mae Jarim NP		+					PA	No
202	Mae Jarim WS		+					PA	No
203	Mae Klong Basin			+		+			No

No.	Key Biodiversity Area	Mammals	Birds	Reptiles	Amphibians	Fish	Plants	Protected Area*	Key Biodiversity Area within a Priority Corridor
204	Mae Lao-Mae Sae	+	+					PA	No
205	Mae Ping						+	PA	No
206	Mae Tuen	+						PA	No
207	Mae Wong	+	+				+	PA	No
208	Mae Yom	+	+	+			+	PA	No
209	Mekong Channel near Pakchom		+			+			Mekong River and Major Tributaries
210	Mu Ko Chang						+	PA	No
211	Mu Ko Similan		+				+	PA	No
212	Mu Ko Surin		+				+	PA	No
213	Na Muang Krabi		+						No
214	Nam Nao	+	+	+			+	PA	No
215	Nam River					+			No
216	Namtok Huai Yang						+	PA	No
217	Namtok Khlong Kaew						+	PA	No
218	Namtok Sai Khao						+	PA	No
219	Namtok Yong						+	PA	No
220	Nanthaburi		+				+	PA	No
221	Nong Bong Kai		+			+		PA	No
222	Om Koi	+	+					PA	No
223	Palian Lang-ngu		+						No
224	Pang Sida	+		+			+	PA	No
225	Phu Jong Na Yoi			+			+	PA	No
226	Phu Khieo	+	+	+			+	PA	No
227	Phu Kradung	+		+			+	PA	No
228	Phu Luang	+		+			+	PA	No
229	Phu Miang-Phu Thong	+					+	PA	No
230	Phu Phan	+					+	PA	No
231	Prince Chumphon Park	+	+				+	PA	No
232	Sakaerat			+	+		+	PA	No
233	Sai Yok	+		+		+	+	PA	No
234	Salak Phra	+		+				PA	No
235	Salawin	+						PA	No
236	San Kala Khiri						+	PA	No
237	Sanambin		+					PA	No
238	Sri Lanna						+	PA	No
239	Sri Nakarin	+	+				+	PA	No

No.	Key Biodiversity Area	Mammals	Birds	Reptiles	Amphibians	Fish	Plants	Protected Area*	Key Biodiversity Area within a Priority Corridor
240	Sri Nan		+				+	PA	No
241	Sri Phang-nga	+					+	PA	No
242	Sub Langkha	+					+	PA	No
243	Tai Rom Yen	+					+	PA	No
244	Tarutao	+					+	PA	No
245	Tha Yang		+						No
246	Thab Lan	+			+		+	PA	No
247	Thaleban	+	+				+	PA	No
248	Thale Noi		+					PA	No
249	Thale Sab		+				+	PA	No
250	Tham Ba Dan					+			No
251	Thung Kha		+					PA	No
252	Thung Salaeng Luang	+					+	PA	No
253	Thung Tha Laad		+						No
254	Thung Yai-Naresuan	+	+	+			+	PA	No
255	Ton Nga Chang	+		+			+	PA	No
256	Tonpariwat		+					PA	No
257	Trat Wetlands					+			No
258	Umphang	+	+	+				PA	No
259	Wiang Lo		+					PA	No
260	Yot Dom			+				PA	No
	VIETNAM								
261	A Luoi-Nam Dong	+							No
262	A Yun Pa	+	+				+		No
263	An Hai		+						No
264	Ba Be	+			+		+	PA	Northern Highlands Limestone
265	Ba Tri		+						No
266	Bac Lieu		+					PA	No
267	Bach Ma	+	+				+	PA	No
268	Bai Boi		+						No
269	Ban Bung	+	+	+			+		Northern Highlands Limestone
270	Ban Thi-Xuan Lac	+	+	+					Northern Highlands Limestone
271	Bao Loc-Loc Bac	+							No
272	Ben En	+					+	PA	No

