

U.S. Fish & Wildlife Service

# Asian Elephant Conservation Act

*Summary Report*  
*1999-2001*



*The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people.*

**Cover:**

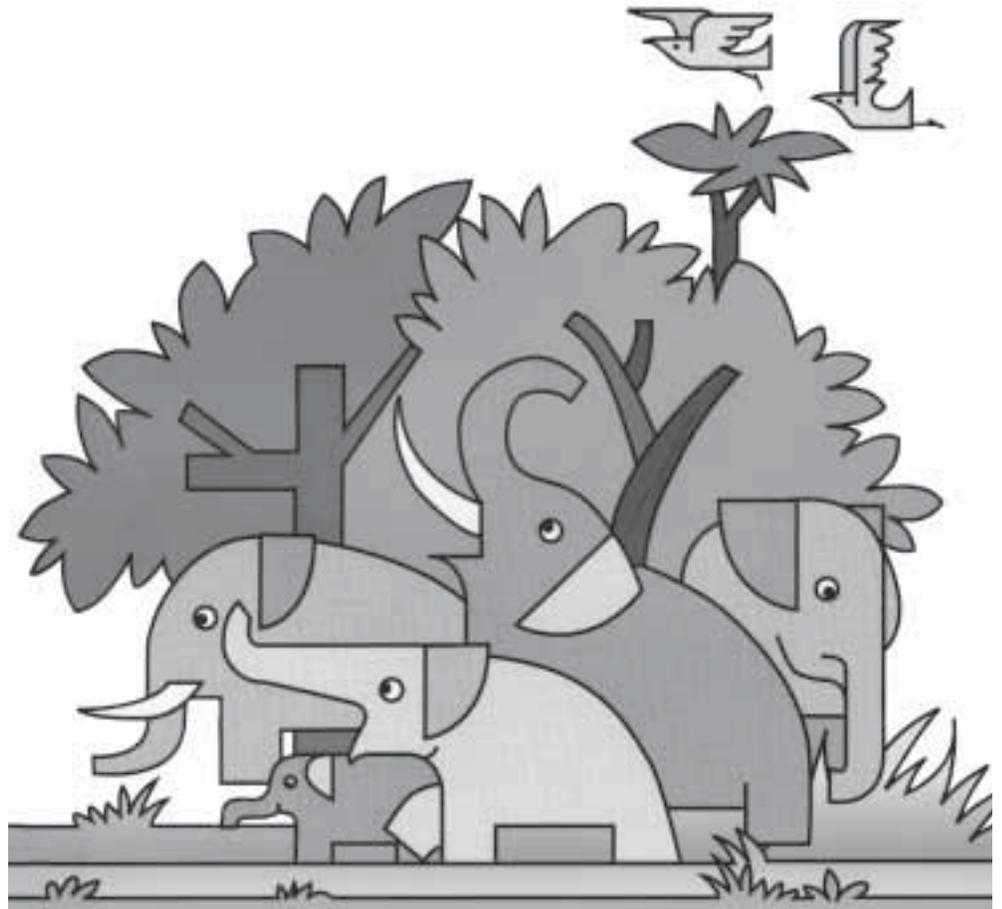
*A subadult male Asian elephant in the fertile grasslands of the Brahmaputra River floodplains, Kaziranga National Park, Assam, India. The forested hills in the background are an essential wet season component of this habitat which is part of India's Kaziranga-Karbelong-Intanki Elephant Reserve, home to 1,500 to 2,000 elephants.*

Karl Stromayer

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*A cover drawing from the children's book "Elephantasy," a publication under the project titled School Education to support Asian Elephant Conservation. See page 23.*

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# Introduction

The Asian elephant (*Elephas maximus*) is a keystone species, sharing a land mass with some of the most densely populated and poorest areas in the world. The pressure brought on by these conditions has resulted in the conversion of forest cover to agriculture and villages, fragmenting elephant habitat and populations. While the Asian elephant is the well-known elephant of circuses and elephant rides, the African elephant's plight in the wild has been more successfully popularized by the western media. Relatively few people are aware that the Asian elephant is critically endangered in the wild.

Several distinctive anatomical characteristics differentiate the Asian elephant from the larger, more abundant African elephant (*Loxodonta africana*). For example, the ears of Asian elephants are smaller; the forehead has two distinct lobes, rather than the single dome of the African elephant; and, the highest point on an Asian elephant is the top of the head, versus the top of the shoulder in the African elephant. In addition, only 60 percent of male Asian elephants have tusks, while tusked males and females are the rule in the African species. Due to poaching, which selects against tusk-bearing males, many localities throughout Asia have depleted numbers of mature elephant bulls, resulting in an abnormal population-age structure and sex ratio. The long-term impacts of this factor on the conservation of the Asian elephant is unknown.

This report presents a summary and highlights of the work supported by the Asian Elephant Conservation Fund (Fund) during 1999-2001. The Fund is administered and coordinated by the Division of International Conservation, U.S. Fish and Wildlife Service (Service), Department of the Interior:

*An Asian elephant in Sri Lanka's Yala National Park and Biosphere Reserve. The island nation of Sri Lanka is home to some 3,000 Asian elephants.*

USFWS/Fred Bagley

*Within the context of conservation planning to conserve maximum biodiversity and ecosystem function, the importance of conserving the Asian elephant across as much of its range as possible cannot be overemphasized. There are also profound ideological and religious reasons to preserve this species and halt its decline.*

*If wild populations of Asian elephants are to survive into the 22<sup>nd</sup> Century, habitat, such as this in India's Nilgiris and Eastern Ghats Elephant Reserve must be protected. Conversion to farmland is a primary threat. For example, clear-cutting and an expanding agricultural frontier have already displaced Asian elephants from much of Yunnan Province, China (top and center) and Indonesia's Lampung Province (bottom).*



Yunnan Provincial Forestry Department



Photographs Karl Stromayer

# Background

Asian elephants once roamed most of the forest and savannah regions of Asia. Today only about 35,000-40,000 hold on precariously in the wild places of 13 nations (Bangladesh, Bhutan, Burma, Cambodia, China, India, Indonesia, Laos, Malaysia, Nepal, Sri Lanka, Thailand, and Vietnam). Additionally, an estimated 16,000 domesticated elephants, mostly wild-caught, assist humans in 11 of the same nations. Throughout their range, there may be fewer than 10 separate populations of wild Asian elephants with more than 1,000 animals; half of these are found in India. Mature bulls reach more than 11,000 pounds (5,000 kilograms), require upwards of 440 pounds (200 kilograms) of vegetation and 52 gallons (200 liters) of water per day, and inhabit home ranges of more than 80 square miles (200 km<sup>2</sup>). These facts alone demonstrate the significant demands Asian elephants put on local resources.

The Asian elephant lives in a wide variety of habitats, including savanna, scrub forest, secondary forest, and closed-canopy forest. Grasses typically account for more than 50 percent of the Asian elephant's diet; grassland forest-mosaics are considered optimal habitat. In such areas, concentrations as high as five elephants per 0.38 square mile (1 km<sup>2</sup>) have been recorded. The Asian elephant is characterized by longevity, slow reproduction, high mobility, and an important but imperfectly understood role in ecosystem-level processes, such as seed dispersal, plant succession, and biogeochemical cycling. At the beginning of the 21st century, the survival of elephants in the wild and in domesticity throughout much of their historic range is severely threatened by a handful of well-understood threats.

During the 20th century, throughout much of South and Southeast Asia, rapidly growing human populations converted forests and grasslands to agriculture, pastures, and villages, fragmenting elephant habitat and elephant populations. In addition, poaching for ivory and other body parts; killing of elephants in conflict with people over crops; and catching elephants for domestication have also contributed to this drastic decline. The

exact magnitude and rate of loss of the world's Asian elephant populations will never be known precisely. Many populations of Asian elephants occupy dense forested habitat and/or are highly mobile, making them difficult to count and monitor. Recently, rigorous, science-based methods have been developed to assess elephant numbers and, indeed, these techniques are still being refined. Still, what is known about the rate of decline of the Asian elephant and its habitat is cause for considerable concern.

Habitat loss is the single greatest threat to the survival of substantial numbers of wild Asian elephants. Recent research at the Smithsonian Institution's Conservation and Research Center suggests that the Asian elephants' geographic range has declined by as much as 70 percent since the 1960's. In Sumatra, Indonesia, believed to support 3,000 Asian elephants, and Assam, India, where 5,000 elephants reside, unsustainable logging, expanding agricultural frontier, economic recession, civil unrest, and human immigration from more populous areas cause widespread habitat loss. These activities result in greater elephant-human conflict, increasing elephant deaths by poisoning, shooting, and electrocution; and, capture and detainment of problem elephants in state-managed facilities. Statistics from Sumatra and Assam corroborate habitat loss as the foremost threat to elephant conservation. During 1985-1997, forest cover declined by 44 percent in Sumatra's Lampung Province; and, between 1990-2000, an estimated 27-39 square miles (70-100 km<sup>2</sup>) of forest were lost annually in Assam.

