Ministry of Forestry of the Republic of Indonesia

STRATEGY AND ACTION PLAN FOR THE CONSERVATION OF RHINOS IN INDONESIA

RHINO CENTURY PROGRAM

Jakarta, 2007

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ABBREVIATIONS

AREAS	WWF's Asian Rhino and Elephant Action Strategy
AsRSG	Asian Rhinos Specialist Group (under IUNC-SSC)
BBSNP	Bukit Barisan Selatan National Park
CBD	Convention on Biological Diversity
CEPF	Critical Ecosystem Partnership Fund
CITES	Convention on Trade in Endangered Species of Fauna and Flora
EU	European Union
FFI	Fauna and Flora International
GLNP	Gunung Leuser National Park
GMPB	Global Management and Propagation Board (Sumatran rhinos)
Gov	Government
Government	Government of Indonesia
IDR	Indonesian Rupiah
IPB	Institut Pertanian Bogor
IRIS	Indonesian Rhino Information System
IRF	International Rhino Foundation
IUCN-SSC	International Union for Conservation of Nature (The World Conservation Union) – Species Survival Commission
KSNP	Kerinci Seblat National Park
LIPI	Lembaga Ilmu Pengetahuan Indonesia
NGO	Non-Governmental Organization
NP	National Park (i.e. Bukit Barisan Selatan)
NTFP	Non-Timber Forest Products
MoF	Ministry of Forestry
MoU	Memorandum of Understanding
MPU	Marine Protection Unit
PHKA	Perlindungan Hutan dan Konservasi Alam (Directorate General of Forest Protection and Nature Conservation of the Ministry of Forestry)
PKBI	Program Konservasi Badak Indonesia (Indonesian Rhino Conservation Program)
RCO	Rhino Conservation Officer
RPU	Rhino Protection Unit
RTF	Rhino Task Force
STCP	Sumatran Tiger Conservation Program
SPU	Sea Protection Unit
UKNP	Ujung Kulon National Park
UNEP	United Nations Environmental Program
UNICEF	United Nations International Children's Emergency Fund
USD	United States Dollar
USFWS-RTCF	US Fish and Wildlife Service's Rhino and Tiger Conservation Fund
WCS	Wildlife Conservation Society
WI	Wetland International
WKNP	Way Kambas National Park
WWF	World Wide Fund for Nature
YMR	Yayasan Mitra Rhino (Indonesian Rhino Foundation)

FOREWORD

Rhinos, one of the most recognized and threatened species on the planet are one of Indonesia's most important biological treasures. Our nation's two species, the Javan and Sumatran rhino, survive in only a handful of National Parks, and represent two of the most Critically Endangered large mammal species on Earth. These secretive, forest-dwelling rhinos face a number of threats ranging from illegal hunting for their horn, habitat encroachment and forest loss, and, ultimately, poverty among local communities living in and around rhino habitat.

Conserving these wondrous species requires a far-sighted strategy that incorporates the best available scientific information combined with coordination and collaboration among numerous partners, including governments, the academic community, conservation organizations, zoos and breeding centers, local communities, and others. Indonesian rhino conservation will necessitate not only sustainable scientific management, but also the full engagement and involvement of local communities, including education and awareness, and, where appropriate, alternative and sustainable livelihoods built around conservation.

The need for swift and effective action to address the crisis facing the world's five rhino species has never been greater, both in Asia and in Africa. The pages of this volume contain an excellent blueprint to guide our attention and resource allocation towards the highest priority actions that will achieve its ambitious and essential goals. It is my hope that the Rhino Century Program will not only focus the world's attention on conserving Indonesia's rhinos, but also encourage bold and positive action among all stakeholders involved in its implementation. Together, we will set the course of recovery for Indonesia's rhinos, ensuring their survival for future generations.

Honorable Minister
Ministry of Forestry

ACKNOWLEDGEMENTS

The Rhino Task Force would like to acknowledge the inputs of all people who participated in the meeting on 27 and 28 February 2006 during which the outline of this document was presented and discussed. This meeting brought together managers of Protected Areas holding rhinos, scientists, Government of Indonesia officials and members of the conservation non-governmental organization community. The meeting called for the establishment of a rhino task force with the responsibility to coordinate, guide and encourage rhino conservation work in Indonesia.

The Rhino Task Force is encouraged by the strong support obtained from authorities in the Government of Indonesia and the management boards of the Protected Areas holding rhinos. We would like to thank the Directorate General of Forest Protection and Nature Conservation for the insights, support and encouragement as well as Dr. Nico J. van Strien (International Rhino Foundation), Mr. Gert Polet (WWF - International), and, post-humously, to thank Dr. Thomas J. Foose (former Program Director of the International Rhino Foundation) for their initiative, coordination and contribution in preparing and developing this very important document. We hope that as a result of these efforts, conservation activities in general and rhino conservation in particular will be stepped up further and the momentum maintained well into the future.

The Rhino Task Force wishes to thank the US Fish and Wildlife Service's Rhino and Tiger Conservation Fund for financially assisting the consultative meeting and for their continued support to rhino conservation work in Indonesia in general. The United Nations Development Program's Global Environmental Facility, the Critical Ecosystem Partnership Fund and the European Union have been important donors for rhino conservation work and we encourage them and other aid agencies to continue their support of efforts in this important field.

The *Program Konservasi Badak Indonesia* (Indonesian Rhino Conservation Program), *Yayasan Mitra Rhino* (Indonesian Rhino Foundation), *Yayasan Suaka Rhino Sumatera* (Sumatran Rhino Sanctuary), the International Rhino Foundation, the World Wide Fund for Nature, the Leuser International Foundation not only are active in rhino conservation work in the field, they also actively supported the formulation of the Rhino Century Program in numerous ways. We hope that this document and the program of action recommended for the protection of rhinos will be supported by the constituencies of these NGOs so that support commensurate with the challenge ahead will be available in the future.

This document outlines the targets and direction for rhino conservation work in Indonesia, and we are hopeful for a fruitful collaboration between all parties involved in conserving these magnificent species. Our efforts must be accelerated and intensified in order to safeguard the survival of Javan and Sumatran rhinos in Indonesia. We hope that this document will provide a blueprint for this endeavor.

Lastly and most importantly, we wish to thank all the forest guards and rhino protection unit members for their daily work to protect rhinos and their habitat. Without the dedication of these people, who often put their lives on the line, wild rhino populations could already have been decimated. The daily hardship these dedicated people encounter during forest patrols is deeply appreciated. We hope that the implementation of this Program will also provide opportunities and additional safeguarding of staff working in the front lines of rhino conservation.

Chair *ad interim*
Rhino Task Force

EXECUTIVE SUMMARY

The Strategy and Action Plan for The Conservation Rhino in Indonesia (Rhino Century Program) is the Government of the Republic of Indonesia's official policy for the conservation of the country's rhino populations. The Program was formulated in a consultative process including all Protected Areas holding rhinos, responsible authorities of the Government of Indonesia (GOI) and Non-governmental Organizations (NGOs) involved in rhino conservation work. During the process, held 26-27 February 2007, a provisional Rhino Task Force was installed. This group is responsible for guiding and documenting the implementation of this Program. The Rhino Century Program was officially announced by the GOI during the President's speech on 5 November 2007 for *Hari Cinta Puspa dan Satwa* (National Plant and Animal Day).

Indonesia harbors two of the world's five rhino species, the Javan rhino (*Rhinoceros sondaicus sondaicus*) and Sumatran rhino (*Dicerorhinus sumatrensis*). Both species are listed as classified as Critically Endangered on IUCN's *Red List of Threatened Species*. With at most 60 Javan rhinos (world population 65) and at most 185 Sumatran rhinos (world population 275), Indonesia the country holds the majority of these rhinos and thus has an enormous responsibility to conserve the two species. The Javan rhino population is confined to Ujung Kulon National Park and has languished in size for the last 25 years. If the current slight decrease of Javan rhinos continues, the population will have been halved before the end of this century. Sumatran rhinos are primarily confined to Bukit Barisan Selatan, Way Kambas and Gunung Leuser National Parks and their numbers also have decreased considerably in the last two decades.

Poaching and habitat loss pose the primary threats to the survival of both Javan and Sumatran rhinos. Illegal encroachment on National Parks occurs throughout Indonesia. The carrying capacity for Javan rhinos in Ujung Kulon National Park appears to already have been reached, with hardly any room for expansion of the population. Poaching was brought under control in the late 1990's, mainly because of the establishment of Rhino Protection Units but poaching will always remain a potential threat. Anthropogenic pressure put on rhinos is mainly caused by poverty (resulting in needs for more agricultural land and encroachment) and demand for rhino parts (resulting in poaching).

The ultimate goal of the Rhino Century Program is *to create conditions conducive to and then actually develop viable populations of Javan and Sumatran rhinos in the wild.*

The Rhino Century Program identifies ambitious goalss for the growth of rhino populations in Indonesia, with a target of a 3% annual increase. If successful, this will result in 550-1,100 Javan rhinos by 2075, including at least one population of 500 animals. By 2045, there should be 790-1,150 Sumatran rhinos, including two populations of 400-500 animals. More immediate targets are to have 70-80 Javan rhinos and 290-310 Sumatran rhinos by 2017.

Over the next 5 years (2007–2012), the following short-term objectives will be pursued to contribute towards the long-term goal:

1. Maintain and then expand by 20% the wild population of Javan rhinos in Ujung Kulon National Park.

2. Establish one additional Javan rhino population elsewhere through translocations after identifying and securing adequate (> 400,000 ha) additional habitat.
3. Establish one Javan rhino Sanctuary as insurance for the existing *in-situ* conservation program.
4. Expand the wild population in Gunung Leuser, Bukit Barisan Selatan and Way Kambas National Parks by at least 40%,
5. Secure adequate habitat for viable wild populations in Kerinci Seblat National Park (500,000 ha), Bukit Barisan Selatan National Park (100,000 ha), Gunung Leuser National Park (700,000 ha) and in Kalimantan (500,000 ha).
6. Successfully breed Sumatran rhinos in sanctuaries for re-introduction purposes.

These Objectives will be attained through a protracted, consistent effort, coordinated by the Rhino Task Force, in which the authorities of the GOI and NGOs work together. A set of immediate Actions have been identified for:

- Protection
- Habitat Management
- Population Management
- Co-Existence of Rhinos with People
- Research

The highest priority is to continue providing adequate security for existing rhino populations through the deployment of specially formed, trained and equipped Rhino Protection Units.

Expansion of secure habitat is required for populations to be able to grow. In the case of Sumatran rhinos, there is sufficient habitat available within Protected Areas on Sumatra Island, but these areas need to be secured with better protection. Priority is to be given to securing the northern parts of Bukit Barisan Selatan National Park, additional areas in Gunung Leuser National Park and re-installing security in Kerinci Seblat National Park. Large tracts of habitat available in Kalimantan need to be identified, earmarked for future Sumatran rhino populations from Malaysia, and secured. Because Ujung Kulon National Park can not support many more Javan rhinos, new areas need to be identified and secured within the historic range of Javan rhinos on the islands of Java and/or Sumatra. In the future, these new areas will be re-stocked with Javan rhinos, but in the shorter-term, they need to be protected immediately from development and extractive industries. In the short term, and as an intermediate solution, the Rhino Century Program calls for active habitat management and manipulation of the Javan banteng (*Bos javanicus javanicus*) population in Ujung Kulon National Park to provide for better feeding opportunities for Javan rhinos.

The most important rhino population management activity to be pursued under Rhino Century Program is the establishment of a second Javan rhino population. Plans for establishing a temporary holding and assessment facility in or near Ujung Kulon National Park have been outlined. From this facility, a breeding population can then be transferred to a second habitat. Details and implementation of this activity will be worked out and agreed under the auspices of the Rhino Task Force. The Rhino Century Program also recommends the assisted re-population of Sumatran rhinos to the northern reaches of Bukit Barisan Selatan National Park. In the longer-term, Sumatran rhino populations should be re-installed in Kerinci Seblat National Park, using stock from other populations (e.g., Bukit Barisan Selatan National Park) or from other captive breeding

programs (e.g., the Sumatran Rhino Sanctuary in Way Kambas National Park).