No.	Key Biodiversity Area	Mammals	Birds	Reptiles	Amphibians	Fish	Plants	Protected Area*	Key Biodiversity Area within a Priority Corridor
273	Bi Dup-Nui Ba	+	+				+	PA	No
274	Bien Lac-Nui Ong	+						PA	No
275	Bim Son	+							No
276	Binh An	+							Northern Highlands Limestone
277	Binh Dai		+						No
278	Bu Gia Map	+						PA	No
279	Ca Mau		+						No
280	Can Gio		+						No
281	Cat Ba	+					+	PA	No
282	Cat Loc	+	+					PA	No
283	Cham Chu	+							Northern Highlands Limestone
284	Che Tao	+	+				+		No
285	Chu Prong	+	+	+			+		No
286	Chu Yang Sin	+	+				+	PA	No
287	Chua Hang		+						No
288	Chua Huong	+						PA	No
289	Cong Troi	+	+						No
290	Cu Jut	+							No
291	Cuc Phuong	+	+	+			+	PA	No
292	Dak Dam		+						No
293	Dakrong	+	+				+		No
294	Dat Mui		+					PA	No
295	Deo Nui San	+	+						No
296	Dong Phuc				+				Northern Highlands Limestone
297	Du Gia	+	+		+				Northern Highlands Limestone
298	Ea So	+	+						No
299	Fan Si Pan	+	+		+		+	PA	No
300	Ha Nam		+						No
301	Ha Tien		+						No
302	Hoa Lu-Tam Coc-Bich Dong	+							No
303	Huong Son	+							No
304	Ke Bang	+	+				+	PA	No
305	Ke Go	+	+					PA	No
306	Khe Net	+	+				+		No
307	Kien Luong		+						No

No.	Key Biodiversity Area	Mammals	Birds	Reptiles	Amphibians	Fish	Plants	Protected Area*	Key Biodiversity Area within a Priority Corridor
308	Kim Hy	+					+		Northern Highlands Limestone
309	Kon Cha Rang-An Toan	+	+		+		+	PA	No
310	Kon Ka Kinh	+	+	+	+		+	PA	No
311	Kon Plong	+	+	+			+		No
312	Lac Thuy-Kim Bang	+							No
313	Lang Sen		+				+		No
314	Lo Go Sa Mat	+	+					PA	No
315	Lo Xo Pass	+	+				+	PA	No
316	Macooih	+	+						No
317	Mom Ray	+	+					PA	No
318	Na Chi	+			+				Northern Highlands Limestone
319	Nam Cat Tien	+	+	+			+	PA	No
320	Nghia Hung		+						No
321	Ngoc Linh	+	+		+		+	PA	No
322	Ngoc Son	+							No
323	Northern Hien	+	+						No
324	Nui Boi Yao	+							No
325	Nui Chua	+						PA	No
326	Nui Giang Man	+							No
327	Phong Dien	+	+				+		No
328	Phong Nha	+	+				+	PA	No
329	Phu Ninh	+							No
330	Phuoc Binh	+	+				+		No
331	Pu Huong	+					+	PA	No
332	Pu Luong	+					+		No
333	Pu Mat	+	+	+			+	PA	No
334	Que Son	+	+						No
335	Sinh Long	+							Northern Highlands Limestone
336	Song Thanh	+	+				+	PA	No
337	Ta Dung				+				No
338	Tam Dao				+			PA	No
339	Tat Ke	+					+		Northern Highlands Limestone
340	Tay Con Linh		+		+				Northern Highlands Limestone
341	Thai Thuy		+						No

No.	Key Biodiversity Area	Mammals	Birds	Reptiles	Amphibians	Fish	Plants	Protected Area*	Key Biodiversity Area within a Priority Corridor
342	Thanh Hen Lake						+		Northern Highlands Limestone
343	Thiet Ong	+							No
344	Tien Hai		+					PA	No
345	Tien Lang		+						No
346	Tien Phuoc	+							No
347	Tra Co		+						No
348	Tra Cu		+						No
349	Tram Chim		+					PA	No
350	Tram Lap-Dakrong	+							No
351	Trung Khanh	+					+	PA	Northern Highlands Limestone
352	Truong Son	+	+						No
353	Tuyen Lam	+	+						No
354	U Minh Thuong	+	+	+				PA	No
355	Van Ban	+	+	+	+		+		No
356	Van Long	+							No
357	Vinh Cuu	+							No
358	Vu Quang	+	+	+			+	PA	No
359	Xuan Lien	+					+		No
360	Xuan Thuy		+					PA	No
361	Ya Lop	+	+						No
362	Yok Don	+	+	+	+			PA	No

Notes: * = key biodiversity area is wholly or partly included within a gazetted protected area.