While habitat loss may be the ultimate cause of the decline of Asian elephant numbers in the wild today, elephant-human conflict over agricultural or commercial plantations of rice, cassava, banana, oil palm, rubber, tea, coffee and other crops is widely held as the leading proximate cause of human-induced elephant deaths over much of the species' range. The root cause of the conflict can be found in the considerable forage requirements of elephants and the high densities of rural, subsistence-based farmers, sometimes up



*Local people in Mymensing Forest Division, Bangladesh rush to chase foraging elephants from their crop fields.*  
IUCN Bangladesh

to 650 people per square mile (250 people per square kilometer), inhabiting elephant range. The conflict is concentrated to periods before harvest or during seasonal movements of elephant groups, often resulting in deaths of elephants and humans alike. In areas of high conflict, people are frequently killed while driving elephants out of agricultural fields or simply by crossing paths with an elephant on its way to or from a crop-raiding site. During 2001, 31 elephants in Assam were poisoned to death during a 70-day period as retribution for crop raiding. In Sri Lanka, a country with approximately 3,000 elephants, 110 -120 elephants are killed each year, most, while crop raiding. If this rate of decline continues, all but a few token populations of wild elephants may go extinct in Sri Lanka during this century.

The destruction of Asian elephant populations by unsustainable hunting has occurred historically and continues to be a major threat in the long term. Poaching, including the killing of elephants for ivory or other body parts such as meat, skin, teeth, feet, and bones, is the primary cause for the decline of the species in some parts of its range. Cambodia has plentiful, available elephant range of at least 8,000 square miles (20,720 km<sup>2</sup>). But after 30 years of warfare and civil unrest, most elephant range in Cambodia can be characterized as defaunated forest (forests intact from a botanical perspective but having reduced elephant and other large vertebrate populations). In some parts of southern India, centuries of targeting male elephants for ivory poaching has produced an extremely skewed adult sex ratio of up to 50 adult female elephants to every adult male “tusker.” This threat is only partially alleviated by the polygamous nature of elephants and the huge territories they occupy. In publicizing this threat, the Wildlife Trust of India characterized poaching of the Asian elephant in India as having been at “very high levels” during 1988-1998.

There remains a strong case for using domesticated elephants as a tool to promote the conservation of wild populations. Approximately 16,000 domesticated elephants are the modern day expression of a more than 4,000 year old form of animal husbandry. The “domestication” of the Asian elephant differs from the domestication of most mammals because elephants have never been selectively bred, and therefore, remain genetically and behaviorally, wild.

It has been estimated that 2-4 million elephants have been captured from the wild during the history of elephant domestication, with 100,000 captured in the 19th century. Because elephant calves are slow to mature and because carrying a fetus may reduce the ability of a female elephant to work, elephant-keeping cultures typically have relied on capture from the wild (rather than captive breeding) as a means of maintaining or increasing their stocks. Given that most captive herds of Asian elephant have been denied the opportunity to optimally and freely breed, the capture and domestication of elephants has often meant a siphoning off of the wild population, leading some conservationists to characterize domestication as a “demographic black hole.” The decrease in local and regional demand for elephants as “beasts of burden” and the lack of appropriate work for the world population of domesticated elephants likely means that capture and domestication are not serious threats to the survival of this species. However, capture does remain a threat in specific local areas and to already heavily impacted populations of Asian elephants.

Serious concerns about the rapid decline of wild Asian elephants led the United States to list the species under the Endangered Species Act as endangered in 1973; and, subsequently in 1976, the member nations to the Convention on the International Trade in Endangered Species (CITES) listed the Asian elephant as an Appendix I species—a status that allows no commercial trade. In addition, formal adoption of the Asian Elephant Conservation Act (AsECA) by the United States government was initiated when a bill was introduced in the House of Representatives on June 4, 1997. Passed by the House on October 21; and by the Senate on November 8, the bill was signed into law by the President on November 19, 1997.

The AsECA was enacted “to assist in the conservation of Asian elephants by supporting and providing financial resources for the conservation programs of nations within the range of Asian elephants and funding projects of persons with demonstrated expertise in the conservation of Asian elephants.” Passage of the AsECA demonstrates that the United States is taking a leadership role in promoting the conservation of the Asian elephant for present and future generations.

*Elephant-human conflict over crops presents a grave threat to conservation of the Asian elephant throughout much of its range. Human and elephant deaths are an increasingly common outcome of this conflict.*



# The Asian Elephant Conservation Fund

The AsECA established the Asian Elephant Conservation Fund (Fund) to provide financial assistance to protect and conserve the Asian elephant. Originally authorized for 5 years between 1997-2002; the AsECA has been reauthorized for an additional 5 years beginning in 2003. Congress appropriated \$1,944,500 to the Fund during 1999-2001. During this period, the Fund has supported 44 projects in 12 range countries, leveraging an almost equal amount from partner organizations in matching and in-kind support.

Priority areas for support from the Fund closely mirror the threats to the Asian elephant. A proposal must show real promise of allowing Asian elephant populations to expand or persist in native habitat for the long term, and must build or meaningfully enhance the capacity of range state citizens to manage elephants and other wildlife resources in the future. Additional criteria include evidence of local government support; matching funds or in-kind contributions from partner organizations; and, potential to result in positive impacts beyond the life of the project. The Fund awards grants to range state governments, non-governmental organizations, and individuals with demonstrated expertise in the conservation of the Asian elephant. Projects can be

classified in the following broad categories: efforts to decrease elephant-human conflict; protection of at-risk elephant populations; protected area/reserve management in important elephant range; habitat/ecosystem conservation and management; surveys and monitoring; applied research; conservation education; cross-border elephant issues; and development and execution of elephant conservation action plans. Captive breeding proposals, other than for release in the wild are not eligible.

The maintenance of protected area networks within larger elephant-friendly landscapes or “managed elephant ranges” likely offer the best long-term hope for conservation of large naturally sustaining elephant populations. Sustaining the Asian elephant in fragmented habitat will require intensive metapopulation management, techniques such as translocation, immunocontraception, habitat management, and the development of a large toolbox of elephant-human conflict mitigation measures. To help ensure Asian elephant populations are conserved under both scenarios, the Fund continues to support well planned efforts to integrate protection, education, research, and management actions to create the circumstances under which the Asian elephant will persist in the wild.

*An Asian elephant at Bandipur National Park, Karnataka, India. Bandipur is the home of 300-350 Asian elephants and forms an integral part of the Nilgiris and Eastern Ghats Elephant Reserve, which has the single largest remaining wild population of Asian elephants (roughly 5,000-6,000 individuals).*

Karl Stromayer





*A biologist with the Asian Elephant Research and Conservation Centre inspects an electric fence that surrounds an agricultural settlement within the Wayanad Wildlife Sanctuary, Kerala, India.*

Karl Stromayer

# On-the-Ground Results

## *Elephant-Human Conflict*

Due to the severity of elephant-human conflicts and their deleterious impacts on elephant conservation, the Fund supports research, development, and implementation of a broad spectrum of efforts aimed at fostering the coexistence of elephants and humans. These efforts include the use of fences, ditches, deterrents, scaring techniques, early warning systems, and the development and fine tuning of new techniques such as chemical repellants, pheromones, strobe lights, and infrasound. The Fund has favored an adaptive management approach to elephant-human conflict mitigation in areas of intense conflict, and assessment of elephant-human conflict in areas where the nature and extent of conflict are less severe.

### **Development, Testing, and Implementation of Elephant-Human Conflict Mitigation Measures in Sri Lanka**

In Sri Lanka, elephant-human conflict resulted in the deaths of more than 100 elephants and 60 people per year during the 1990's. The Fund is supporting three projects that directly address this pressing conservation issue. In partnership with the Sri Lankan Wildlife Conservation Society and the Sri Lankan Department of Wildlife Conservation, and in consortium with the Disney Wildlife Fund and the Wildlife Trust, the Fund is providing support to implement a community-based project that seeks to fence villagers and their crops in and keep the elephants out. This model was originally pioneered in Zimbabwe by the Communal Areas Management Program For Indigenous Resources (CAMPFIRE), when it was realized that carving up vast landscapes with linear fences was contrary to the goals of crop protection and wildlife management. In the Sri Lankan context, early attempts to use electric fencing to mitigate elephant-human conflict were not successful—perhaps because long linear stretches of fence were built without reliable mechanisms to ensure fence maintenance and integrity. Under the current model of fencing villages in and elephants out, circular solar-powered fences of 5-6 miles (8-10 km) in length are

being built around villages and surrounding crop fields, but only after agreements have been reached with local communities to ensure routine maintenance. In addition, records of crop yields, revenue, and losses to wildlife depredation are maintained so long-term costs and benefits can be determined.