Protection and conservation of rhinos can only succeed when communities living in the direct vicinity of protected areas are engaged and feel ownership of the efforts. Therefore, the Rhino Century Program calls for community development activities to be stepped-up in the buffer zones of all Protected Areas holding rhinos. These activities should target people directly impacting forest resources. National Park authorities should act as catalyzing agencies which encourage Government and international donors to put priority towards these buffer zones in their development programs. One of the requirements to secure adequate support and goodwill for conservation is to provide for information and transparency on conservation issues. In light of this, the Rhino Century Program regards active conservation education programs, targeting different audiences, for each of the protected areas as essential to its success.

Because scientific knowledge concerning Javan and Sumatran rhinos is very limited, the Rhino Century Program calls for additional research on both species, especially in foraging and breeding ecology. In order to monitor the conservation impact of the Program, population and range surveys will need to be conducted at regular intervals. The progress and impact of the Program itself will be evaluated at 3-year intervals.

1 INTRODUCTION

1.1 The Context

Indonesia is the fourth most populous country on Earth, yet covers only 1.3 percent of the Earth's land surface. Indonesia harbors 10 percent of all flowering plants, 12 percent of the world's mammals, 16 percent of the world's reptiles and amphibians, 17 percent of all birds and more than one-quarter of all marine and freshwater fish.

This richness can be attributed to the fact that Indonesia spans two major bio-geographical realms, Indo-Malaya and Australia and can be divided into seven distinct bio-geographic regions. The archipelago's 17,000 islands support a wide range and variety of habitats from lowland rain forests and mangroves to savannah grasslands, swamp forests, limestone hills, mountain forests, alpine meadows and snow-topped mountains. These varied habitats support a rich flora and fauna.

These habitats and species are increasingly threatened by human pressures such as logging, mining, shifting agriculture and other changing land uses as Indonesia's economy expands to meet the needs of its increasing population. Lowland forest habitats and wetlands are particularly threatened since these are the areas most accessible for agricultural development.

Recognizing the need to conserve its rich biological resources, the Government of Indonesia (GOI) has made a commitment to protect 10 percent of the land area and eventually 20 million hectares of coastal and marine habitats as conservation areas. *In-situ* conservation of biodiversity in Protected Areas is the first priority. Some critically endangered species, however, also require intensive management and *ex-situ* conservation. Both these components are part of the Government's forward-thinking conservation policy.

The conservation community uses the Indonesian Biodiversity Action Plan developed in 1993as a guideline for setting the conservation priority agenda. This Plan identifies a strategy for action under four main headings: *in situ* conservation in terrestrial and marine parks and reserves; *in situ* conservation outside the protected area network (production forests, wetlands, agricultural lands); *in situ* conservation of coastal and marine resources; and *ex situ* conservation of specific species.

Much loss of biodiversity in Indonesia, as elsewhere, is due to economic policy distortions that encourage short-term gain via rapid exploitation of biological resources rather than looking more long-term towards sustainable use of these resources. Slowing the rate of biodiversity loss will require policy and institutional reform in the main economic sectors (agriculture, industry) as well as institutional strengthening to achieve conservation gains effectively.

The uncertainties associated with governmental decentralization have exacerbated environmental degradation. In 2001, the Minister of Forestry issued a Decree that allowed districts and governors to issue permits for small-scale forest exploitation; this was cancelled in early 2002 because of increased damage to the remaining forest areas.

2004 was a very important year in the struggle to implement conservation initiatives in Indonesia. In March, prior to the change in central government administration, the GOI introduced a government regulation in lieu of law (*Perpu*) that allowed 13 large mining companies to resume their operations in Protected Areas, overruling Act no. 41/1999, which banned mining activities in Protected Areas.

There are, however, encouraging innovations from a few district level governments, contrary to the concerns that a decentralized forests management leads to a degradation of forests. These advances range from the issuances of District Regulations (*Peraturan Daerah Kabupaten*) on designation of selected forests as Protected Areas, despite pressures from the central government to allow mining and logging operations, to allocating sufficient city government (*Pemerintah Kota*) funds for management and law enforcement of protected forests (*Hutan Lindung*). These regional governments have realized the benefits of their natural resources to produce environmental services and to protect source of revenues generated from agricultural sectors.

The active participation and support of local communities, as well as provincial and district governments, will be essential to meet conservation requirements for they are in many cases the *de facto* managers of forest, wetland and marine resources. This Plan calls for greater collaboration between government agencies and local communities and NGOs to work together as partners in biodiversity conservation.

The GOI is signatory to the Convention on Biological Diversity (CBD) and the Convention on Trade in Endangered Species of Fauna and Flora (CITES).

The Rhino Century Program Strategy and Action Plan is based on and updates the Indonesian Rhino Conservation Strategy of 1993 (PHKA. 1993. Indonesian Rhino Conservation Strategy. Jakarta. Indonesia) as well as the IUCN-Asian Rhino Specialist Group's 1997 Asian Rhino Conservation Strategy (IUCN/SSC Asian Rhino Specialist Group. 1997. Asian Rhinos. Status Survey and Conservation Action Plan. IUCN. UK). It outlines long-term targets and identifies immediate and attainable priorities for conservation action.

The Rhino Century Program was developed through a consultative process in which Protected Areas holding rhinos, the central Government's Ministry of Forestry, academic institutions, and all major international NGOs active in rhino conservation participated. The outline of this Program was developed during a workshop held in Jakarta on 28-29 February 2006 in which representatives of the above organizations participated. One of the outcomes of the workshop was to develop a Rhino Task Force which oversees, catalyses, and documents the implementation of this Program. The Rhino Task Force is housed in the Directorate General of Forest Protection and Nature Conservation (PHKA) in the Ministry of Forestry and consists of representatives of the Government and the NGO community.

The Rhino Century Program was recognized and endorsed by the GOI. It was launched officially, together with the Rhino Task Force, on 5 November 2007 by the President of the Republic of Indonesia during his speech for the *Hari Cinta Puspa dan Satwa* (National Plant and Animal Day).

1.2 Rhino Task Force

The Rhino Century Program is the Republic of Indonesia's official vehicle to deliver conservation benefits to the nation's rhinos. It is an ambitious strategy and action plan in which Government and national and international non-governmental organizations work together. The Rhino Century Program will continue until the end of this century. It is hoped that by that time, both rhino species in Indonesia will live in healthy, viable populations whose survival is secure.

In order to coordinate and oversee the implementation of the different components of the strategy and action plan by the different partners who participate in the Rhino Century Program, an official Rhino Task Force was established within the *Direktorat Jenderal Perlindungan Hutan dan Konservasi Alam* (PHKA, Directorate General of Forest Protection and Nature Conservation) of the Ministry of Forestry. Their member include representatives of different Governmental agencies and NGOs and is chaired by the Director of Biodiversity Conservation of PHKA. The Rhino Task Force also operates an Indonesian Rhino Information System (IRIS) in which all plans and reports on rhino are captured digitally and in hard copy format. The membership, Terms of Reference and decision-making protocols of the Rhino Task Force are attached as Annex 1.

Detailed activities of the Rhino Task Force are presented in Table 1 on the following pages.

Table 1: Rhino Task Force Action Priorities

No.	Main Results / Outputs (2007 – 2017)	Done by Year	Main Responsibility	Estimated Minimal Budget (in USD)
11.1	An *ad interim* leader appointed who sets up a Rhino Task Force (membership, Terms of Reference (TOR), arrangements with MoF, decision-making procedures, etc).	2007	Effendy Sumardja	No specific budget required
11.2	A Rhino Task Force (with members, TOR, office in MoF) installed to oversee and support implementation of Rhino Century Program strategy.	2008	Effendy Sumardja	No specific budget required
11.3	A proposal developed to secure funding for running cost of the Rhino Task Force (office, computer, quarterly meetings, etc) and submitted to potential donors (e.g., IRF, USFWS, WWF)	2008	Rhino Task Force	USD 5,000
11.4	Support obtained from IUCN-SSC and IUCN Secretariat for the Rhino Century Program and ensure official high-level visit to GOI.	2008	Rhino Task Force	USD 7,000
11.5	Launching of the Rhino Century Program strategy and action plan, and the Rhino Task Force by the GOI during the 5 November 2007 *Hari Cinta Puspa dan Satwa* (National Plant and Animal Day) speech of the President of the Republic of Indonesia.	2007	Rhino Task Force	USD 15,000
11.6	A costed business plan and fundraising strategy formulated as a tool to secure financial resources for implementation of the Rhino Century Program strategy and action plan (especially for securing a Javan rhino habitat and translocation of Javan rhinos).	2008	Rhino Task Force commissions, IRF, and WWF	USD 25,000
11.7	The Rhino Task Force meets every 3 months to monitor progress and make decisions on detailed implementation plans for the various components of the Rhino Century Program strategy and action plan.	2007 onwards	Rhino Task Force	USD 10,000 / quarter
11.8	The Rhino Century Program strategy and action plan is explained and promoted at the National Government level and in communities surrounding National Parks holding rhinos as well as within the donor community through presentations, production and distribution of a	2008	Rhino Task Force, NPs, WWF, IRF	USD 100,000

	brochure, face-to-face meetings, etc.			
11.9	Central Indonesian Rhino Information System (IRIS) set up in MoF in which all documentation on rhino conservation activities (patrols, studies, etc) by NGOs and Government is collected and stored digitally and in hard copy format.	2008 onwards	Rhino Task Force to insist on submission of all reports	USD 5,000
11.10	Information on rhino conservation status, strategic plans and field activities is exchanged internationally through websites, workshops and attendance to conferences.	2008 onwards	AsRSG, Rhino Task Force	USD 35,000 / year
11.11	The Rhino Century Program strategy and action plan is evaluated to measure achievements and parties' commitment, and to guide the implementation of the Proyek Abad Badak strategy further.	2009	Rhino Task Force commissions an evaluation team	USD 40,000

1.3 Indonesia's Rhinoceros Species

Being megavertebrates, and because of their dominant role in the ecosystems where they occur, rhinos are keystone"[1] species. Their conservation will help to protect habitats ranging from lowlands to mountain areas which benefit many other wildlife species as well. Rhinos are often touted as "flagship"[2] species for Protected Areas in which they occur and to attract attention for conservation from the general public. The Javan Rhino is of particular importance, as only one small population survives in Ujung Kulon National Park.

The sole Javan rhinoceros population in Indonesia is classified as *Rhinoceros sondaicus sondaicus*[3]*.* Sumatran rhinoceros are of the subspecies *Dicerorhinus sumatrensis sumatrensis* found on the island of Sumatra and *D. s. harrissoni* on Kalimantan. These two species are the rarest of the world's five rhino species and among the most threatened mammals in the world. Fewer than 300 Sumatran rhinos survive, distributed over at least 35 localities in Indonesia and Malaysia. Fewer than 60 Javan rhino exist in Ujung Kulon National Park, representing almost the entire world population[4].

The Javan rhino once occurred throughout most of Southeast Asia: Assam-India, Myanmar, Thailand, peninsula Malaysia, Sumatra and western Java (Map 1). The species now is restricted to the western-most tip of Java in Ujung Kulon National Park. A remnant population of about 3 to 7 Javan Rhinos survives in Cat Tien National Park in southern Vietnam. Occasional unconfirmed sightings from Cambodia and Laos suggest that a few scattered animals may still survive there. The current world population of Javan rhinos is estimated to be between 38 and 65 individuals (Figure 1) and has been relatively static for several decades. The cause of decline is mainly attributable to habitat loss. In the past, their numbers were severely reduced by excessive hunting to obtain rhino horns and other rhino products for traditional Asian medicine. Javan rhinos appear to reproduce slowly, take a relatively long time to mature, and once populations decrease, it takes a lot of time for populations to expand again.