Appendix 3. Conservation Corridors in Indochina

No.	Conservation Corridor	Key Biodiversity Areas	Countries	Area (km^2)	Selection Criteria for Priority Corridors				
					Globally Significant Populations of CR and EN Species	Globally Significant Populations of Landscape Species	Unique or Exceptional Ecological & Evolutionary Processes	Urgency for Conservation Action	Opportunity for Additional Investment
1	Bolaven Plateau	Bolaven North-east; Dong Hua Sao	Lao P.D.R.	4,428	*Elephas maximus*	Asian Elephant		Medium	High
2	Cambodia-Lao P.D.R.-Vietnam Tri-border Forests	Dong Ampham; Mom Ray; Nam Ghong; Virachey	Cambodia, Lao P.D.R. and Vietnam	11,278	*Elephas maximus; Pygathrix nemaeus; Pygathrix nigripes*	Asian Elephant		Medium	Medium
3	Cardamom and Elephant Mountains	Central Cardamoms; Kirirom; Phnom Aural; Phnom Bokor; Phnom Samkos	Cambodia	14,380	*Arborophila cambodiana; Crocodylus siamensis; Elephas maximus; Scleropages formosus*	Asian Elephant		High	Medium
4	Central Annamites	A Luoi-Nam Dong; Bach Ma; Dakrong; Kon Cha Rang-An Toan; Kon Ka Kinh; Kon Plong; Lo Xo Pass; Macooih; Ngoc Linh; Northern Hien; Phong Dien; Phou Ahyon; Phu Ninh; Que Son; Song Thanh; Tien Phuoc; Tram Lap-Dakrong; Xe Sap	Lao P.D.R. and Vietnam	32,951	*Lophura edwardsi; Pseudoryx nghetinhensis; Pygathrix nemaeus*		altitudinal migration	High	Medium
5	Central Indochina Limestone	Hin Namno; Ke Bang; Khammouane; Phong Nha	Lao P.D.R. and Vietnam	8,017	*Pygathrix nemaeus*			Medium	Medium
6	Chumphon	Namtok Huai Yang; Prince Chumphon Park	Thailand	1,777			migration of raptors	Medium	High
7	Damingshan Range	Baixu-Qinpai; Damingshan; Xianhu Reservoir	S. China	4,710	*Gorsachius magnificus*			High	Medium
8	Di Linh	Bien Lac-Nui Ong; Deo Nui San	Vietnam	5,188	*Pygathrix nigripes*			Medium	High
9	Doi Phuka-Mae Yom	Doi Pha Chang; Doi Phukha; Doi Phu Nang; Mae Jarim NP; Mae Jarim WS; Mae Yom; Nam Phoun; Nanthaburi; Sri Nan; Wiang Lo	Lao P.D.R. and Thailand	17,105	*Elephas maximus*	Asian Elephant		Medium	High