In a companion project, a group of engineers affiliated with Motorola, and supported by the Fund and the Sri Lankan Department of Wildlife Conservation, are working to develop and apply new techniques to detect elephant movements towards crop fields and deter their intrusions. Thus far, seismic detectors, a simple trip wire system attached to a buzzer, and infrasound techniques have been examined as potential “early warning signals” to alert farmers of approaching elephants and that crop depredation may be imminent. The trip wire system shows great promise. Farmers who previously spent months camping in the fields night-after-night are now able to stay at home. Farmers come out to the field when wires are tripped by approaching elephants. The trip wire system is being replicated at different sites, and further efforts to adapt this system to the diverse conditions of the Sri Lankan elephant range are being investigated.

A third, and equally innovative strategy aimed at enhancing human tolerance for elephants is being undertaken outside of Sri Lanka's Yala National Park. Since 70 percent of Sri Lanka's approximately 3,000 wild Asian elephants live outside parks, development of ecotourism opportunities based on elephant viewing might provide an alternate source of income to farmers and increase tolerance to crop raiding. In the first pilot project of this type in Sri Lanka, the Wildlife Trust is partnering with local communities to build simple camps and wildlife viewing blinds in trees. It is hoped that the revenue generated from this industry will help offset the economic damage wrought by crop-raiding elephants and help win support for conservation.

*Elephants, being highly intelligent animals, are able to overcome many attempts to reduce their damaging impacts on crop fields. Therefore, it is often useful to apply elephant-human conflict mitigation measures in dynamic and multiple applications.*



# *Protection of At-Risk Elephant Populations*

Asian elephant ivory is highly favored by many ivory traders, and elephant bones and body parts used in the Asian medicinal trade are commodities much in demand by the global marketplace. Acknowledging that uncontrolled trade in elephant ivory and body parts is a serious threat to the survival of the species, the Fund supports the equipping and training of uniformed state-sponsored anti-poaching forces; the prevention and investigation into the illegal trade in ivory; and, the building and maintenance of park infrastructure such as roads, anti-poaching camps, and watchtowers.

## **Protecting the Asian Elephant in Cambodia's Cardamom Mountains**

Half (up to 300) of Cambodia's elephants are believed to inhabit the Cardamom Mountains in southwest Cambodia. During the past three decades, this remote area was void of intense organized poaching prevalent in Cambodia by virtue of having been a Khmer Rouge stronghold. A series of national-level elephant and wildlife surveys, supported by the Fund, revealed that the Cardamoms were a key elephant landscape. Nevertheless, 26 elephants were poached there during a 16-month period. The Cambodian Ministry of Agriculture, Forestry and Fisheries, with support from the Fund and in cooperation with Conservation International, Cat Action Treasury and the University of Minnesota, developed a protection and monitoring plan for this key Indochinese elephant range. In the Central Cardamom Forest, 45 full-time rangers and 75 part-time community based wildlife monitors and guides were trained to protect and

monitor the effectiveness of such efforts. On their very first patrol, rangers broke up a band of hardened elephant and tiger poachers, disarmed them, had them sign documents agreeing not to poach again, and then expelled them from the Cardamoms. In addition, more than 300 soldiers from the south side of the Cardamoms have been redeployed away from the park or demobilized and retrained as park rangers, thus mitigating another serious threat to the wildlife and other natural resources of this ecosystem.

## **Support for Prevention of and Investigation into Poaching of the Asian Elephant and Illegal Trade in Ivory, India.**

Although India is estimated to hold as many as 25,000 of the world's wild Asian elephants, it is speculated that about 1,000 of these are mature males (tuskers) of breeding age. The poaching of tuskers is shifting the male Asian elephant population towards the survival of tuskless males (mukhnas). To combat poaching and ivory trade, illegal in India since 1991, the Wildlife Protection Society of India (WPSI) has worked to gather information on the ivory trade and provide legal assistance to increase prison sentences for elephant poaching and ivory trade crimes. During 2000, information gathered by WPSI led to three ivory seizures in India and also helped arrest a number of ivory dealers and traders. The critical need for this type of work was further emphasized in January 2001, when five tuskers were poached in the Corbett National Park, in what is widely viewed as one of India's most important and best managed National Parks.

*Illegal timber felling and encroachment onto protected areas has seriously degraded areas of biodiversity-rich elephant range.*

*An Assam Forest Department security detail patrols an encroached area in the Sonai Rupai Wildlife Sanctuary. This habitat forms part of the Kameng-Sonitpur Interstate Elephant Reserve 1 of 11 formally identified elephant reserves in India.*

Karl Stromayer



# Management in Important Elephant Range

The effective management and maintenance of core protected areas remains a foundation for all national conservation strategies that fall within the range of the Asian elephant. These core areas, whether classified as national parks, wildlife sanctuaries, or forest reserves, are the anchors upon which the survival of the Asian elephant depends. Typically, these areas are important reservoirs of biodiversity, natural processes and endangered species alike. The Fund's projects have helped bring better management to such internationally renowned protected areas as Sri Lanka's Yala National Park and Biosphere Reserve, Burma's Alungdaw Kathapa National Park, Vietnam's Cat Tien National Park, and India's Mudumalai Wildlife Sanctuary, part of the Nilgiri Biosphere Reserve.

## **Developing a Management Plan for the Conservation of Burma's Alungdaw Kathapa National Park**

In Burma's Alungdaw Kathapa National Park, the Fund supported Smithsonian Institution efforts to strengthen local park personnel capabilities and skills, as well as produce baseline data on elephant and wildlife distribution and abundance within the context of human land-use patterns and vegetation. Another component of the project documents how local communities

use forest resources. It seeks to engage communities in developing a park management plan to optimize biodiversity conservation while allowing some consumptive use of non-timber forest resources. Community participation in the development of park and elephant management plans is an essential element in protected area conservation in Burma.

## **Training in Elephant Reserve Management for the Forest Field Staff of the Tamil Nadu State Forest Department, India**

Protected areas function best when staffed and managed by dedicated, well-trained staff. With this in mind, the Fund provided support to the Tamil Nadu State Forest Department and the A.V.C. College to launch an ambitious training program for 80 Forest Department field staff in advanced elephant reserve management techniques. This program introduced trainees to the latest techniques and concepts in anti-poaching; habitat management; elephant-human conflict mitigation; monitoring and management of elephants and other key, endemic, and endangered species; community relations; and legal issues including wildlife protection and land tenure. This project raised trainees' morale and confidence, while reinforcing their sense of mission.

*Investment in human resources will continue to be essential if Asian elephants are to persist in the wild.*

*Trained and dedicated staff, such as these community wildlife rangers (far left) in Cambodia are critical to the success of conservation initiatives.*

Karl Stromayer



# Habitat and Ecosystem Conservation and Management

The greatest challenge to Asian elephant conservation is the reduction, fragmentation, and degradation of existing elephant habitat. Many protected areas are too small to adequately provide for elephant populations. This has led to the concept of managing entire landscapes to incorporate Asian elephant populations. The concept has even spawned a new term, the “managed elephant range.” The Fund recognizes that the objectives of this strategy will be achieved chiefly by reducing negative human impacts, maintaining habitat quality, and retaining connectivity between landscape patches, while accepting that complete protection of the entire landscapes is rarely possible.

## Reducing Human Impacts on Elephant Habitats in India

The world’s largest single population of Asian elephants, about 6,000 individuals, inhabits 4,247 square miles (11,000 km<sup>2</sup>) in the Nilgiri and Eastern Ghats mountains in the southern Indian states of Kerala, Karnataka, and Tamil Nadu. Approximately 1,400 miles (2,300 km) to the north, in the states of Uttar Pradesh and Uttarakhand, another critically significant elephant population of 1,000 individuals inhabits the Rajaji - Corbett elephant reserve. The landscapes upon which these elephants depend are threatened by unsustainable domestic cattle and buffalo grazing. For example, currently 900 Gujjar families (a semi-nomadic forest dwelling people dependent on grazing) and 10,000 cattle reside inside the Rajaji National Park, an area that should form a core protected zone of high quality habitat. In both regions, poorly managed grazing systems have favored the colonization of invasive weed species and reduced palatable forages preferred by elephants. In addition, the close proximity of wildlife and cattle likely has led to the transmission of disease back and forth between wild and domesticated species. It is notable that anthrax continues to kill elephant and cattle in both areas.

To counter these threats and improve habitat quality for elephants, the Fund, Friends of the Doon Society, local communities, Uttarakhand Forest Department, and Government of India (in the north) and the A.V.C. College, local communities, Tamil Nadu Forest Department, and Government of India (in the south) have established projects to get cattle out of the forests. Both projects focus on shifting animal husbandry techniques from free range systems based on large numbers of poorly managed cattle inside parks to alternative livelihoods that are more environmentally benign; such as staff feeding cattle and sericulture.