The Sumatran rhino occurred throughout Assam–India, Myanmar, peninsula Malaysia, Sumatra and most of the island of Kalimantan (Map 2), while isolated populations existed in Vietnam, Laos and Cambodia. Their range has been severely restricted as well, with isolated populations now only surviving in peninsula Malaysia, Sumatra and Sabah–Kalimantan. Unconfirmed sightings of rhino in Myanmar and Laos (presumably

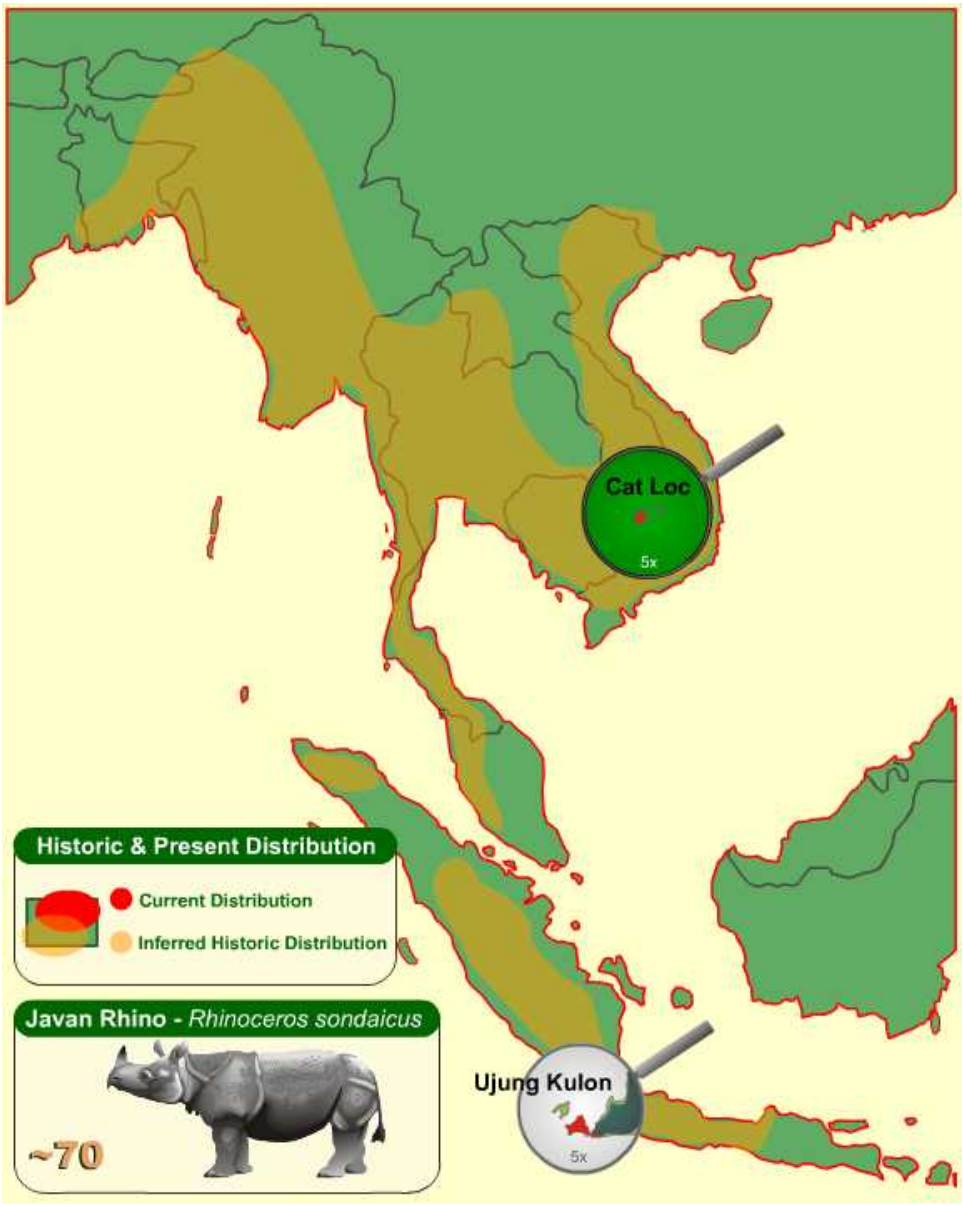
[1] A keystone species is a species whose very presence contributes to a diversity of life and whose extinction would consequently lead to the extinction of other life forms. Keystone species help to support the ecosystem (entire community of life) of which they are a part.

[2] A flagship species is a species chosen to represent an environmental cause, such as an ecosystem in need of conservation. These species are chosen for their vulnerability, attractiveness or distinctiveness in order to best engender support and acknowledgement from the public at large. Thus, the concept of a flagship species holds that by giving publicity to a few key species, the support given to those species will successfully leverage conservation of entire ecosystems and all species contained therein.

[3] A second sub-species *Rhinoceros sondaicus annamiticus* survives in very small numbers (probably only 3 – 7) in Cat Tien National Park – Vietnam, which is the only other group of Javan Rhinoceros known to exists (Polet *et al*., 1999).

Sumatran rhinos) continue to be reported. In 1993 the world population was estimated to be around 950 individuals; the current world population is now estimated to be less than 300 animals in a handful of populations (Figure 2). Habitat loss is now probably the most important threat to the Sumatran rhinos. Until recently, the species was hunted intensively for their horn and even now, animals are occasionally lost due to poaching. Like Javan rhinos, Sumatran rhinos also appear to reproduce slowly and take a long time to mature. Once population numbers began a downward spiral, it takes a lot of time for them to expand again.

Map 1: Historical and Present Distribution of Javan Rhinoceros



Map 2: Historical and Present Distribution of Sumatran Rhinoceros

Figure 1: Global Javan Rhinoceros Population Estimates (2006)

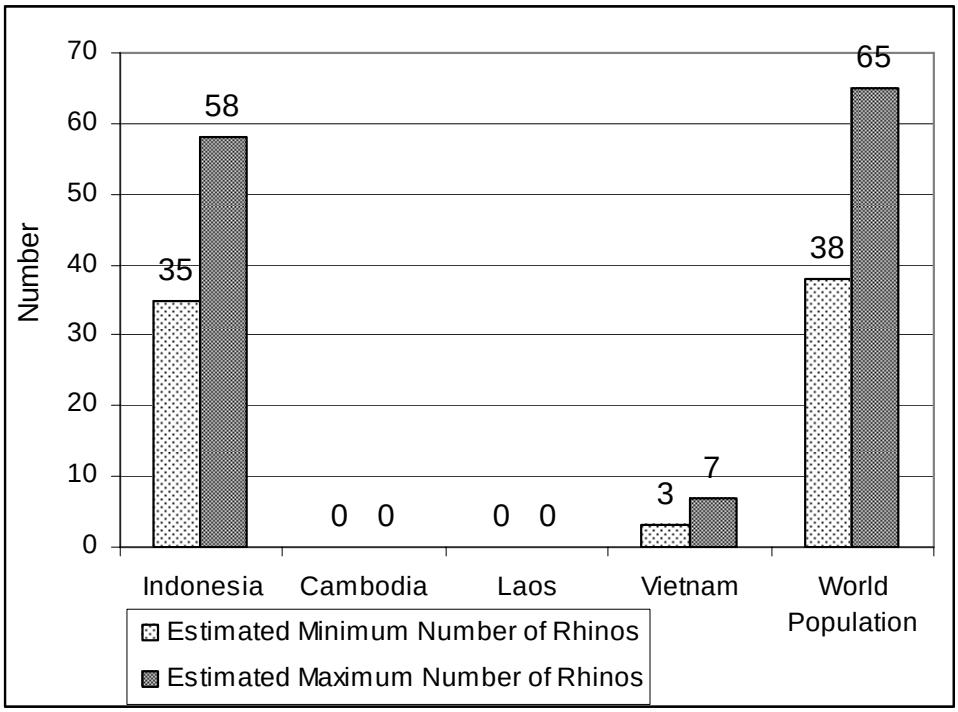
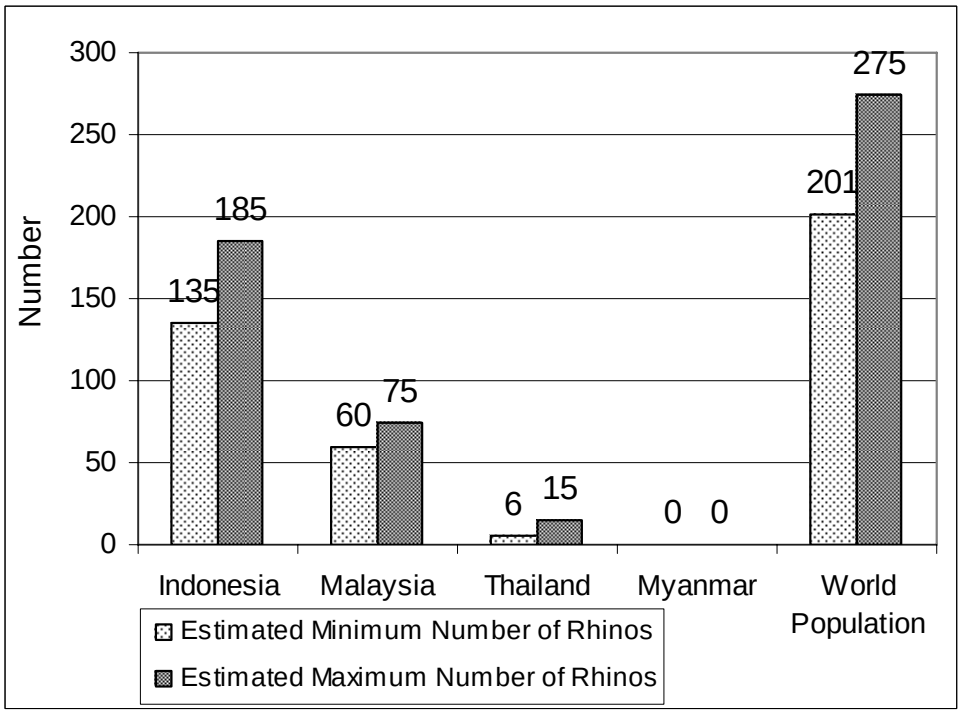


Figure 2: Global Sumatran Rhinoceros Population Estimates (2006)



Unless drastic steps are taken and specific actions are carried out to restore and safeguard rhino populations to adequate levels, the disappearance of more and more of the remaining populations and eventually the extinction of both species is inevitable.

Indonesia harbors virtually the whole remaining world population of the Javan rhino in Ujung Kulon National Park, and the largest remaining populations of Sumatran rhino in Gunung Leuser, Bukit Barisan Selatan and Way Kambas National Parks in Sumatra - about 70 percent of the total world population. Therefore the GOI has a pressing responsibility to its people as well as to the world for the long-term survival of these two unique species.

1.4 Threats and Human Pressures

All five rhino species are included in IUCN's Red List of Threatened Species (www.iucnredlist.org). Javan, Sumatran, and Black rhinos are considered Critically Endangered; Indian or Greater one-horned rhinos are listed as Endangered, and White rhinos as Near-Threatened. There are fewer than 18,000 rhino left on the planet. More than two-thirds of these (~11,330) are white rhinos *Ceratotherium simum* .. Despite successes in bringing whites and Indian rhinoceros back from numbers as low as 20-200 in the early 1900's, all five species still face a global conservation crisis without continued and effective interventions. .