No.	Conservation Corridor	Key Biodiversity Areas	Countries	Area (km^2)	Selection Criteria for Priority Corridors				
					Globally Significant Populations of CR and EN Species	Globally Significant Populations of Landscape Species	Unique or Exceptional Ecological & Evolutionary Processes	Urgency for Conservation Action	Opportunity for Additional Investment
10	Eastern Plains Dry Forests	Chu Prong; Cu Jut; Dak Dam; Lomphat; Mondulkiri-Kratie Lowlands; Upper Srepok Catchment; Yok Don; Ya Lop	Cambodia and Vietnam	19,905	*Bos javanicus; Bubalus bubalis; Crocodylus siamensis; Elephas maximus; Gyps bengalensis; Gyps tenuirostris; Hieremys annandalii; Indotestudo elongata; Thaumatibis gigantea*	Asian Elephant; vultures; large waterbirds	extreme seasonality, fire regime and other processes characteristic of dry forests	High	Medium
11	Hainan Mountains	Bawangling; Datian; Diaoluoshan; Fanjia; Ganshiling; Houmiling; Jianfengling; Jianling; Jiaxi; Liji; Limushan; Lotung; Nanmaoling; Sanya; Shangxi; Tongtieling; Wanling; Wuzhishan; Yinggeling	S. China	16,780	*Amolops hainanensis; Buergeria oxycephala; Cuora galbinifrons; Hylomys hainanensis; Mauremys mutica; Nomascus concolor; Platysternon megacephalum; Sacalia quadriocellata; Tylototriton hainanensis*			High	High
12	Hala-Bala	Bang Lang; Bu Do-Sungai Padi; Chaloem Pra Kiat (Pa Phru To Daeng); Hala-Bala; Khao Nam Khang; Namtok Sai Khao; San Kala Khiri	Thailand	7,387	*Cynogale bennettii; Dicerorhinus sumatrensis; Heosemys spinosa; Panthera tigris; Pelochelys cantorii; Tapirus indicus*	Plain-pouched Hornbill, Rhinoceros Hornbill	near-intact lowland evergreen forest ecosystem	High	High
13	Hong Kong-Shenzhen Mountains	Hong Kong Island and Associated Islands; Inland New Territories; Lantau Island and Associated Islands	S. China	1,332	*Chinemys reevesii; Cuora trifasciata; Sacalia bealei; Xenophrys brachykolos*			Medium	Low
14	Huanglianshan/ Hoang Lien Mountains	Che Tao; Daweishan; Fan Si Pan; Fenshuiling; Huanglianshan; Van Ban	S. China and Vietnam	20,215	*Chaparana unculuanus; Nomascus concolor; Paa boulengeri; Paa yunnanensis; Vibrissaphora echinata*		altitudinal migration	High	High
15	Inner Gulf of Thailand	Inner Gulf of Thailand, Khao Sam Roi Yot	Thailand	1,413	*Pristis microdon; Tringa guttifer*		migration of shorebirds	High	High

No.	Conservation Corridor	Key Biodiversity Areas	Countries	Area (km^2)	Selection Criteria for Priority Corridors				
					Globally Significant Populations of CR and EN Species	Globally Significant Populations of Landscape Species	Unique or Exceptional Ecological & Evolutionary Processes	Urgency for Conservation Action	Opportunity for Additional Investment
16	Kaeng Krachan	Kaeng Krachan; Kuiburi	Thailand	5,488	*Crocodylus siamensis; Elephas maximus; Panthera tigris; Tapirus indicus*	Asian Elephant; Great Hornbill; Plain-pouched Hornbill		High	High
17	Ke Go and Khe Net Lowlands	Ke Go; Khe Net	Vietnam	1,014	*Lophura hatinhensis*			Medium	High
18	Khao Banthad	Khao Banthad; Khao Pu-Khao Ya; Thaleban; Ton Nga Chang	Thailand	4,088	*Manouria emys*			Medium	High
19	Khao Luang	Khao Luang; Namtok Yong; Tai Rom Yen	Thailand	2,449		Great Hornbill		Medium	High
20	Khlong Saeng-Khao Sok	Kaeng Krung; Khao Lak-Lam Ru; Khao Sok; Khlong Nakha; Khlong Saeng; Ko Pra Thong; Sri Phang-nga; Tonpariwat	Thailand	8,165				Medium	Medium
21	Lower Eastern Forest Complex	Khao Ang Ru Nai; Khao Chamao-Khao Wong; Khao Khitchakut; Khao Sabab-Namtok Phlew; Khao Soi Dao	Thailand	4,155	*Arborophila cambodiana; Elephas maximus*	Asian Elephant		Medium	High
22	Lowland Dong Nai Watershed	Bao Loc-Loc Bac; Cat Loc; Nam Cat Tien; Ta Dung; Vinh Cuu	Vietnam	8,328	*Arborophila davidi; Pygathrix nigripes; Rhinoceros sondaicus*	Great Hornbill		Medium	Medium
23	Lum Nam Pai-Salawin	Doi Chiang Dao; Doi Inthanon; Doi Suthep-Pui; Huai Nam Dang; Lum Nam Pai; Mae Lao-Mae Sae; Salawin	Thailand	24,402	*Platysternon megacephalum*			Medium	High
24	Mae Ping-Om Koi	Mae Ping; Mae Tuen; Om Koi	Thailand	8,716				Medium	High
25	Mekong Delta Coastal Zone	Ba Tri; Bac Lieu; Bai Boi; Binh Dai; Can Gio; Chua Hang; Dat Mui; Tra Cu	Vietnam	3,950	*Tringa guttifer*		migration of shorebirds	High	Medium