## Maintaining Connectivity in Landscapes Essential to the Survival of the Asian Elephant

The Fund supported four projects focused on the goal of maintaining wildlife corridors or passages between protected areas containing elephant populations. Corridors are considered crucial to elephant survival in Asia in the long term, as most isolated protected areas, being “habitat islands,” do not allow for adequate dispersal and recolonization, necessary to reduce extinction probabilities. One of these projects in Thailand, implemented by HAT, a local non-governmental organization, partnered with local people and the Thai Royal Forestry Department to develop and implement a plan to restore a 2,275 foot-long (700 meter) elephant corridor that separates the Ang Luenai Wildlife Sanctuary and the Khao Chamao National Park. If successful, this project will be the first elephant corridor restored in Thailand. The corridor was formerly a flash point for elephant-human conflict due to the production of banana, coconut, cassava, and other crops favored by elephants. Under the project, these crops are being replaced by plants unpalatable to elephants, so the elephants will move between the protected areas and not linger in the corridor.

*A Thai Government resource manager discusses plans to create an elephant corridor linking Ang Luenai Wildlife Sanctuary and Khao Chamao National Park in southeast Thailand.*

HAT



# Surveys and Monitoring

Asian elephants, being highly mobile animals of forests and grassland-forest mosaics are challenging animals to study. Because of this, the distribution and number of elephants remaining in more than half the range states was poorly known when the AsECA was signed into law in 1997. The Fund has supported the use of numerous methods commonly used to assess the distribution and abundance of Asian elephants, including line transect, direct count, capture/recapture, and reconnaissance techniques. In addition, the Fund has invested in the improvement of standard techniques such as line transect dung counts and the development and testing of new techniques such as camera trapping, infrasound, and fecal DNA analysis, which may also be applied as capture/recapture techniques.

## **Assessing the Distribution and Abundance of Asian Elephants in Cambodia**

During the 1990's, Cambodia emerged from more than three decades of war and civil strife. While anecdotal reports suggested that elephants were still found in several provinces, no reliable information existed on the densities or distribution of elephants and other large mammals. This information was essential to the development of conservation strategies for Cambodia's existing protected areas and to plan for the declaration of new ones. To help bridge this gap, the Fund launched two projects to assess the distribution and abundance of Cambodia's elephants and other large mammals, and also to assess levels of poaching pressure and habitat destruction, perceived as immediate threats to Cambodia's elephants. The projects were implemented by Fauna and Flora International, the World Wide Fund for Nature, and the Wildlife Conservation Society, in close cooperation with the

Cambodian Ministry of Environment and Ministry of Agriculture, Forestry, and Fisheries. Both projects focused on capacity building, training more than 20 Cambodian biologists to plan, conduct, interpret, and develop protected area management strategies based on wildlife surveys and monitoring. Results revealed that Cambodia's elephant population had been seriously depleted, but small populations of elephants, 300-500 in total, inhabited extensive areas of high-quality habitat. In addition, a survey techniques manual was completed in the Khmer language and a National Elephant Management Plan was initiated.

## **Action Research for Conservation of Asian Elephants in Bangladesh**

Sporadic, short-duration surveys have been conducted on elephant distribution, abundance, and crop-raiding patterns in Bangladesh since the 1970's, which suggest that Bangladesh contains elephant habitat crucial to the survival of transboundary elephant populations shared with India and Burma. Still, the status of the Asian elephant in Bangladesh is unclear. With this in mind, the World Conservation Union (IUCN) Bangladesh country office, Bangladesh Forest Department, and University Partners initiated a project with the Fund to conduct a field assessment of elephant distribution and abundance in Bangladesh, and develop a national guideline to mitigate threats to elephants in the wild. A strong training component to this project links the Bangladeshi team with biologists from the Indian Institute of Science and Columbia University for training and implementation of dung count and fecal DNA population estimation tools. This project will culminate in a national level workshop to prioritize short, medium, and long term actions needed for elephant conservation in Bangladesh.

*The dense forests of Southeast Asia make assessing elephant abundance by direct observation or mark-recapture techniques very difficult. In such forests, sign surveys (such as counts of dung, tracks, and feeding signs) may be conducted to provide indices or estimates of abundance.*

*A Cambodian community wildlife ranger examines fresh elephant sign to monitor and ultimately help protect elephants remaining in the Cardamom Mountains.*

Karl Stromayer



# *Applied Research on Elephant Populations and Habitat*

The Fund encourages science-based conservation. This entails research on important aspects of elephant biology, ecology, and behavior. Such information is useful to help increase population numbers and improve the management of Asian elephants and their habitats. The development of new methods to research and manage elephants and their habitats is also supported by the Fund. Under this umbrella, projects examining refinement of elephant population estimation techniques based on indirect methods, conservation genetics, pheromones, deforestation patterns, and identification of elephant corridors have been conducted.

## **Improving Indirect Techniques to Estimate the Numbers of Forest Dwelling Asian Elephants**

A major component of a 3-year study supported by the Fund and conducted by the Wildlife Conservation Society in close cooperation with the Indonesian Government's Directorate General of Forest Protection and Nature Conservation (PHKA) in Sumatra's Lampung Province focused on developing and testing indirect methods of estimating elephant population size. Locally, the need for this study became apparent when it was realized that defecation rate, decay rate, and decay stages, variables needed to optimally convert estimates of elephant dung into elephant density, were unknown for Sumatra and elsewhere in Southeast Asia. Early project implementation focused on establishing deposition and decay rates, and comparing different methods of sampling forest blocks for dung density. A large number of PHKA staff were trained to conduct elephant surveys using indirect methods and, the first

rigorously derived, science-based estimate of elephant numbers for two important national parks in Sumatra was achieved. In addition, potentially useful relationships between camera trapping of elephants and dung counts were revealed. This project likely will have considerable international impact because the CITES Monitoring of the Illegal Killing of Elephants (MIKE) mandate has highlighted the possibility that harmonized methods may ultimately be employed by elephant-range states to assist with international decision making regarding the trade of elephant products. In Southeast Asia, to date, this project has conducted the most comprehensive, applied research on monitoring elephant populations using indirect dung count methods.

## **Conservation Genetics of the Asian Elephant**

The Fund supported a project with Columbia University's Center for Environmental Research and Conservation to develop and field test molecular methods to non-invasively estimate population size, sex ratios, and reproductive success of individual male elephants using fecal DNA analysis. The use of fecal DNA analysis will likely be a useful tool in estimating Asian elephant population size, distribution, and seasonal movements as it permits, for the first time, the identification and sexing of individual Asian elephants from dung samples. This project also prioritized the training of Asian elephant range-state biologists in conservation genetic theory, laboratory methods, and field applications. Training will benefit the development of elephant and other endangered species conservation work in diverse nations in the future.

*The fund supports development of greater knowledge concerning the genetic diversity and variability of the Asian elephant.*

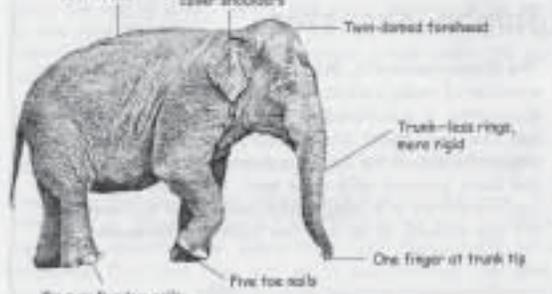
*Staff from the Wildlife Conservation Society and the Indonesian Ministry of Forestry and Estate Crops monitor elephant dung decay rate and prepare to transport dung samples to plots in the forest where dung decay rate is systematically studied under varying micro climactic conditions.*

The Wildlife Conservation Society

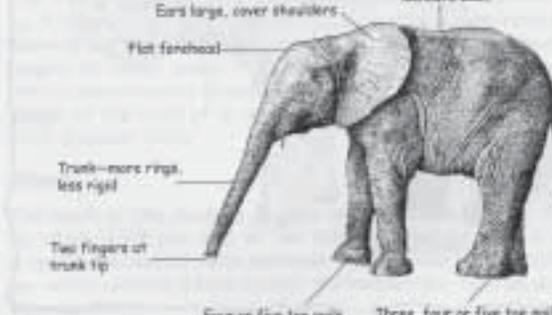
# Elephantasy

### Asian and African Elephants: How are they Different?

**Asian elephant (*Elephas maximus*)**

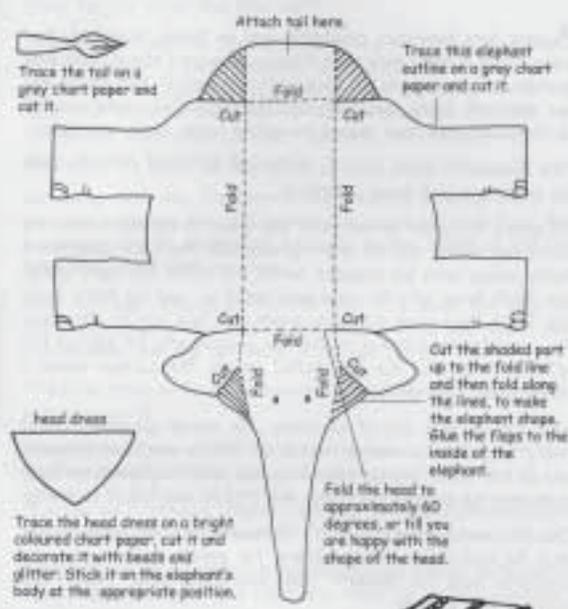


**African elephant (*Loxodonta africana*)**



Ele Fun 

### Make Your Own Elephant



Attach tail here

Trace the tail on a grey chart paper and cut it.