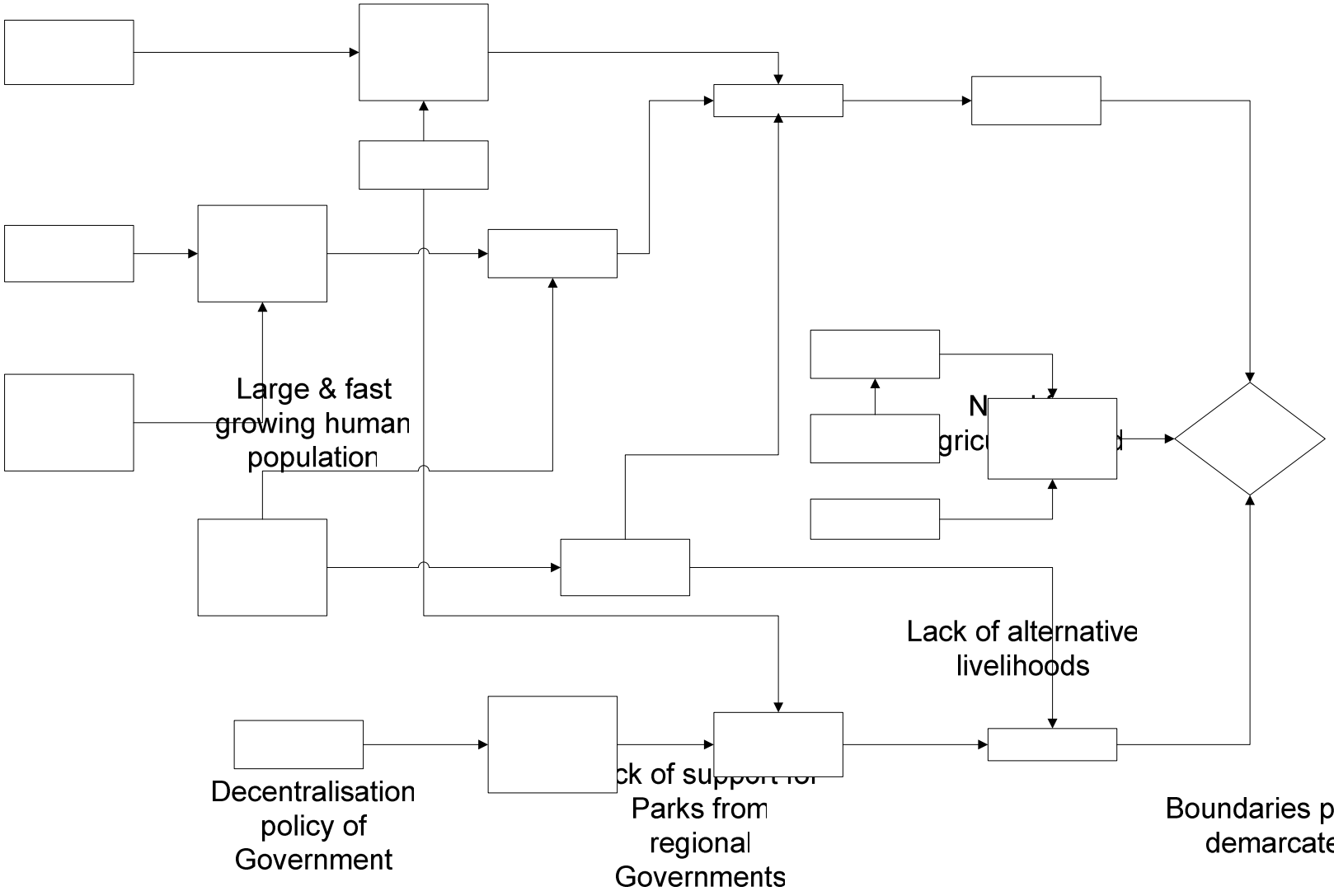
In Asia, the Sumatran and Javan rhinoceros are the most severely threatened. Increasing population numbers as happened with white and Indian rhinos will prove to be an enormous challenge. Javan and Sumatran rhinos are secretive, solitary forest-dwelling and browsing animals living in very low densities, unlike the white and Indian rhinos which live in high densities in savannah environments where they eat grass.

Figure 3 provides a generic overview of the threats from human pressures on rhinos in the Indonesia. All populations suffer from habitat loss and habitat fragmentation due to human encroachment into areas in which rhinos live. While Javan rhinos appear to now be contained within a secure habitat, poaching remains a potential threat. With the Ujung Kulon population being the single population remaining in the world, the species could be devastated by catastrophic events such as a disease outbreak, tsunami, or other natural disaster. Sumatran rhinos have been the victims of poaching more recently than Javan rhinos. The last reported poaching incidents were in 2001 and 2002 in Bukit Barisan Selatan National Park, and appear to have been isolated incidents. Protection capacities of National Park authorities have been strengthened through the support of NGOs such as International Rhino Foundation (IRF) and the Worldwide Fund for Nature (WWF.) The deployment of specially-trained Rhino Protection Units has helped to curb poaching more than any other single activity.

Although relatively secure, the Javan rhino population is languishing, if not already facing a slow decrease. Limitations in food availability resulting in limited breeding success are often cited as possible causes. Ujung Kulon National Park may have reached its carrying capacity for Javan rhinos. Very little is known about both the breeding and foraging ecology of both Javan and Sumatra rhinos. Even without any further losses, the present populations are so small that they are vulnerable to natural catastrophes and inherent demographic and genetic stochasticities typical of small

populations.

Figure 3: Overview of some of the most important human pressures experienced by Javan and Sumatran rhino populations in Indonesia.



1.5 Stakeholders

With almost all rhinos now surviving only in National Parks, the PHKA, which controls National Parks, has the primary responsibility for conservation management of Indonesia's rhinos. . Substantial numbers of law enforcement and technical personnel are fielded in each protected area by PHKA and the Government is financing all regular running costs of Protected Area. Special projects such as the annual Javan rhino census are also financed and implemented by the Government.

Since 2000, the GOI has decentralized much of the responsibility for the management of natural resources to Provinces and Districts. Most of the Provinces' and District's policies are driven by direct and immediate economic growth objectives and only limited consideration is given to conservation needs. In several cases, the authority of the central Government in protected areas has been challenged by Provinces and Districts, resulting in substantive increases in encroachment into protected areas by humans and subsequent conversion of substantive tracts of protected forest into small holder agricultural land, oil palm estates and pulp wood estates. This situation has proven to be disastrous for conservation in general, and for rhino conservation in particular. This lack of control has resulted in a substantial increase in poaching, especially targeting high-economic value species such as Sumatran rhino, Sumatran tiger and Asian elephant. For example, in the last 10 years, Kerinci Seblat National Park's rhinos, estimated to number 80 to 100 in 1993 (Soemarna *et al,* 1993), have almost all been lost. Asian elephants and Sumatran tigers are also being killed or captured in response to conflicts with humans.

In an effort to work in partnership to assist the Government in its tasks to ensure the survival of rhinos in Indonesia, several national and international NGOs are active in rhino conservation.

The International Rhino Foundation (IRF) concentrates on strict law enforcement and rhino monitoring by financially and technically supporting Rhino Protection Units (RPUs) in Ujung Kulon, Way Kambas, Bukit Barisan Selatan and Kerinci Seblat National Parks. The IRF receives funding from private individuals, US-based zoological institutions, and also has received substantial support from donors such as the Critical Ecosystem Partnership Fund, the Global Environment Facility, the USFWS and the Asian Rhino Project (Australia).

The World Wide Fund for Nature (WWF), through its global Asian Rhino and Elephant Action Strategy (AREAS) operates field projects in Ujung Kulon and Bukit Barisan Selatan National Parks. These projects conduct rhino monitoring work using camera traps, conservation awareness raising activities and several income generating activities for people living in the park's buffer zones. WWF receives its funding from public memberships and from institutional donors such as the USFWS.

The Wildlife Conservation Society (WCS) operates a field research station in Bukit Barisan Selatan National Park. Although WCS does not study rhinos in particular, it has been able to collect numerous pictures of Sumatran rhinos using camera traps. Work under this program concentrates on addressing conservation needs in the Park's buffer zones through community development and conservation awareness raising activities.

The Leuser International Foundation (LIF), formerly the Leuser Development Program, sprang from a very large European Union-funded project. This foundation concerns itself with the wider Leuser ecosystem but operates special rhino patrol units to increase rhino protection.

Flora and Fauna International (FFI) operate a small project in Kerinci Seblat National Park. One of its activities has been to monitor wildlife using camera traps and the presence of a wide range of mammals has been documented.

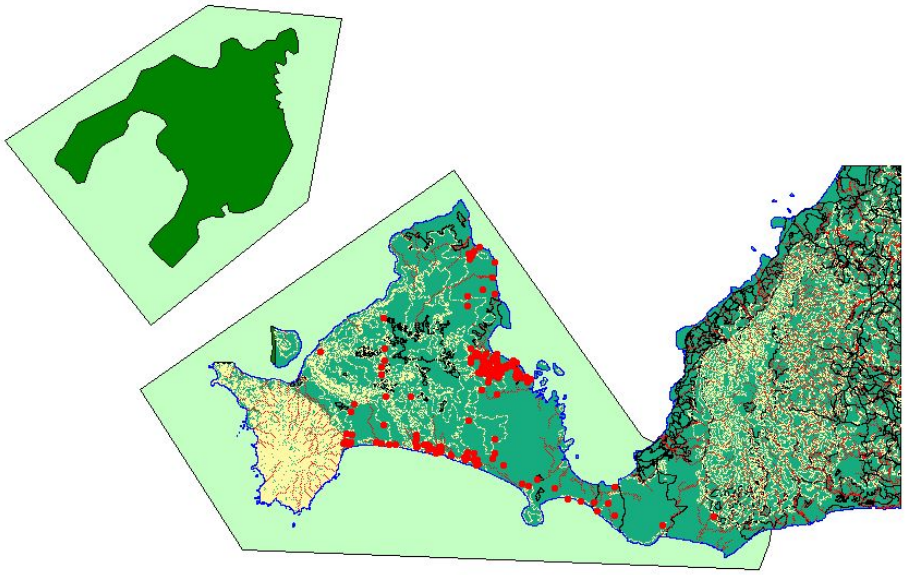
Almost all international NGOs work in close partnership with or through national NGOs. The most important ones in the field of rhino conservation are *Program Konservasi Badak Indonesia* (PKBI), which is IRF's main partner. Yayasan Mitra Rhino (YMR), with the help of the Sumatran Rhino Global Management and Propagation Board (GMPB), is mainly concerned with the management of captive Sumatran rhinos in Way Kambas National Park but is also conducting research activities such as Javan banteng – Javan Rhino interactions. PKBI and YMR have recently merged into one foundation, *Yayasan Badak Indonesia* or YABI (Rhino Foundation of Indonesia).

Several international donors have funded rhino conservation work. These include the CEPF, the USFWS - RCTF, and the UNDP-Global Environmental Facility. Some of the larger institutional donors, such as the European Union, mentioned above, fund larger projects with a wider scope than just rhinos but their activities catalyze important conservation benefits for rhinos as well. Several embassies have funded smaller projects such as New Zealand's involvement in education and ecotourism activities in Ujung Kulon National Park.

Ujung Kulon National Park is recognized as a World Heritage site under the United Nations UNESCO. Under this framework, UNESCO has been assisting with awareness activities.

2 CONSERVATION STATUS OF JAVAN RHINOCEROS

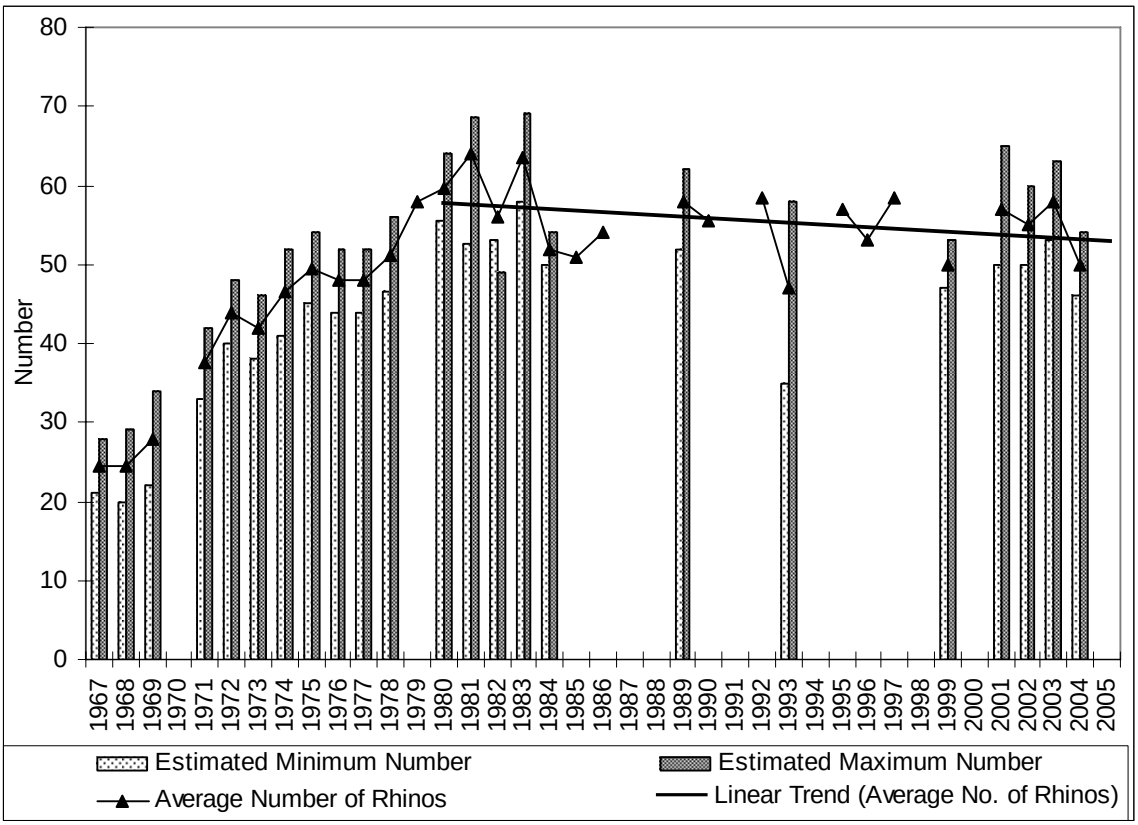
Map 3: Ujung Kulon National Park with current Javan Rhinoceros distribution.