No.	Conservation Corridor	Key Biodiversity Areas	Countries	Area (km^2)	Selection Criteria for Priority Corridors				
					Globally Significant Populations of CR and EN Species	Globally Significant Populations of Landscape Species	Unique or Exceptional Ecological & Evolutionary Processes	Urgency for Conservation Action	Opportunity for Additional Investment
26	Mekong River and Major Tributaries	Basset Marsh; Boeung Veal Samnap; Mekong from Kratie to Lao P.D.R.; Mekong Channel near Pakchom; Mekong from Phou Xiang Thong to Siphandon; Mekong upstream of Vientiane; Sekong River; Sesan River; Siphandon; Upper Lao Mekong; Upper Xe Khaman	Cambodia, Lao P.D.R. and Thailand	17,070	*Chela caeruleostigmata; Crocodylus siamensis; Dasyatis laosensis; Himantura signifer; Pangasianodon gigas; Pelochelys cantorii; Pristis microdon; Probarbus jullieni; Tenualosa thibaudeaui*	Irrawaddy Dolphin; migratory freshwater fish; sandbar-nesting birds	migration of fish species	High	High
27	Mu Ko Similan-Phi Phi-Andaman	Ao Phang-nga; Hat Chao Mai; Hat Nopharat Thara-Mu Ko Phi Phi; Khao Nor Chuchi; Khao Phanom Bencha; Ko Li Bong; Laem Pakarang; Mu Ko Similan; Na Muang Krabi; Palian Lang-ngu; Tarutao	Thailand	26,430	*Fregata andrewsi; Heosemys spinosa; Pitta gurneyi; Tringa guttifer*		migration of shorebirds	Medium	High
28	Nam Et-Phou Louey	Nam Et; Phou Louey	Lao P.D.R.	4,411	*Panthera tigris*			Medium	High
29	North-western Mekong Delta Wetlands	Bassac Marsh; Boeung Prek Lapouv; Ha Tien; Kampong Trach; Kien Luong; Lang Sen; Tram Chim	Cambodia and Vietnam	7,865		large waterbirds	seasonal flood regime; migration of large waterbirds	High	Medium
30	Northern Annamites	Huong Son; Nakai-Nam Theun; Nakai Plateau; Nam Chat-Nam Pan; Nui Giang Man; Pu Mat; Vu Quang	Lao P.D.R. and Vietnam	21,220	*Cuora galbinifrons; Cuora trifasciata; Elephas maximus; Panthera tigris; Platysternon megacephalum; Pseudoryx nghetinhensis; Pygathrix nemaeus; Sacalia quadriocellata*	Asian Elephant; Rufous-necked Hornbill		High	Medium