Trace this elephant outline on a grey chart paper and cut it.

Cut

Fold

Fold

Cut

Cut the shaded part up to the fold line and then fold along the lines, to make the elephant shape. Glue the flags to the inside of the elephant.

head dress

Trace the head dress on a bright coloured chart paper, cut it and decorate it with beads and glitter. Stick it on the elephant's body at the appropriate position.

Fold the head to approximately 60 degrees, or till you are happy with the shape of the head.

Using the bright coloured chart paper cut out a rectangle 10 cm x 4 cm. Decorate it with beads and glitter. Stick it on the elephant's body at the appropriate position.



Pages and drawings from "Elephantasy," a children's book created under a project focused on providing a year-long Asian elephant conservation education program to 10-14 year old students in more than 900 schools throughout India.

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# Conservation Education

Conservation education is critical to the development of positive attitudes towards conservation and the environment. At the same time, the diversity of environmental topics and the wide range of teaching approaches makes designing, implementing, and evaluating conservation education campaigns quite challenging. However, the potential dividends of conservation education via long-term changes in societal behavior make this field an essential part of many conservation efforts supported by the Fund; particularly when these efforts are integrated into more comprehensive initiatives.

## School Education to Support Asian Elephant Conservation

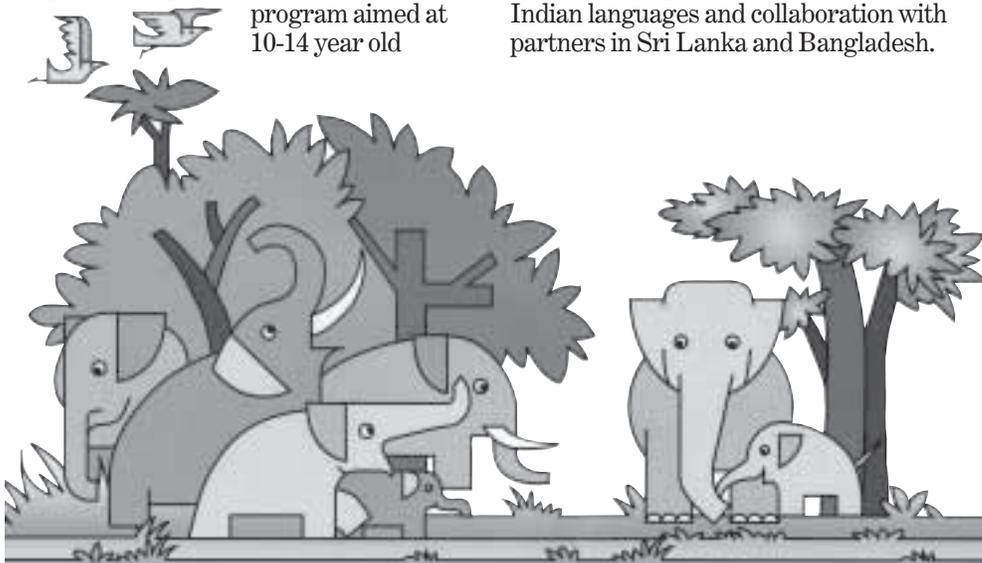
With the firm conviction that targeting the attitudes of schoolchildren in India today will make a difference 10-20 years from now, the Centre for Environment Education (CEE) in Ahmedabad, India, designed a comprehensive education

program aimed at 10-14 year old

schoolchildren as one way to ensure the long-term survival of the Asian elephant. The first phase of this project developed an educational package consisting of a teacher's manual, student's workbook, and posters. These excellent materials covered many aspects of Asian elephant ecology, natural history, and threats. Distributed for peer review internationally, these materials have become widely acclaimed and sought after. Subsequently, teachers at a network of more than 900 schools throughout India received training in the use of these materials. In addition, this network of schools was paired with a national network of non-governmental organizations to ensure simultaneous outreach to the local communities in each school district. The second phase of this project will train 700 additional teachers to implement the Asian elephant conservation education program in the 12 Indian states where elephants are most abundant. This phase will also see the translation of project materials into nine Indian languages and collaboration with partners in Sri Lanka and Bangladesh.

*“It is widely accepted that attitudes towards the environment are shaped early in life. And it is these attitudes which govern the kind of decisions that adults take, in their personal and professional capacities. It is in this context that it is important to reach out to children, to inculcate values and attitudes towards wildlife conservation, in order to lay the foundation of a conservation ethic in the general public.”*

CEE



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# *Transboundary Elephant Management*

The creation of transfrontier conservation areas (TFCA's) aims to maximize the size of conservation areas by involving two or more partner nations. Taken in the context of preserving traditional migration routes of highly mobile species, such as elephants, and preserving large tracts of habitat where ecosystem level processes can continue in a "natural" way, this approach has considerable conservation merit. Perhaps due to tense border relations and security concerns slowing down the pace of development and establishment of infrastructure along many international borders, there remains considerable opportunity for the Fund to assist in the development of TFCA's to support elephant conservation in South and Southeast Asia.

## **The Old Elephant Route**

India and Burma share a 915 mile (1,472 km) border dominated by several small mountain ranges, effectively dividing much of northeast India from the rest of Southeast Asia. Despite the importance of maintaining gene flow between Indian and Burmese populations of elephants, very little has been known about their status and migratory patterns in this region.

The Fund supported the first baseline data compilation on elephant distribution and seasonal movements in this area, by joining forces with the Aane Mane Foundation and the Asian Elephant Research and Conservation Centre. The project conducted reconnaissance surveys of this rugged border region in 2000 and 2001 and found minimal evidence of elephant movements between Burma and India. However, a substantial population of elephants was found inhabiting the western border of the Namdapha National Park in India's State of Arunachal Pradesh. Perhaps the greatest conservation benefit these surveys provided was documenting the heavy subsistence and market poaching and encroachment by local peoples in the Namdapha National Park. This project heightened international awareness of the challenges faced by managers of this park rich in plant and animal diversity. In addition, a state-wide survey of elephant populations in Auranachal Pradesh organized by the Government of India's Project Elephant is underway and attention is being focused on how to best address the needs of some 500 local people inhabiting the Namdapha National Park.

*Agricultural lands along Xishuangbanna National Nature Reserve in Yunnan Province, China, border a distant mountain landscape in the Lao Peoples Democratic Republic. With more than 300 elephants, Xishuangbanna is China's most important elephant reserve. Excellent potential exists for transboundary elephant management between China and the Lao Peoples Democratic Republic.*

Karl Stromayer



# *Development and Execution of Elephant Conservation Action Plans*

Conservation planning, with the full input of all stakeholders, is encouraged by the Fund. Range-Wide Conservation Action Plans serve as useful tools in educating all interested parties, and also help to coordinate efforts among stakeholders to conserve species across their ranges.

## **Updating the Asian Elephant Action Plan to Help Prioritize and Coordinate Conservation Actions**

A Fund project assisted The World Conservation Union (IUCN's) Species Survival Commission for the conservation of the Asian elephant update a 1990 Action Plan. Size, trend, and status of each elephant population in all range states was collected in the updated plan. This information will help prioritize certain elephant populations for concerted conservation action. The Fund is also supporting the development of National Action Plans for Asian elephant conservation in Cambodia and Bangladesh.

*“The Asian elephant is the ultimate flagship for broader conservation concerns in Asia. There is no other example of a species that can be used as a window to address such a wide array of concerns, ranging from biological diversity and national planning to integrated rural development.”*

**Asian Elephant Specialist Group, IUCN**

*A family of elephants crosses a road in the Moyar valley, an important elephant habitat essential to the free movement of elephants between the Nilgiri and Eastern Ghats mountain ranges of southern India.*

Karl Stromayer



*The fate of the domesticated Asian elephant is in doubt as demand for elephant work decreases and elephant keeping cultures gradually adopt new livelihoods.*



USFWS/Fred Bagley



USFWS/David A. Ferguson



Karl Stromayer



# *Domesticated Asian Elephant - Opportunity for Wild Asian Elephant Conservation?*

Reintroduction of domesticated elephants into the wild in areas where they have been extirpated makes sound ecological sense, and experiments with this technique have shown promise in Thailand. This concept is also consistent with developing strategies to deal with large numbers of domesticated elephants effectively displaced by modernization and the decline of elephant husbandry. For example, approximately 4,000 domesticated elephants in Thailand are largely without traditional work. In the last 10 years alone, 500 elephants have been captured and held in “elephant conservation centers” in Sumatra, Indonesia.