2.1 Numbers and Trends

From the mid 1960s and the early 1980s, Javan rhino numbers slowly grew from an extremely small number of about 25 animals to about 60 animals. It appears that since the early 1990s a slightly negative trend has set in, with current rhino numbers estimated to be around 50 (Figure 4). If the current trend continues (a growth rate of -0.7% / year), the Javan rhino population in Indonesia will halve before the end of the century.

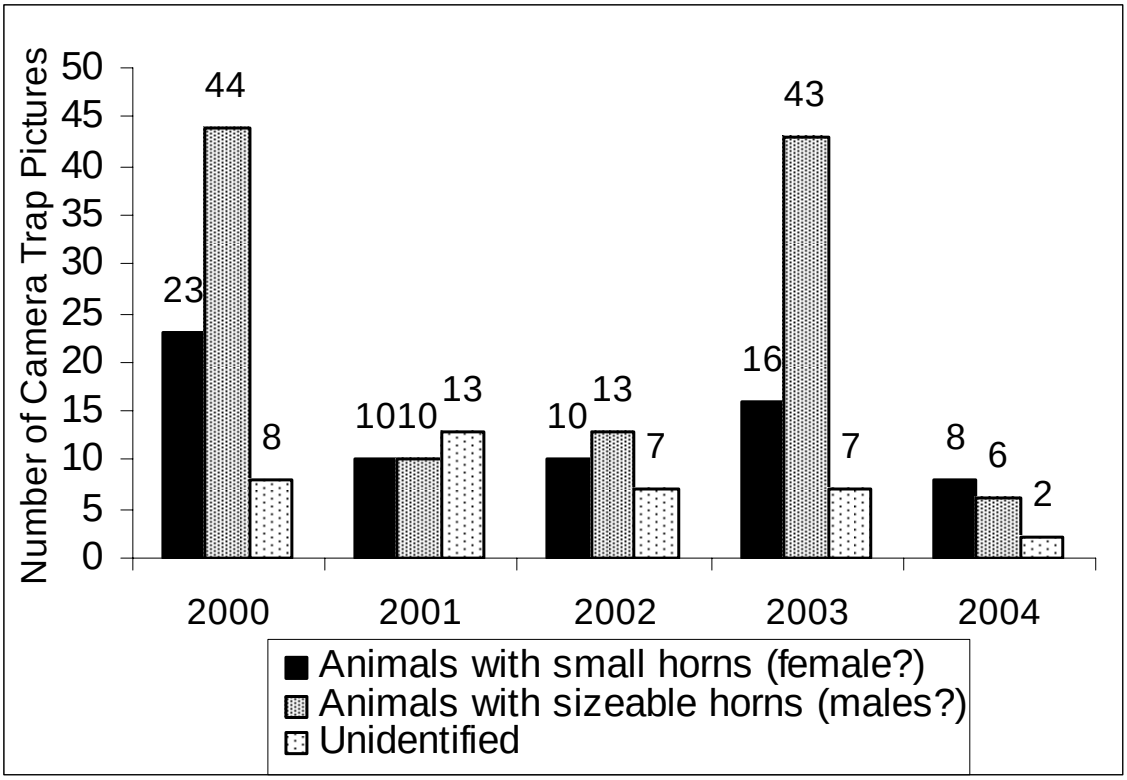
Figure 4: Population Trends of Javan Rhinoceros



Data mostly from censuses conducted by Ujung Kulon National Park using footprint size measurements.

An analysis of 220 camera trap photos taken by WWF from 2000–2004 reveals that in most years, about the same number of animals with and without sizeable horn were photographed. However, in 2000 and 2003, a substantially larger number of animals were photographed carry sizeable horns. It has been suggested (Griffith, 1993) that only males carry sizeable horns, although Schenkel and Schenkel (1969) did not find a correlation between sex and horn size. The sex composition of the Ujung Kulon rhino population remains unclear; there is no verification of the suggestion that there is an over-abundance of males.

Figure 5: Horn sizes of Javan Rhinos on Camera trap Pictures

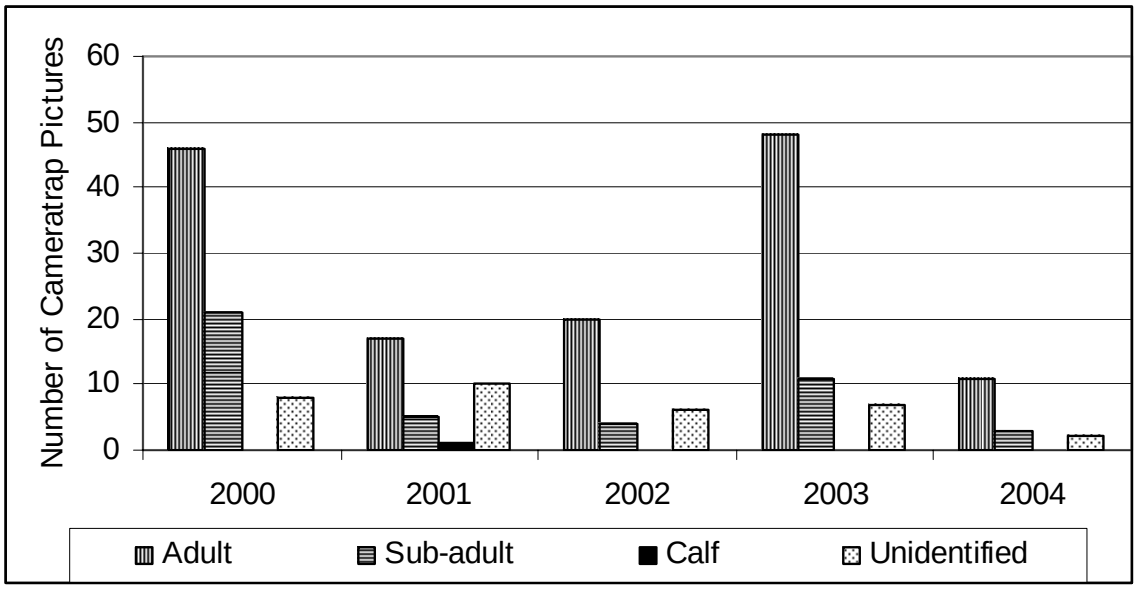


Data based on camera trap photos taken by WWF in 2000 - 2004; N = 220

Using the same photographs, an attempt was made to identify age classes of the animals (Figure 6). In the pictures collected between 2000 and 2004, 65% were of adult animals, 20% were of sub-adult animals and for 15% of the animals, age class could not be determined. While these data are inconclusive (the same animal might appear on several pictures while other animals might not have been photographed), it appears that there are no immediately apparent imbalances in the age structure of the population.

Pictures of a calf were collected only in 2002. Thereafter, small footprints have occasionally been encountered by the RPUs and the WWF camera trap team. This lack of evidence of reproduction is cause for concern. It may be that reproductive behavior is diminishing due to limitations in available habitat.

Figure 6: Age Classes of Javan Rhinos on Camera trap Pictures



Data based on automatic camera trap photos taken by WWF in 2000 - 2004; N = 220

It has been suggested that Ujung Kulon National Park may have reached its carrying capacity for Javan rhinos. In the next section, possible factors limiting growth are discussed. These and others have been debated at some length and over a protracted period of time (see Indonesian Rhino Conservation Strategy, 1993). Some additional research has been undertaken but data remain inconclusive. Meanwhile, the rhino population is believed to be languishing. More intensive management measures are required to prevent the Javan rhino population from a slow but steady decline towards extinction. To address this, establishing a second population is regarded as a high priority need; albeit somewhat risky (see Section 3.2).

2.2 Distribution and Vulnerability

Javan rhinos are found only in Indonesia's Ujung Kulon National Park (122.956 ha of which ~40,000 ha is used by rhinos; Map 3). The rhino range is on the peninsula which is at most 10 meters above sea level and located about 50 km from the Anak Krakatau volcanic island. This volcano still is active; in 1880 a massive eruption swept the parent volcano away and triggered a massive tsunami. This population is at risk in terms of any number of catastrophic events, including disease, volcanic activity, and resultant tsunamis. This, combined with its small population size and single-site distribution, makes the Javan rhino population in Indonesia extremely vulnerable to the risk of extinction.

2.3 Security

The area now known as Ujung Kulon National Park has a long history of protection, beginning with its declaration as a Hunting Reserve in 1910. In 1921, its status was upgraded into a Nature Reserve. In 1980, it was declared as one of Indonesia's first five National Parks. In 1992, the Park, along with the Krakatau archipelago was declared

Indonesia's first World Heritage Site.

The Park now is staffed by about 120 people, of whom 80 are rangers. The Park operates 19 guard stations – nine of these are located within the rhino's habitat. With the assistance of IRF through PKBI, three RPUs (20 staff) regularly patrol the rhino range. These units are well- trained and well-equipped and consist of regular Park rangers and trained guards from local communities. With the assistance of WWF, the Park operates two marine patrol teams to discourage violators from entering the Park by sea. The presence of an additional WWF camera trap team provides an additional deterrent. Fishermen and bird catchers are however regularly encountered in rhino areas. The rhino range is closed to tourists during the breeding season (June through August).

Staffing appears to be at an adequate level and of adequate capacity to provide for secure rhino habitat on the peninsula. The last rhino poaching incident was reported in the early 1970s.

The Gunung Honje section of the Park (on the mainland) is less secure, with encroachment by local people taking place. This area is only occasionally used by rhinos.

2.4 Ecological Interactions

Ujung Kulon National Park is home to an estimated 800 Javan banteng (*Bos javanicus)*. Banteng are primarily grazers (but they browse when grass is in short supply) and their feeding ecology overlaps only a little with Javan rhinos (also browsers). Nevertheless, if banteng numbers are very large as is the case in Ujung Kulon, a negative impact on availability of foraging plants for rhinos is a possibility. For rhino conservation, it may be useful over the short-term to maintain and expand open grazing areas for banteng within the Park so that competition for food with rhinos is reduced. It should be realized, however, that this measure does not permanently solve the foraging competition problem because making more feeding grounds available to banteng could lead to a growing banteng population. Rhinos reproduce more slowly than banteng, and thus could be outnumbered by banteng, despite their possible initial increase in numbers. Even though rhinos could benefit from the improved availability of food plants if banteng concentrated on grazing only, grasslands can not be expanded indefinitely within the static-sized Protected Area. A number of other promising options need to be evaluated, including the possible translocation of Ujung Kulon's banteng to other suitable Protected Areas.

One issue related to the availability of food plants is the Arenga palm (*Arenga obtusifolia)*. Where Arenga palm dominates, nothing else grows. A vegetation map from 1983 indicates a large number of forest blocks that included stands of the palm. Currently an estimated 60% (18,000 ha) of the peninsular section of the Park is covered with Arenga palm and precludes the growth of suitable rhino food. In order to increase rhino food plant availability, it is therefore recommended to conduct eradication trials of Arenga palm on a medium-sized scale to monitor rhino food plant development in these treated areas. Over the last several years, WWF has experimented with different techniques on a very small area. Eradication with an herbicide such as RoundUp is fairly simple; this kills the palms while leaving no measurable chemical traces behind in the soil.

3 CONSERVATION STRATEGY FOR JAVAN RHINOCEROS

3.1 Targets

The principles of conservation biology and especially the process of Population and Habitat Viability Analyses (PHVA) on all five rhino species provide guidelines for the minimum numbers and distribution of rhino to ensure genetic variability (for fitness and adaptability) and demographic security. These guidelines argue for global populations of 2,000 to 3,000 of each species distributed over at least five separate protected areas, each of which should be capable of accommodating a minimum of 100 rhino, preferably more. It is highly desirable to have two or more protected areas with populations of 400-500 rhino each.