No.	Conservation Corridor	Key Biodiversity Areas	Countries	Area (km^2)	Selection Criteria for Priority Corridors				
					Globally Significant Populations of CR and EN Species	Globally Significant Populations of Landscape Species	Unique or Exceptional Ecological & Evolutionary Processes	Urgency for Conservation Action	Opportunity for Additional Investment
31	Northern Highlands Limestone	Ba Be; Ban Bung; Ban Thi-Xuan Lac; Binh An; Cham Chu; Diding; Dong Phuc; Du Gia; Gulongshan; Kim Hy; Na Chi; Nongxin; Sinh Long; Tat Ke; Tay Con Linh; Thanh Hen Lake; Trung Khanh	S. China and Vietnam	24,477	*Gorsachius magnificus; Nomascus concolor; Paa boulengeri; Rhinopithecus avunculus; Xenophrys brachykolos*			High	High
32	Northern Indochina Limestone	Bim Son; Chua Huong; Cuc Phuong; Hoa Lu-Tam Coc-Bich Dong; Lac Thuy-Kim Bang; Ngoc Son; Nui Boi Yao; Pu Luong; Thiet Ong; Van Long	Vietnam	6,757	*Trachypithecus delacouri*			Medium	Medium
33	Northern Plains Dry Forests	Chhep; Dong Khanthung; O Skach; Upper Stung Sen Catchment	Cambodia and Lao P.D.R.	19,460	*Cairina scutulata; Gyps bengalensis; Gyps tenuirostris; Hieremys annandalii; Indotestudo elongata; Thaumatibis gigantea*	vultures; large waterbirds	extreme seasonality, fire regime and other processes characteristic of dry forests	High	Medium
34	Phanom Dongrak-Pha Tam	Phu Jong Na Yoi; Yot Dom	Thailand	3,537				High	Medium
35	Phu Khieo-Nam Nao	Nam Nao; Phu Khieo; Phu Kradung; Phu Luang; Sub Langkha	Thailand	13,430	*Cairina scutulata; Elephas maximus; Panthera tigris; Platysternon megacephalum*	Asian Elephant		High	Low
36	Phu Miang-Phu Thong	Phu Miang-Phu Thong; Thung Salaeng Luang	Thailand	9,968				Medium	High
37	Quang Binh-Quang Tri-Xe Bangfai Lowlands	Truong Son; Upper Xe Bangfai	Lao P.D.R. and Vietnam	3,823	*Pseudoryx nghetinhensis*			High	Medium

No.	Conservation Corridor	Key Biodiversity Areas	Countries	Area (km^2)	Selection Criteria for Priority Corridors				
					Globally Significant Populations of CR and EN Species	Globally Significant Populations of Landscape Species	Unique or Exceptional Ecological & Evolutionary Processes	Urgency for Conservation Action	Opportunity for Additional Investment
38	Red River Delta Coastal Zone	An Hai; Ha Nam; Nghia Hung; Thai Thuy; Tien Hai; Tien Lang; Xuan Thuy	Vietnam	2,262	*Platalea minor; Tringa guttifer*	Black-faced Spoonbill	migration of shorebirds	High	Medium
39	Sekong Plains	Western Siem Pang	Cambodia	3,873	*Gyps bengalensis; Gyps tenuirostris; Pseudibis davisoni; Thaumatibis gigantea*	vultures; large waterbirds		High	Medium
40	Shiwandashan Range	Fangchen Shanue; Shiwandashan	S. China	2,464	*Sacalia quadriocellata*			Medium	High
41	South China Shorebird Flyway	Dongzhaigang; Fangcheng; Futian; Leizhou Peninsula; Mai Po and Inner Deep Bay; Nangliujiang Hekou; Shankou; Taipa-Coloane	S. China	23,720	*Platalea minor; Tringa guttifer*	Black-faced Spoonbill	migration of shorebirds	High	Medium
42	Southern Annamites Main Montane Block	Bi Dup-Nui Ba; Chu Yang Sin; Cong Troi; Phuoc Binh; Tuyen Lam	Vietnam	10,220	*Crocias langbianis; Garrulax yersini*		altitudinal migration	Medium	Medium
43	Southern Annamites Western Slopes	Bu Gia Map; Snoul-Keo Sema-O Reang	Cambodia and Vietnam	3,932	*Arborophila davidi; Pygathrix nigripes*			High	Medium
44	Sri Lanna-Khun Tan	Sri Lanna	Thailand	20,227				Medium	High
45	Tongbiguan-Dehong Zizhizhou	Dehong Zizhizhou; Tongbiguan	S. China	1,244	*Ailurus fulgens; Bunipithecus hoolock; Elephas maximus*	Asian Elephant; Rufous-necked Hornbill		High	Medium
46	Tonle Sap Lake and Inundation Zone	Ang Tropeang Thmor; Boeung Chhmar-Moat Khla; Chhnuk Tru; Dei Roneat; Lower Stung Sen; Preah Net Preah-Kra Lanh-Pourk; Prek Toal; Stung-Chi Kreng-Kampong Svay; Stung Sen-Santuk-Baray; Veal Srongae	Cambodia	17,614	*Houbaropsis bengalensis; Leptoptilos dubius*	migratory freshwater fish; large waterbirds	seasonal flood regime; migration of large waterbird and fish species	High	Medium
47	Upper Chu River Watershed	Pu Huong; Xuan Lien	Vietnam	4,497				Medium	High