Unfortunately, given that the primary threat to the Asian elephant is conversion of habitat to agriculture and urbanization, reintroduction to the wild will likely not be a solution for the large percentage of the world’s surplus domesticated Asian elephants. Rather, it may be more appropriate to manage the domesticated Asian elephant as part of an integrated strategy to promote the conservation of the species as a whole. Culturally appropriate use of domesticated Asian elephants in ecotourism, sustainable forestry/green logging, crop protection/mitigation of elephant-human conflict, law enforcement patrolling, buffer zone management, ecological monitoring, and appropriate reintroduction, may be more

environmentally friendly and economically sustainable than the introduction of mechanized and capital intensive schemes, which may also be destructive to local cultures.

## **Using the Domesticated Asian Elephant to Help Support Conservation of the Wild Asian Elephant**

Patrol elephants have the ability to access remote, waterlogged terrain, giving rangers a critically needed advantage in patrolling many river flood plains that contain critical (wild) elephant habitat dominated by grasses that normally grow well over human head height. In Assam, India, routine and emergency veterinary care was provided to 100 Forest Department patrol elephants through the Fund’s support to mobile veterinary teams organized by the Rhino Foundation for Nature in North East India. In Aceh, Sumatra, Indonesia, the Fund sponsored a comprehensive project implemented by Fauna and Flora International in conjunction with the Indonesian Government’s Directorate General of Forest Protection and Nature Conservation and local communities. Among accomplishments achieved, this project established a series of elephant “Conservation and Response Units,” which use domesticated elephants to reduce elephant-human conflict, detect illegal logging, and monitor forest encroachment.

*“Many difficult questions are posed by Asia’s domesticated elephants. Are they an invaluable resource in wildlife conservation? Or are they an outdated cultural relic which should be allowed to fade away? What do they represent to the nations that possess them? What do they mean to the West? Is it incumbent on man to extend, if not manage, at least a degree of succor to these troubled animals?”*

**Gone Astray. The Care and Management of the Asian Elephant in Domesticity.**  
R. Lair

# Summary of Grants 1999-2001

***Bold type within individual summary indicates project matching or in-kind funds.***

*School Education to Support Asian Elephant Conservation, India (AsE-0006).* Centre for Environment Education. \$44,500 + **\$16,250**—Design and produce an educational package of elephant conservation materials (teachers workbook, students workbook, and posters); and apply these materials to educational programs in more than 900 schools in India.

*A Proposal to Determine the Movement Patterns of Elephants in southern Sri Lanka and Provide Recommendations for Conservation Management, Sri Lanka (AsE-0007).* Biodiversity and Elephant Conservation Trust. \$15,085 + **\$1,028**—To establish a monitoring system for elephants inhabiting the Handapanagala area of Sri Lanka, historically a flash point for elephant-human conflict, and to conduct outreach activities in the surrounding villages.

*Conservation Assessment for Sumatran Elephants in Lampung Province, Sumatra, Indonesia (AsE-0008).* Wildlife Conservation Society. \$61,750 + **\$53,580**—Development of techniques to assess Asian elephant distribution, abundance, seasonal movements, and patterns of conflict with humans in Sumatra, Indonesia; followed by training of Indonesian biologists and implementation of an elephant monitoring and conservation program.

*To Trace the Mobility Patterns, Population Dynamics, and Feeding Patterns of Sri Lankan Elephants in a Select National Reserve of Sri Lanka (AsE-0010).* Mr. S. Miththapala. \$26,176 + **\$18,110**—To establish a monitoring system for the elephants inhabiting the Uda Walawe National Park, one of the richest elephant habitats in Sri Lanka.

*Identification of a Managed Elephant Range for Inclusion in Riau Province's 2000-2004 Five-Year Land-Use Plan, and Provision of Emergency Aid to Riau's Elephant Management Unit, Indonesia (AsE-0011).* World Wide Fund for Nature, Indonesia. \$54,590 + **\$58,531** (\$49,531 WWF U.S.; \$9,000 Riau Government)—Development and adoption of a province-wide land use plan that establishes a protected area—Tesso Nilo—for elephant conservation.

*Identification of a Suitable Managed Elephant Range, and Establishment of an Elephant Conflict Mitigation Training Program, Malaysia (AsE-0012).* World Wide Fund for Nature, Malaysia. \$49,973 + **\$42,434** (Sabah Wildlife Department)—Assess the distribution, abundance, seasonal movements, and conflicts with humans, of elephants in the Lower

Kinabatangan river region and the Daramakoth Forest Reserve in support of developing a managed elephant range for elephant conservation.

*The Old Elephant Route, Burma and India (AsE-0014).* The Aane Mane Foundation. \$49,212 + \$37,770 (\$20,000 Applicant; \$17,770 Governments of India and Burma)—Reconnaissance surveys of elephant distribution along the Indian border with Burma and an assessment of threats to elephants and other wildlife at the Namdapha National Park in Arunachal Pradesh, India.

*Aceh Elephant Project: Elephant Conservation and Response Units, Indonesia (AsE-0015).* Fauna and Flora International. \$49,550 + \$140,025 (\$105,625 Global Environment Facility; \$34,400 Private Donation; Additional in-kind contributions by the Aceh Province Directorate for Conservation)—A survey of the distribution and abundance of elephants in Aceh Province and development of elephant-human conflict mitigation measures based on the use of domesticated Asian elephants.

*Prevention of and Investigation into Poaching of the Asian Elephant and Illegal Trade in Ivory, India (AsE-0017).* Wildlife Protection Society of India. \$32,740 + \$30,410—Gather information on elephant poaching and illegal ivory trade in India, to assist prosecuting authorities, and increase public awareness concerning these threats.

*Molecular Tools for the Local Population Assessment of Asian Elephants, U.S.A. (AsE-0020).* Center for Environmental Research and Conservation, Columbia University. \$35,390 + \$51,088 (\$26,392 Applicant; \$24,696 WWF U.S.)—Develop, validate, and use techniques to individually identify and sex Asian elephants from fecal DNA samples; including training of range country scientists in conservation genetics and field applications.

*Promotion of Elephant Conservation in Asia (Publication of GAJAH), Sri Lanka (AsE-0022).* The World Conservation Union (IUCN) Asian Elephant Specialist Group. \$9,000 + \$6,600—Publication of the journal of the Asian Elephant Specialist Group, GAJAH; this journal has a broad readership and serves as an important source of information to promote the conservation and management of the Asian elephant.

*Elephants in Crisis, Conservation of the Asian Elephant in a Human Dominated Landscape in Vietnam (AsE-0024).* Fauna and Flora International. \$56,610 + \$77,209 (\$13,850 Applicant; \$63,359 Government of

*The fund is supporting three projects that directly address elephant-human conflict in Sumatra, Indonesia. In North Sumatra, Fauna and Flora International is working closely with the Provincial Directorate for Conservation to use domesticated Asian elephants to drive crop raiding elephants out of cropfields. An identical approach is being tested in Way Kambas National Park, in*



*Lampung, by the Wildlife Conservation Society in conjunction with the Indonesian Government's Directorate General of Forest Protection and Nature Conservation. In Riau, the World Wildlife Fund is working with the Riau-based federal Conservation Authority, the Indonesian Ministry of Forestry, and other partners to create an elephant reserve and halt encroachment and habitat destruction.*

# Summary of Grants 1999-2001

(continued)



Aster Z. Li, IFAW China



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WWF Indonesia

*Asian elephants occupy a diverse array of habitat and ecosystem types from the evergreen forests of southern China (top) to seasonally inundated river floodplains and moist forests in India's northeast and dry forest in western India, to palm oil plantations in Indonesia (bottom).*

the Netherlands)—Training in elephant population survey techniques followed by assessment of the status of the Asian elephant in Vietnam and bioregional planning based on the results of wildlife surveys.

*Support for Improved Health and Health Care Management of Captive Populations of Sumatran Asian Elephants, Indonesia (AsE-0029).* International Elephant Foundation. \$50,000 + \$143,200—Provision of emergency assistance with equipment and training of Indonesian veterinary staff in support of the health care of captured, wild Asian elephants displaced by economic development in Sumatra, Indonesia.

*Pheromones as Aids to Prevent Crop Raiding by Asian Elephants in Range States (AsE-0030).* The Oregon Institute of Science and Technology. \$6,500 + \$6,500 (\$5,940 Applicant; \$560 Riddles Elephant Sanctuary)—Testing, in controlled situations, the efficacy of pheromones and other chemical signals to modify elephant feeding behavior.