The long-term target for Javan rhino conservation in Indonesia is therefore to have 1,000 animals in one population of 400–500 animals, two to three populations of at least 100 animals and two to three populations of less than 100 animals.

Based on a potential annual growth rate of 3%[4], the immediate targets for the number of Javan rhinos are as follows:

Until 2007	Stable population of 50 – 60	Ujung Kulon National Park (one site)
By 2015	70 – 80	As above + one additional site (two sites + one sanctuary[5])
By 2025	100 – 120	As above (two sites + one sanctuary)
By 2035	140 – 190	As above + one additional site (three sites + one sanctuary)
By 2045	200 – 290	As above (three sites + one sanctuary)
By 2055	280 – 450	As above + one additional site (four sites + two sanctuaries)
By 2065	390 – 700	As above + one additional site (five sites + two sanctuaries)
By 2075	550 – 1,100	As above + one additional site (six sites + two sanctuaries)

3.2 Goal and Objectives

The ultimate goal of the Rhino Century Program strategy and action plan is *to create conditions conducive to and then to actually develop viable populations of Javan rhinos in the wild.*

In the short term (2007–2012) the following objectives will be pursued to contribute towards fulfilling the long-term goal:

[4] The Javan rhino population of Ujung Kulon NP grew at about 7% / year in the period 1967 – 1981 (25 to 63 animals). The White Rhinoceros population in South Africa has grown at about 6% after recovering from about 50 animals in 1900 to 1,700 in 2000. Similarly, the Indian rhino population grew at about 6% / year when recovering from about 100 animals in the early 1900's to about 3,000 nowadays.

[5] *Sanctuary* in the context of this document means a very large enclosed area of natural habitat that may serve multiple functions for rhino conservation, including (1) a transition and assessment area for rhinos that are to be translocated; (2) a study area to expand knowledge of the ecology and behaviour of these still little known species, and/or (3) to produce offspring in a secure and managed situation for eventual release into the wild.

1. Maintain and than expand by 20% the wild population in Ujung Kulon National Park.
2. Establish one additional wild population elsewhere through translocations after identifying and securing adequate (> 400,000 ha) additional habitat.
3. Establish one Javan rhino sanctuary to back up the *in-situ* conservation program.

3.2.1 Maintain and then expand by 20% the wild population in Ujung Kulon National Park.

The highest priority of the Rhino Century Program is to maintain the population of Javan rhinos in Ujung Kulon National Park. By providing security and other means specified in the Action Plan below, the number of rhinos in Ujung Kulon mustfirst be maintained at current levels. Additional habitat in the Park has been earmarked to be secured and active management is to be undertaken (primarily through diminishing areas with Arenga Palm and suppressing the number of banteng). In this manner it may be possible to achieve a small increase in numbers inside Ujung Kulon to a total of about 70 animals. But, a further increase inside the Park is unlikely to be possible as its carrying capacity for rhinos is already nearly saturated. Expansion of the population beyond the boundaries of Ujung Kulon NP is not possible as the neighboring areas are completely occupied by humans.

3.2.2 Establish one additional wild population elsewhere through translocations after identifying and securing adequate,suitable (> 400,000 ha) additional habitat.

The entire populations of Javan rhinos live in an isolated protected area, surrounded by areas heavily used by humans. The only way to expand the number of Javan rhinos significantly is through translocations and reintroductions to secure habitats within the historic range of the species (i.e., the islands of Java and Sumatra).

Translocation and reintroduction has to be very carefully planned to maximize the chance of success, because, aside from the considerable costs involved, it is not without risks for the animals involved and will always entail a loss of animals from the source population. In principle, only animals that are in a hopeless situation and cannot be conserved in the wild, or animals from healthy and safe populations that are able to sustain the loss of a number of animals, should be used for reintroduction programs. With an estimated population of 50 to 60 animals in Ujung Kulon, the number of animals that can be used for a reintroduction program is very small indeed. However, not attempting to establish a second population while the Ujung Kulon National Park population continues to decline will surely result in the extinction[6] of the species. It can not be stressed enough that the conservation status of Javan rhinoceros is very desperate and that drastic steps, and concomitant risks, need to be taken if the species is to survive. Therefore, the Rhino Century Program proposes the capture of a number animals and placement in a temporary holding facility in or near Ujung Kulon National Park. There, their reproductive capacity will be assessed and their feeding and breeding behavior studied. After animals suitable for a translocation have been identified, the

[6] The species will be extinct locally in Indonesia and probably globally as well because it is doubtful that the only other known population of maximum 5-7 animals in Cat Tien National Park will survive.

animals will be transferred to a new site with adequate and secure habitat.

Especially on the island of Sumatra, there is adequate suitable habitat available within existing Protected Areas. However, secure habitat is in short supply. The Rhino Century Program proposes a stepwise process to identify an ecologically suitable second Javan population site and to provide the necessary security for such a site.

3.2.3 Establishment of one Javan rhino sanctuary as insurance for the *in-situ* conservation program

Due to very small number of population (~60 rhinos), and other risks described earlier in this document, the extinction of the wild Javan rhino population is highly possible. It is important that any species facing such a precarious future be 'insured', and an *ex-situ* program provides such an insurance policy. Therefore, the Rhino Century Program recommends establishing a backup *ex-situ* (captive) population of Javan rhinos. Since the Javan rhino has been geographically and demographically isolated for a long time in Ujung Kulon National Park, the sanctuary should be established where the rhinos can still live in a natural habitat while and be under intensive management in order to maintain the species' existence.

4 CONSERVATION ACTION PLAN FOR JAVAN RHINOCEROS (2007–2017)

The Conservation Action Plan for Javan Rhinoceros presents more detailed results (or outputs) to be achieved in the period 2007 to 2017. These contribute towards the achievement of the targets, goal and objectives defined in the Strategy above. The different results are grouped as follows: protection of Javan rhinos, habitat management, population management, co-existence of Javan rhinos with humans (community development generating Javan rhino conservation benefits and awareness-raising) and research. These are outlined below. A summary table of the Javan rhino strategy and action plan, defining the principal partners and estimated minimal budget requirements, can be found in Table 2 on the following pages.

Table 2: Strategy and Action Plan Outline for the Conservation of Javan Rhinoceros *Rhinoceros sondaicus* (2007 – 2017)

<table>
<tr><th colspan="2">STRATEGY for CONSERVATION of JAVAN RHINOCEROS Rhinoceros sondaicus</th></tr>
<tr><td>Current World Population</td><td>46 – 54</td></tr>
<tr><td>Current population in Indonesia</td><td>46 – 54[7] (Ujung Kulon National Park)</td></tr>
<tr><td>Historic % in Indonesia</td><td>50% (currently 100%)</td></tr>
<tr><td>IUCN-AsRSG global target</td><td>2,000 – 3,000 animals globally for the species, including at least two populations of at least 400 – 500 animals + at least five populations of at least 100 animals</td></tr>
<tr><td>Habitat available</td><td>40,000 ha (Ujung Kulon National Park)</td></tr>
<tr><td>Main conservation issue</td><td>Small and stagnating / declining Javan rhino population in Ujung Kulon National Park, which is small and of finite size.</td></tr>
<tr><td>Targets for Indonesia (based on 3%[8] annual growth rate)</td><td>
<table>
<tr><th>Targets</th><th>Total Population</th><th>400 – 500 populations</th><th>100+ populations</th><th><100 populations</th></tr>
<tr><td>Javan rhino</td><td>1,000</td><td>1</td><td>2 - 3</td><td>2 – 3</td></tr>
</table>
<table>
<tr><th>Time</th><th>Targets</th><th>Locations</th></tr>
<tr><td>Until 2007</td><td>Stable population of 50 - 60</td><td>Ujung Kulon National Park (one site)</td></tr>
<tr><td>By 2015</td><td>70 – 80</td><td>As above + one additional site (two sites + one sanctuary)</td></tr>
<tr><td>By 2025</td><td>100 – 120</td><td>As above (two sites + one sanctuary)</td></tr>
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<tr><td>By 2065</td><td>390 – 700</td><td>As above + one additional site (five sites + two</td></tr>
</table>
</td></tr>
</table>

[7] 2004 census data from Ujung Kulon National Park
[8] White Rhinoceros' population in South Africa has grown at about 6% after recovering from about 50 animals in 1900 to 1,700 in 2000.

			sanctuaries)
	By 2075	550 – 1,100	As above + one additional site (six sites + two sanctuaries)
Additional habitat required	400,000 ha for one large population to be identified and secured starting immediately.		
	Total of 1,100,000 ha to be earmarked and secured by 2055 (also outside Indonesia within historical range for the other 1,000–2,000 Javan rhinos in the global population).		
Goal (long-term)	Create conditions conducive to and then to actually develop viable populations of Javan rhinos in the wild.		
Objectives (10 years)	Maintain and then expand by 20% the wild population in Ujung Kulon National Park.		
	Establish one additional wild population elsewhere through translocations after identifying and securing adequate (> 400,000 ha) additional habitat.		
	Establish an *ex-situ* population of Javan rhinos under sanctuary conditions as an insurance population.		

ACTION PLAN for CONSERVATION of JAVAN RHINOCEROS *Rhinoceros sondaicus*				
No.	**Main Results / Outputs Javan Rhinoceros Conservation (2007 – 2017)**	**Done by Year**	**Main Responsibility**	**Estimated Minimal Budget (in USD)**
1.	**PROTECTION**			
1.1	Rhino patrols have been improved by covering areas outside the standard patrol routes.	2007 onwards	UKNP, YABI (RPUs)	No additional budget required
1.2	Protection in the Air Mokla – Reuma Jengkol area (7-10,000 ha) has been stepped-up (e.g. regular patrols) to halt encroachment and disturbance so that area is secure for use by rhinos again.	2007 onwards	UKNP	No additional budget required
1.3	Three RPUs remain in place, equipped and trained throughout the implementation period of this Strategy and Action Plan in order to provide security to the rhino population in Ujung Kulon National Park .	Ongoing	UKNP, YABI, IRF	USD 35,000 / RPU = USD 105,000 / year
1.4	One additional RPU established.	2009 onwards	UKNP, YABI, IRF	USD 35,000 / year

ACTION PLAN for CONSERVATION of JAVAN RHINOCEROS *Rhinoceros sondaicus*				
No.	**Main Results / Outputs Javan Rhinoceros Conservation (2007 – 2017)**	**Done by Year**	**Main Responsibility**	**Estimated Minimal Budget (in USD)**
1.5	Two existing Marine Patrol Units remain in place and equipped to deter entrance to Park from sea after which its effectiveness is being evaluated.	Ongoing	UKNP, WWF	USD 45,000 / MPU
1.6	Documentation improved and available of area coverage and violations encountered by RPUs and forest guards in bi-monthly technical reports measuring patrol effort and effectiveness and with maps of patrol routes taken.	2007 onwards	YABI, UKNP	Built-in RPU budgets
2.	**HABITAT MANAGEMENT**			
2.1	A proposal prepared and submitted to the Ministry of Forestry in order to get an immediate exemption (and/or re-zoning of the Park if needed) which provides the legal basis for the eradication of Arenga Palm.	2008	UKNP, Scientific Community (Hadi S. Alikodra)	No additional budget required
2.2	Areas of Arenga Palm in Ujung Kulon National Park mapped.	2008	Institut Pertanian Bogor, YABI, WWF	USD 5,000
2.3	Desk study conducted and a fact sheet produced on use of RoundUp in US zoos and experience from earlier WWF experiment regarding residues.	2008	Institut Pertanian Bogor, YABI, IRF, WWF	No specific budget required
2.4	At least 200 ha of Arenga Palm cleared, preferably manually (but with RoundUp where close to villages) in the Cikarang area as a trail to trigger secondary growth as food supply for Javan rhinos and measure concrete impacts (growth of secondary vegetation and use by rhinos).	2009	Institut Pertanian Bogor, YABI, WWF, UKNP	USD 20,000 & sponsorship from RoundUp producer
2.5	Impact of manual removal and use of RoundUp in combating Arenga Palm studied and documented in terms of re-growth and presence of residual chemicals and decision taken on the safest and most efficient methodology to be used in the future.	2009 Onward	Institut Pertanian Bogor, YABI, WWF	No specific budget required
2.6	At least 4,000 ha of Arenga Palm cleared either manually or by using	2010	UKNP	USD 30,000 /