No.	Conservation Corridor	Key Biodiversity Areas	Countries	Area (km^2)	Selection Criteria for Priority Corridors				
					Globally Significant Populations of CR and EN Species	Globally Significant Populations of Landscape Species	Unique or Exceptional Ecological & Evolutionary Processes	Urgency for Conservation Action	Opportunity for Additional Investment
48	Upper Eastern Forest Complex	Khao Yai; Pang Sida; Sakaerat; Thab Lan	Thailand	9,730	*Elephas maximus; Indotestudo elongata; Panthera tigris*	Asian Elephant; Great Hornbill		High	Medium
49	Western Forest Complex	Erawan; Huai Kha Khaeng; Khao Laem; Khlong Lan; Lam Khlong Ngu; Mae Wong; Sai Yok; Salak Phra; Sri Nakarin; Tham Ba Dan; Thung Yai-Naresuan; Umphang	Thailand	24,256	*Bos javanicus; Bubalus bubalis; Cairina scutulata; Craseonycteris thonglongyai; Elephas maximus; Indotestudo elongata; Leopoldamys neilli; Manouria emys; Manouria impressa; Panthera tigris; Tapirus indicus*	Asian Elephant; Plain-pouched Hornbill; Rufous-necked Hornbill		Medium	Low
50	Xe Khampho-Xe Pian	Nong Khe Wetlands; Xe Khampho; Xe Pian	Lao P.D.R.	4,786	*Cairina scutulata; Crocodylus siamensis; Elephas maximus*	Asian Elephant; Great Hornbill		High	Medium
51	Xishuangbanna-Simao	Babianjiang; Caiyanghe; Xishuangbanna; Yiwa; Youluoshan	S. China	8,562	*Elephas maximus; Leptolalax ventripunctatus; Palea steindachneri; Panthera tigris; Platysternon megacephalum*	Asian Elephant		High	Medium
52	Yunwushan Range	Dawuling; Heweishan; Qixingkeng; Yangchun Baiyong	S. China	3,851				High	Medium
53	Zuojiang Valley	Chongzuo; Fusui-Bapen; Fusui-Nahuang; Nonggang; Paiyangshan; Shangsi-Biannian	S. China	1,740	*Gorsachius magnificus; Trachypithecus poliocephalus*			High	High

Appendix 4. Provisional Priority Species for CEPF Investment in Indochina*

Priority Species	Conservation Need(s) Requiring Species-focused Action	Over-Riding Need for Greatly Improved Information
MAMMALS		
Sun Bear *Helarctos malayanus*	Control of overexploitation	
Hairy-nosed Otter *Lutra sumatrana*	Control of overexploitation	
Sunda Pangolin *Manis javanica*	Control of overexploitation	
Chinese Pangolin *Manis pentadactyla*	Control of overexploitation	
White-cheeked Crested Gibbon *Nomascus leucogenys*	Control of overexploitation	
Irrawaddy Dolphin *Orcaella brevirostris*	Control of incompatible fishing techniques	
BIRDS		
Black-bellied Tern *Sterna acuticauda*	Active population management	
REPTILES		
Chinese Crocodile Lizard *Shinisaurus crocodilurus*	Control of overexploitation	
FISH		
Smallscale Croaker *Boesemania microlepis*	Control of overexploitation	
Giant Barb *Catlocarpio siamensis*	Control of overexploitation	
Tigerfish *Coius* spp. and *Datnioides* spp.	Control of overexploitation	
Pla Thepa *Pangasius sanitwongsei*	Control of overexploitation	
Thicklip Barb *Probarbus labeamajor*	Control of overexploitation	

* These species could become eligible for CEPF investment if their global threat status is reassessed as globally threatened during the 5-year investment period.

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