*Managing Three Critical Elephant Ranges in Burma (AsE-0036).* Conservation & Research Center, Smithsonian Institution. \$49,292 + \$91,190 (Burma Ministry of Forestry)—Training of Burmese biologists in elephant population survey techniques, assessment of elephant and other wildlife distribution and abundance, and human impacts on forest resources, followed by participatory protected area planning.

*Construction of Anti-Poaching Camps in Sonai Rupa Sanctuary, India (AsE-0043).* Forest Department of Assam. \$35,085 + \$64,609—Infrastructure development to support protection of elephant populations and elephant habitat being heavily threatened by armed encroachers in the heart of the Kameng-Sonitpur Elephant Reserve.

*Investigating the Status of Asian Elephants in the Cat Tien National Park and its Management Implications, Vietnam (AsE-0001).* WWF Indochina Program. \$49,550 + \$9,350—Training in elephant survey field techniques, data storage and analysis, reporting, and outreach activities in support of elephant conservation in a major Vietnamese elephant range.

*Elephant Conservation in Cambodia: National Capacity Building and Initial Surveys (AsE-0031).* WWF Cambodia Project and the Wildlife Conservation

Society. \$52,362 + **\$31,500** (\$20,000 WWF; \$11,500 WCS)—Training of Cambodian biologists in elephant and wildlife survey techniques and assessment of elephant distribution, abundance, and seasonal movements in potentially important elephant ranges.

*Resettlement of the Gujjars of the Rajaji National Park, India (AsE-0033).* The Friends of the Doon Society. \$37,006 + **\$10,500**—Implementation of sustainable development activities including stall feeding of cattle that reduce the impact of local communities on elephant habitat in the Rajaji National Park, a critical habitat for one of India's most important elephant populations, inhabiting the Rajaji-Corbett Elephant Reserve.

*Resolving Elephant-Human Conflicts in Asia: Field Testing of Deterrents and Community Participation in the Mitigation of Conflicts in Southern India (AsE-0023).* Wildlife Preservation Trust International. \$35,400 + **\$31,080** (\$18,000 Claiborne/Ortenberg Foundation; \$7,080 Applicant; \$6,000 Asian Elephant Research and Conservation Centre)—Testing of a number of specific deterrents (including electric fences, railway tracks, aerosol repellants, and pheromones) to mitigate elephant-human conflict in south India.

*Equipping Protected Area Field Staff Within Project Elephant Reserves in India with Anti-poaching Kits (AsE-0040).* Wildlife Trust of India. \$50,790 + **\$31,276**—Provision of basic anti-poaching kits; including backpacks, boots, raincoats, and sleeping bags for 1,000 protected-area field staff at Project Elephant reserves.

*Assessment of the Conservation Status of the Asian Elephant in Cambodia and Capacity Building of Cambodian Conservation Authorities to Protect the Asian Elephant (AsE-0019).* Fauna and Flora International. \$56,970 + **\$57,080** (\$46,080 Applicant; \$11,000 IUCN Asian Elephant Specialist Group)—Training of Cambodian biologists in elephant and wildlife survey techniques and assessment of elephant distribution, abundance, and seasonal movements in potentially important elephant ranges.

*Asian Elephant Conservation Project in the Nangunhe Nature Reserve, China (AsE-0025).* Yunnan Provincial Forestry Department. \$49,540 + **\$14,400**—Develop and implement a long-term (elephant population) monitoring and habitat management program for the conservation of the Nangunhe elephants.



*Researchers collect a sample of fresh elephant dung for fecal DNA analysis in the Cardamom mountains of Cambodia. This method permits the identification and determination of sex for individual elephants from dung and also promises to be a powerful means of estimating population size using mark recapture models.*

Karl Stromayer

# Summary of Grants 1999-2001

(continued)



*Invasive shrubs, such as this lantana, are a serious threat to biodiversity and forage plant assemblages in many elephant habitats. Invasive and exotic plants degrade elephant habitat and must be controlled to prevent further reduction in carrying capacity on the world's remaining elephant ranges.*

Karl Stromayer

*Management of Elephant Reserves With Special Reference to Corridors by Community Participatory Programme in the Nilgiri Biosphere Reserve, India (AsE-0046). A.V.C. College (Salim Ali Centre for Ornithology and Natural History). \$44,982 + \$7,020—Working with local communities to minimize degradation of elephant habitat by overgrazing of cattle and collection of forest products in the Nilgiris and Eastern Ghats Elephant Reserve.*

*Developing an Elephant Conservation Strategy in Sri Lanka: Field Research, Community Based Problem Solving, and Training for Local Conservation Scientists (AsE-0018). Wildlife Preservation Trust International. \$28,200 + \$60,636 (\$33,700 Claiborne/Ortenberg Foundation, \$26,936 Applicant)—Development of strategies to promote ecotourism and thereby mitigate elephant-human conflict in the buffer zone of the Yala National Park and Biosphere Reserve.*

*A Study on the Asian Elephant in the Nakai Plateau, Lao PDR, and its Implication Towards Species Conservation and Management (AsE-0045). IUCN Lao PDR. \$44,350 + \$8,800 (\$1,600 Kunming Institute of Zoology, \$1,125 WCS, \$6,075 Applicant)—An assessment of elephant distribution, abundance, habitat use, seasonal movements, and conflicts with humans to support development of a management plan for two important elephant ranges.*

*Conservation Assessment for Sumatran Elephants in Lampung Province, Sumatra, Indonesia (Year 2) (AsE-0059). Wildlife Conservation Society. \$54,000 + \$85,562—Development of techniques to assess Asian elephant distribution, abundance, seasonal movements, and patterns of conflict with humans in Sumatra, Indonesia; followed by training of Indonesian biologists and implementation of an elephant monitoring and conservation program.*

*An Action Plan for the Conservation of the Asian Elephant (AsE-0009). The World Conservation Union (IUCN) Asian Elephant Specialist Group. \$40,000 + \$33,000 (Chester Zoo)—Production of an up-to-date assessment of the status and priority actions needed to conserve the Asian elephant throughout its range.*

*Field Training on the Management of Elephant Reserves for the Field Staff of Tamil Nadu, India (AsE-0065). A.V.C. College (Salim Ali Centre for Ornithology*

and Natural History). \$47,880 + **\$33,880** (\$28,240 Tamil Nadu Forest Department, \$5,640 Applicant)—Training in anti-poaching, monitoring of elephant populations, and management of elephant habitats for forest officers and forest guards.

*Treatment of Domestic Elephants Used for Patrolling, India (AsE-0058).* The Rhino Foundation for Nature in North East India. \$17,930 + **\$8,800**—Provision of emergency and routine health care to approximately 100 Assam Forest Department patrol elephants.

*Development of a Non-intrusive System for Protection Against Crop Raiding by Elephants, Sri Lanka (AsE-0079).* Lalith Seneviratne. \$46,350 + **\$4,300**—Development, testing, implementation, and extension concerning elephant-human conflict mitigation measures, including trip wires, infrasound, strobe lights, and seismic detectors; and, technology transfer to local communities.

*Ground Truth the Status of Land in Identified Elephant Migration Corridors for Acquisition as Protected Areas in India (AsE-0042).* Wildlife Trust of India. \$41,080 + **\$41,310**—Working with partners to identify, prioritize, and acquire elephant corridors to link important protected areas.

*Community Organization and Management of an Elephant Path Between Khao Chamao National Park and Ang Luenai Wildlife Sanctuary of Thailand (AsE-0050).* HAT. \$36,444 + **\$11,590**—Development and formal declaration of an elephant corridor and reduction of elephant-human conflict in an encroached area between two important protected areas.

*Applied Research for Conservation of Asian Elephants in Bangladesh (AsE-0028).* IUCN Bangladesh. \$51,800 + **\$15,200**—A field assessment of elephant distribution, abundance, seasonal movements, habitat relationships, and conflicts with humans in Bangladesh.

*Project Harmony with Elephants in Assam. A Pilot Project to Reduce Human-Elephant Conflict in Assam, India (AsE-0037).* Aaranyak Nature Club. \$14,600 + **\$7,500**—An assessment of elephant-human conflict in Darrang and Sonitpur Districts of Assam, India, followed by development of an elephant-human conflict mitigation strategy for the area.



Scrub cattle such as these (top and center) compete for forage and may spread potentially fatal diseases such as anthrax and foot and mouth disease to elephants and other wild mammals. The Fund supported two projects specifically targeted at the removal of (domesticated) cattle from elephant ranges (see page 17) and one promoted the confinement and stall feeding of cattle (bottom).