ACTION PLAN for CONSERVATION of JAVAN RHINOCEROS *Rhinoceros sondaicus*				
No.	**Main Results / Outputs Javan Rhinoceros Conservation (2007 – 2017)**	**Done by Year**	**Main Responsibility**	**Estimated Minimal Budget (in USD)**
	RoundUp.			year
2.7	All grassland areas are maintained as such and are expanded in a mosaic with 200% in order to provide additional grazing for Javan banteng in order to ease possible competition with rhinos over food resources.	2008	UKNP	USD 5,000
2.8	A management plan for Javan banteng formulated, defining the maximum number of banteng to be allowable in Ujung Kulon NP (e.g., number of Banteng at times when rhino number was still growing) and defining options to keep number of banteng under target population size (e.g., through translocation of at least 500 Banteng to Pangandaran NR and / or other protected areas) while still providing appropriate protection as a threatened species	2008	Institut Pertanian Bogor	USD 5,000
2.9	Active management implemented to limit banteng numbers in Ujung Kulon National Park.	2009	UKNP	USD 100,000 if translocation
2.10	Survey on the possibility to extend Javan rhino habitat to Gunung Honje, including approaching [what does this mean?] and determining the suitability of habitat	2009	UNKP, Sultan Ageng Tirtayasa University Institut Pertanian Bogor	
3.	**POPULATION MANAGEMENT**			
3.1	A full listing documented of potential sites on Java and Sumatera for establishing a second Javan rhino population.	2008	Rhino Task Force	No specific budget required
3.2	Criteria for suitability analysis set and an Assessment Team established to evaluate suitability of potential sites for a second Javan rhino population on Java or Sumatra.	2008	Rhino Task Force	No specific budget required
3.3	Tesso Nilo National Park evaluated as a potential site for a second Javan rhino population (desk study and field investigations).	2008	WWF	USD 8,000

ACTION PLAN for CONSERVATION of JAVAN RHINOCEROS *Rhinoceros sondaicus*				
No.	**Main Results / Outputs Javan Rhinoceros Conservation (2007 – 2017)**	**Done by Year**	**Main Responsibility**	**Estimated Minimal Budget (in USD)**
3.4	Berbak National Park evaluated as a potential site for a second Javan rhino population (desk study and field investigations).	2008	WI	USD 8,000
3.5	Gunung Halimun National Park evaluated as a potential site for a second Javan rhino population (desk study and field investigations).	Done	WWF	No additional budget required
3.6	Harapan forest in south Sumatera (Jambi; Bukit Baka and Tangau Pecak forest blocks) evaluated as a potential site for a second Javan rhino population (desk study and field investigations).	2008	BirdLife	USD 8,000
3.7	Decision taken to identify a large site (> 400,000 ha) to establish a second Javan rhino population on Java or Sumatra.	2009	Rhino Task Force	No specific budget required
3.8	Government approval obtained for selected very large site to establish second Javan rhino population.	2010	Rhino Task Force	No specific budget required
3.9	The selected second Javan rhino site (an existing Protected Area of at least 400,000 ha) to receive rhinos secured[9], through training and equipping of an adequate ranger force, and possible conflicts resolved including establishing adequate liaison with local Governments.	2010 – 2012	MoF with support of Rhino Task Force	USD 75,000 / year
3.10	Decision taken on location in an area inside or close to Ujung Kulon (e.g., Air Mokla) for a large, intensively-managed, temporary transition and reproductive capacity assessment facility for Javan rhino candidates for future translocation.	2009	Rhino Task Force	No specific budget required
3.11	Detailed design developed and operational protocols (including the number of rhinos to be captured) formulated for temporary transition and assessment facility, to be approved by Rhino Task Force.	2009	Rhino Task Force commissions, IRF	USD 20,000
3.12	The temporary transition and assessment facility constructed; electric	2009	IRF, YABI, MoF	USD 250,000 to

[9] In the context of this document, the term *secure* refers to the situation in which forested habitat available and anti-poaching patrols are in place.

ACTION PLAN for CONSERVATION of JAVAN RHINOCEROS *Rhinoceros sondaicus*				
No.	**Main Results / Outputs Javan Rhinoceros Conservation (2007 – 2017)**	**Done by Year**	**Main Responsibility**	**Estimated Minimal Budget (in USD)**
	fencing, water supply, housing of staff, road access, etc., large enough for the animals to behave naturally (i.e., not to become domesticated).			establish; USD 50,000 / year running costs
3.13	Protocol to assess and define animals suitable for translocation (also based on experiences in India and Southern Africa) formulated and approved by Rhino Task Force.	2008	Rhino Task Force commissions, IRF, YABI	No specific budget required
3.14	Reproductive capacity of captured rhinos held in temporary transition and assessment facility studied and assessed; animals of poor quality will be released back into Ujung Kulon NP immediately.	2009 – 2010	IRF, YABI	USD 10,000 / rhino
3.15	Temporarily held rhinos studied regarding feeding and breeding behavior without allowing the rhinos to become domesticated.	2009 – 2010	IRF, YABI	USD 40,000 / year
3.16	Once natural breeding behavior is being regularly observed, rhinos translocated as a founder population in new secure Javan rhino areas.	2011 onwards	IRF, YABI, WWF	USD 50,000 / rhino
3.17	Feasibility study on the development and establishment of a Javan rhino sanctuary in Ujung Kulon National Park or another suitable site.	2009 – 2010	IRF, YABI, MoF	No specific budget required
3.18	Preparation for the development and establishment of a Javan rhino sanctuary, including raising adequate funds.	2010 onwards	IRF, YABI, MoF	No specific budget required
4.	**CO-EXISTENCE OF RHINOS AND PEOPLE**			
4.1	Conservation awareness activities designed and conducted for Government officials and decision makers regarding the status of Javan rhinos and the need to conduct active habitat management.	2008 – 2009	UKNP, WWF, YABI	USD 30,000 / year
4.2	Outreach activities designed and conducted for local communities regarding the status of Javan rhinos and the need to conduct active habitat management.	2008 - 2009	UKNP, WWF, YABI, UNESCO, Sultan Ageng Tirtayasa University	USD 40,000 / year
4.3	Conservation education materials designed produced and disseminated	From	WWF, UNESCO,	USD 50,000 /

ACTION PLAN for CONSERVATION of JAVAN RHINOCEROS *Rhinoceros sondaicus*				
No.	**Main Results / Outputs Javan Rhinoceros Conservation (2007 – 2017)**	**Done by Year**	**Main Responsibility**	**Estimated Minimal Budget (in USD)**
	in very large numbers regarding the status of Javan rhino and Ujung Kulon National Park for schoolchildren living in the direct vicinity of the Park.	2008 onwards	UKNP, YABI, Sultan Ageng Tirtayasa University	year
4.4	Appropriate community development activities which have a direct conservation benefit designed and implemented.	From 2008 onwards	WWF, UNESCO, YABI, UKNP, Sultan Ageng Tirtayasa University	USD 75,000 / year
5.	**RESEARCH**			
5.1	Rhino census protocol (both Javan and Sumatran) assessed, improvements made and staff of all National Parks holding rhinos trained in the new protocol.	2008	IRF, WWF, UKNP, YABI, IPB	USD 5,000 assessment + USD 10,000 / training of 1 Park = USD 55,000
5.2	Javan rhino census (total count using transects) undertaken and documented once every 2 years.	2007 onwards	UKNP, Institut Pertanian Bogor, YABI, WWF	USD 10,000 / census
5.3	Automatic camera trap survey remains operational to study rhino population (range, sex & age structure) and results are captured and circulated in technical reports and / or scientific publications.	Ongoing	WWF	USD 40,000 / year
5.4	Rhino dung collection and DNA analysis remains operational to study rhino population (range, sex and age structure) and results are captured and circulated in technical reports and / or scientific publications.	Ongoing	WWF, Lembaga Ilmu Pengetahuan Indonesia, and Columbia University (USA)	USD 40,000 / year
5.5	Video-trapping of Javan rhinos initiated to study population composition.	2008 onwards	Institut Pertanian Bogor	USD 25,000 / year

4.1 Protection of Javan Rhinos

4.1.1 Rhino patrols improved by covering areas outside the standard patrol routes from 2007 onwards.

Most patrols appear to use fixed routes. In order to provide better security, it is important that patrols vary their routine and venture off the normal trails as well. The Action Plan calls to improve patrol protocols and foresees improved documentation of patrol routes using GPS and GIS, as well as capturing standard effort parameters (distances and time). Twice annually, reports will be stored in the IRIS.

4.1.2 Three Rhino Protection Units (RPUs) equipped, trained and deployed throughout the implementation period of Rhino Century Program

Since 2001, three RPUs, comprised of Park rangers and trained members of the local community, have been operational in Ujung Kulon National Park. The mix of the teams provides a balance between staff with law enforcement powers and local people's knowledge of the terrain and provides a good link with neighboring communities from which Unit members originate. Over the years, the RPUs have proven to be effective in deterring rhino poachers as well as enhancing the presence of Park personnel in the field and thus deter other illegal activities such as bird poaching, fishing and logging. The Action Plan foresees continuation of existing RPUs, and if deemed necessary, the addition of one more Unit.

4.1.3 Two Marine Patrol Units are equipped and fielded throughout the implementation period of Rhino Century Program

With a long and remote shoreline, Ujung Kulon National Park is easily accessible from the sea. To deter poachers from entering the Park from the sea, Marine Patrol Units (MPUs) have been fielded since 2001. Each MPU has a boat and is manned by Park staff. Over this period of operation, numerous incidents involving people attempting to enter the Park from the sea have been reported and stopped, demonstrating the protection value of these teams. The boats also are used to ferry larger numbers of rangers and RPUs between different sites within the Park.

4.2 Javan Rhino Habitat Management

4.2.1 Stands of Arenga palm on at least 4,000 ha in Ujung Kulon National Park eradicated by 2010 to provide more space for rhino food plants

Wherever Arenga palm grows, it over-shades rhino (and other species') food plants. An estimated 18,000 ha of the Ujung Kulon peninsula now is occupied by the palm. Since 2003, studies have been underway to find an effective way of controlling this invasive species. Direct injections with RoundUp herbicide have proven to effectively kill the palm without leaving harmful chemical traces in the soil. As a next step, a larger area of Arenga palm will be destroyed to in order to study the succession of rhino food plant species. Effectiveness of new growth of food plants and whether rhinos use these new feeding areas will be determined. Eradication of Arenga palm will be accomplished either manually or using RoundUp. One concern is that local communities will not understand that Arenga palm is being eliminated while at the same time logging is forbidden in the Park. Therefore, an awareness campaign will be launched, explaining the need for

intensive habitat management to local communities and also to local Government officials.

This initiative must be well-documented via publicly available technical reports and, if successful (i.e., rhinos do use the newly available feeding habitat), replicated on an area equal to about one-third of the current Arenga palm stand.

Prior to undertaking this effort, any legal obstacles to removal of Arenga palm from the Park must be addressed. A submission to the Ministry of Forestry is the first step in the Action Plan.

4.2.2 Active management of grasslands and suppression of Javan banteng populations undertaken by 2008 so that competition for food between Javan rhinos and banteng in Ujung Kulon National Park reduced

Although it is not well-documented that banteng compete with rhino for food in Ujung Kulon, it is advisable to use the precautionary principle[10]. In order to reduce the likelihood of such competition, existing banteng feeding grounds (open grasslands) should be maintained so that overgrowing with bushes is prevented. Establishing two or three additional grassland areas should be considered. With an estimated 800 banteng in the National Park, removing a one-quarter to one-third of the population (i.e., maintain the Banteng population at about 500–600 animals and at maximum the number of banteng which was present during the time of rapid Javan population growth during the 1970's) will not harm the banteng population and may benefit the rhino population through an increased supply of food. As mentioned earlier, a detailed plan that takes into account the threatened status and need for intensive management of the banteng as well needs to be formulated, agreed upon, and implemented.

4.3 Javan Rhino Population Management

4.3.1 A site to establish a second wild Javan rhino population selected by 2008.

Preparations to select and then secure a site for establishing a second Javan rhino population need to begin immediately. With accelerating pressures on all natural habitats in Indonesia, suitable Javan rhino habitat is decreasing and may not be available when the time comes to actually relocate rhinos. A new site within the historical Javan rhino range in Java and Sumatra needs to be identified and secured under the auspices of the Rhino Task Force.