Karl Stromayer

# Summary of Grants 1999-2001

(continued)



*Rice wine, sold at a tea estate in Assam, India, emits a strong odor highly attractive to elephants. During the peak time for elephant-human conflict, which coincides with the annual rice harvest during October and November, many rural homes in Assam are smashed and damaged by elephants pursuing the aroma of this homemade beverage.*

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*Genetic Analysis for the Conservation of Asian Elephants (Year 2) (AsE-0083).* Center for Environmental Research and Conservation, Columbia University. \$82,485 + \$33,400—Develop, validate, and use techniques to individually identify and sex Asian elephants from fecal DNA samples; training of range-country scientists in conservation genetics and field applications.

*Protecting the Asian Elephant in the Cardamom Mountains, Cambodia (AsE-0094).* Conservation International. \$50,040 + \$95,966—Development and implementation of a protection and monitoring plan to halt wildlife poaching and habitat destruction in the Cardamom Mountains through training, equipping, and fielding 45 rangers and 75 part-time community wildlife monitors.

*Saving Elephants by Helping People: A Community Integrated Project to Resolve Human-Elephant Conflict in Sri Lanka (AsE-0087).* Sri Lankan Wildlife Conservation Society. \$37,500 + \$15,000—Construction of an electric-fence system to fence villages in and elephants out, and maintain intact elephant corridors near the Wasgomuwa National Park.

*Managing Critical Elephant Ranges in Burma (Year 2) (AsE-0091).* Conservation & Research Center, Smithsonian Institution. \$50,000 + \$123,512 (Christensen Fund)—Training of Burmese biologists in elephant population survey techniques, assessment of elephant and other wildlife distribution and abundance, and human impacts on forest resources, followed by participatory protected area planning.

*A Study of the Ecology of the Asian Elephant in the Minneriya National Park, Sri Lanka, and its Impact on the Agricultural Landscape (AsE-0081).* University of Peradeniya, Sri Lanka. \$11,160 + \$6,500—Field assessment of the distribution, abundance, seasonal

movements, and conflicts with humans, characterizing elephants in the Minneriya National Park; and training of park staff to establish an elephant monitoring program.

*Identification of Elephant Corridors Between Royal Bardia and Corbett National Parks and an Assessment of the Status of Elephants in Royal Bardia National Park: The First Step in Establishing the Western Terai Ecoregion, Nepal (AsE-0057).* University of Minnesota. \$30,530 + \$81,870 (\$29,390 WWF-Nepal; \$7,000 Norwegian Aid Agency; \$7,000 Applicant)—Use of remote sensing and Geographic Information Systems to assess vegetation status and trends, and to develop an in-depth habitat management plan for elephant.

*Asian Elephant School Education Program, India (Year 2) (AsE-0084).* Centre for Environment Education, India. \$50,500 + \$9,000—Implementation of a conservation education program targeting schoolchildren in India in the 12 States that are the home of wild Asian elephants; outreach materials will be translated into nine local languages and pilot projects will be conducted in conjunction with Bangladeshi and Sri Lankan partners.

*Pheromones as Aids to Prevention of Crop Raiding by Asian Elephants in Range States (Year 2) (AsE-0080).* Oregon Institute of Science and Technology. \$12,775 + \$6,500 (\$5,940 Applicant; \$560 Riddles Elephant Sanctuary)—Testing, in controlled and field situations, the efficacy of pheromones and other chemical signals to modify elephant feeding behavior.

*Forest Cover Change Analysis in Support of Elephant Conservation in Northern Burma (AsE-0095).* Conservation International. \$34,008 + \$20,668—Use of remote sensing and Geographic Information Systems to determine status and rates of forest cover loss and the status of elephant habitat in Burma.

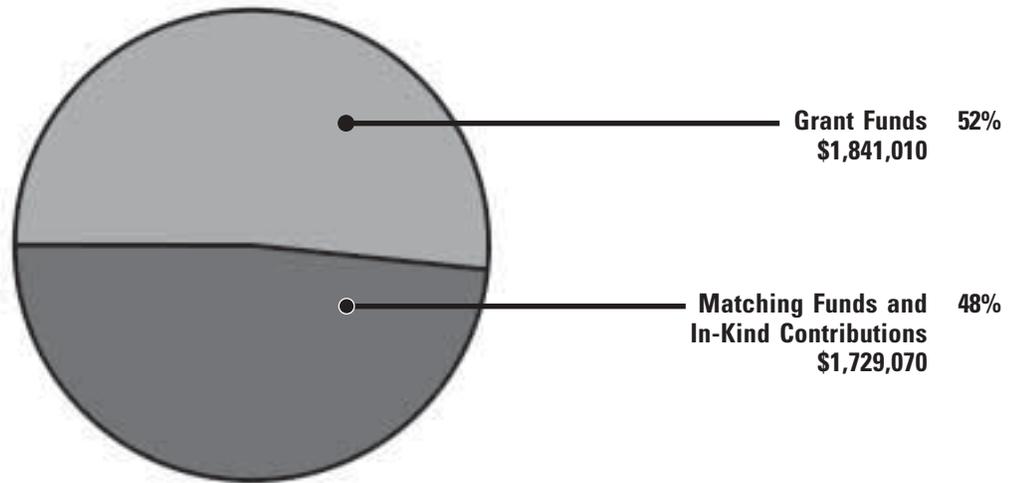


*The Fund supports the development of alternative livelihood strategies that reduce the negative impacts of humans on elephant habitats. Here a herdsman has been assisted with a sericulture (silkworm-raising) project as an alternative livelihood to free ranging cattle in the Nilgiris and Eastern Ghats Elephant Reserve in southern India.*

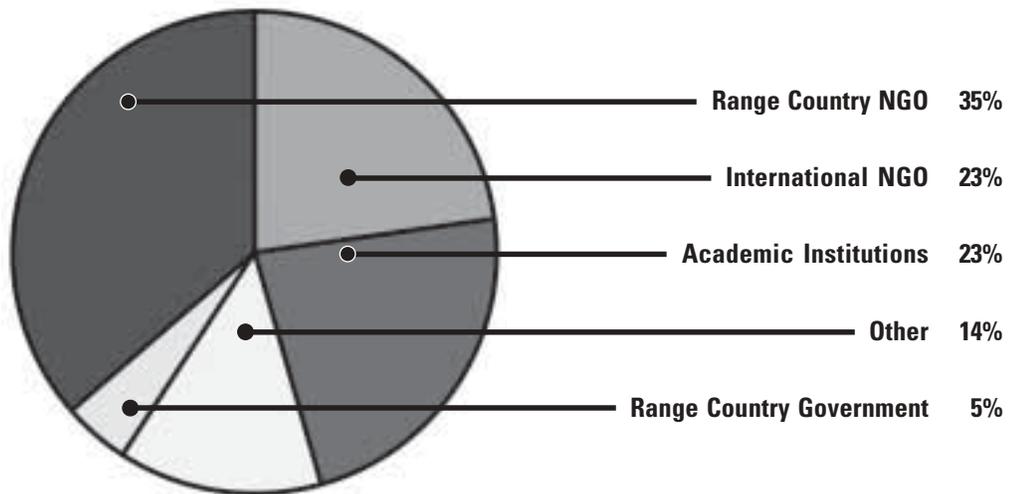
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# Distribution of Funds

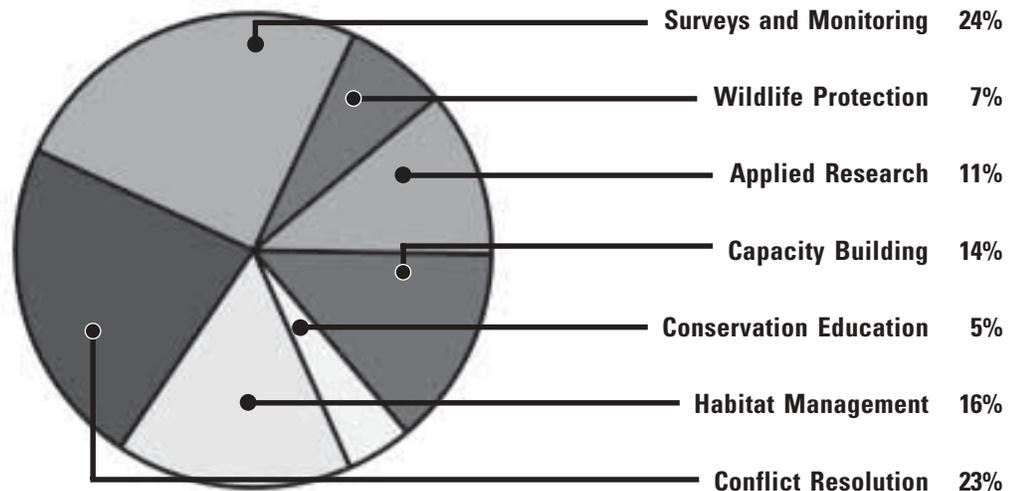
## Grant and Matching Funds



## Organizational Funding



## Program Areas



# Countries with Grants

*Fiscal Years 1999-2001*



**For more information about the Fund,  
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**Winter 2002**