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[10] The **precautionary principle** is a moral and political principle which states that if an action or policy might cause severe or irreversible harm to the public, in the absence of a scientific consensus that harm would not ensue, the burden of proof falls on those who would advocate taking the action. This principle is usually applied in the context of the impact of human actions on complex systems where the consequences of actions may be unpredictable.

[10] *Sanctuary* in the context of this document means a very large enclosed area of natural habitat that may serve multiple functions for rhino conservation, including (1) a transition and assessment area for rhinos that are to be translocated; (2) a study area to expand knowledge of the ecology and behaviour of these still little known species, and/or (3) to produce offspring in a secure and managed situation for eventual release into the wild.

The Rhino Task Force will commission an assessment team to objectively evaluate sites on their suitability to hold Javan rhinos in the future. The Action Plan foresees that several sites may be provisionally listed several sites, including Gunung Halimun, Tesso Nilo, Berbak National Parks and the Harapan forest.

Criteria for final site selection were identified in the 1993 Indonesian Rhino Conservation Strategy and the report and recommendations of the 1997 Javan Rhino Colloquium. Sites must:

1. Be within the historic range of the species.
2. Have a carrying capacity of at least 100 animals (assuming a need of 15 km^2 per rhino). For the purposes of testing management protocols, small small numbers of translocated animals could be established in an area where no minimum viable population can be supported. However, this approach may lead to problems of animals wandering away from areas where they are protected.
3. Contain sufficient food resources (both in terms of species and abundance) to meet dietary requirements.
4. Be within the historic Javan rhino range.
5. Contain adequate water, wallows, saltlicks, and other essential habitat features.
6. Have low adjacent human population densities.
7. Have a low risk of predation on young.
8. Have a minimal legal status as a National Park or Nature Reserve with the level of protection of a National Park.
9. Not have domestic livestock present (to avoid disease transmission), and no hunting, logging, or firewood collection can be permitted in the area.
10. Have the capacity to reach pre-determined levels of security before any deliberate capture starts or any isolated animal is moved there.
11. Demonstrate well-established extension efforts with local communities, with the re-introduction project providing employment if possible.
12. Show minimal threats to the release, e.g., loss of habitat to forestry, pollution from the outside, etc.
13. Have good communications and access.

4.3.2 A very large site (400,000 ha) for a second Javan rhino population secured by 2011

Once the site is selected, security has to be established. The minimum standards are to have the site clearly demarcated in the field, the consent of local governments and communities obtained, and staffed with an adequate force of trained. A conservation education campaign is required to build positive relationships with local constituencies.

4.3.3 A temporary holding and assessment facility established by 2010

Inside or near Ujung Kulon National Park, a temporary facility will be constructed. In this facility, captured Javan rhinos will be held to assess their reproductive capacity as soon as they have adjusted to the new conditions, and to study their feeding and breeding behavior. Animals which appear not to be suitable for breeding will be returned and released in Ujung Kulon National Park immediately. Capture operations and breeding capacity assessment protocols will be formulated under the auspices of the Rhino Task Force, as will the site selection and facility design.

The temporary holding facility, which will function as a transition facility, should be big enough for captured rhinos to express their natural behavioral repertoire. All efforts will be made to prevent habituation to humans; animals must as wild as possible. Well-trained and experienced staff and adequate faculties must be in place to allow nominally-invasive assessments of the animals' health and reproductive status.

If animals show clear signs of breeding behavior, they will be moved to the Protected Area in which the second population is to be established (see 1.4.2), and released. If animals do not demonstrate a proclivity to reproduce, they will be returned to Ujung Kulon National Park for release into the wild. All founder animals and their progeny will be used to establish a second population in the wild elsewhere in Indonesia. No Javan rhinos shall remain in permanent captivity in zoos.

A request from the Government of Vietnam to allow one male Javan rhino to be brought to Vietnam's Cat Tien National Park is also one possible scenario that should be considered. Cat Tien has an estimated three to seven Javan rhinos (the only other Javan rhino population on the world), of which one is definitely a female. If no signs of breeding are discovered in the very near future, the authorities in Vietnam may make a request to the GOI to send one male to Vietnam for an intensively-managed breeding program. This is a last resort option to maintain the Cat Tien National Park population. If such a request is brought forward, the Rhino Task Force will prepare advisory notes for the Government to provide a scientific basis for a decision.

4.3.4 Feasibility study concerning to establish a Javan rhino sanctuary completed by 2010

An ex-situ population of Javan rhinos, maintained in a semi-natural sanctuary, could be important in maintaining Javan rhino genetic diversity and availability in the long-term, particularly given the uncertainties faced by the *in-situ* population from poaching, habitat destruction and natural disasters. A feasibility study and business plan to develop a sanctuary at the most appropriate site in the historical range of the Javan rhino, including Ujung Kulon National Park, will be conducted.

4.4 Co-Existence of Javan Rhinos with People

4.4.1 Awareness campaign targeting local governments conducted by 2008 - 2009

An awareness campaign will be designed and implemented for local Government officials. With decentralization for responsibility of management of natural resources to local governments, it is am essential to highlight Ujung Kulon's global significance (as reflected in the Park's UNESCO's World Heritage Status) to District and Provincial policy and decision makers. This campaign aims to provide information on the status of Javan rhinos and Ujung Kulon National Park in order to receive more support from and local "ownership" by local governments for conservation measures taken by the Park authorities. The campaign also will inform and engage local decision-makers about the needs and plans to conduct active habitat and population management (e.g., (Arenga palm eradication and Javan banteng population management) activities to ensure a broad basis of understanding and support.

4.4.2 Awareness campaign amongst local communities conducted by 2008

As mentioned in 1.5.1, local communities will also have to be informed regarding Ujung Kulon National Park's intentions to eradicate Arenga palm, to reduce Javan banteng numbers and to capture Javan rhinos for translocation to establish a second population. Broad-based knowledge and understanding of the issues faced by the National Park and the Javan rhino population, is critical to engendering public support for the Park's work.

4.4.3 A continuous outreach program underway targeting local schoolchildren in the vicinity of Ujung Kulon National Park

Building understanding of the Park's biodiversity and management objectives among its neighbors is essential to gain the support from local communities. Different target audiences require specific media and approaches and incorporating Park staff in conservation education work could substantially boost the Park's image and relationships with those audiences. This result proposes the mass production of education materials for all schoolchildren in the vicinity of the Park so that future generations are instilled with conservation knowledge, "ownership" of their rich biological heritage, and develop a lifelong conservation ethos.

4.4.4 Appropriate community development activities with a direct conservation benefit designed and implemented throughout the lifespan of Rhino Century Program

In order to establish and maintain good relationships with neighboring local communities, it is important that Ujung Kulon National Park be involved with helping people to establish stable livelihoods. The assumption is that if people have productive and sufficient livelihoods, they are less likely to enter the National Park to collect resources. For this assumption to be true, it is crucial that livelihood support activities target people who are or are likely to negatively impact on the Park's resources. These could be fishermen, poachers or the very poor people living in the vicinity of the Park. A feasibility study of the costs and benefits of potential alternative livelihoods that can provide conservation benefits and/or reduce pressures on the Park's resources needs to be undertaken.

4.5 Research on Javan Rhino

Research plans and study results have to be made available to a wide audience, including relevant authorities and the general public, in the form of technical reports, seminars, scientific publications and files on the world wide web. The Indonesian Rhino Information System (IRIS) should be provided copies of plans and reports, and will act as the clearing house of knowledge gathering regarding both Javan and Sumatran rhinos in Indonesia. IRIS is housed in the Directorate General Forest Protection and Nature Conservation (PHKA) of the Ministry of Forestry and is supervised by the Rhino Task Force.

Information gathered under this research program will inform and guide other elements of Rhino Century Program, most notably the Javan rhino capture, translocation and establishment of a second population program component.

4.5.1 The Javan rhino population in Ujung Kulon National Park monitored through bi-annual censuses

Since 1967, Ujung Kulon National Park has executed standardized censuses of its rhino population using foot print measurements (see Figure 4). Although these surveys do not provide absolute rhino numbers (due to their limitations in space and time), they do provide valuable index data which allow estimates of population trends. These censuses will be continued throughout the implementation period of Rhino Century Program. Prior to the next census, an expert team will review the methodology used and advice on possible improvements. The revised, standardized census protocol is to be used for both Javan and Sumatran rhino monitoring purposes.

4.5.2 Sex and age structure of Javan Rhinoceros population monitored through camera trapping

Since 2003, WWF has used infra-red triggered camera traps in Ujung Kulon National Park to provide hard-to-obtain information on the population's sex and age structure and possibly to allow identification of individual rhinos. This work is based on earlier work conducted by Griffiths (1993). A few pictures of young animals were taken in 2002, demonstrating that, at least 5 years ago, the population was reproducing. It is important to continue with these camera trap activities in order to secure good population estimates, and to document the population's reproductive activities. These data can provide “early warnings" for possible unforeseen crises with the rhinos in the Park. Results of ongoing and future camera trap studies need to be carefully analyzed and published in publicly available technical reports and / or scientific publications.

Along similar lines, Institut Pertanian Bogor has indicated its desire to start using automatic video cameras to capture footage of Javan rhinos.

4.5.3 The genetic composition of the Javan Rhinoceros population studied by 2008

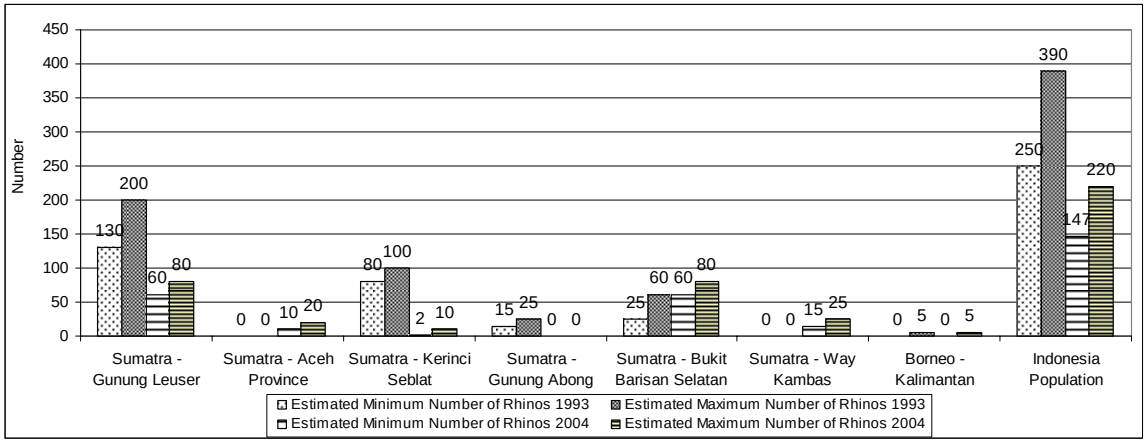
In 2001, Columbia University (New York - USA) attempted to identify individual animals from fecal DNA. DNA fingerprinting could potentially provide the most reliable population data possible. Initial results, however, were not conclusive (Fernando and Melnick, 2004), but this may have been related to contamination problems with samples collected. Additionally, the Indian rhino primer used in the 2001 survey must be replaced with a primer from Javan rhino. To this end, an initiative is underway through a joint program of Lembaga Ilmu Pengetahuan Indonesia (LIPI), YABI (PKBI), IRF, WWF and Queens University (Canada) to extract Javan rhino primer from museum skins. These primers need to be made available to Columbia University and other interested parties for research. Columbia University will continue its research in the coming 2 years, and results are eagerly awaited. The Rhino Century Program urges and CITES and other licensing authorities to provide full cooperation for these initiatives. It also is essential that results of ongoing and future research is documented in timely and publicly available technical reports and/or scientific publications.

5 CONSERVATION STATUS OF SUMATRAN RHINOCEROS

5.1 Numbers and Trends

There are two sub-species of Sumatran rhinoceros in Indonesia; *Dicerorhinus sumatrensis sumatrensis* on the island of Sumatra and *D. s. harrissoni* in Kalimantan on the island of Borneo.

Figure 7: Population Estimates of Sumatran Rhinos in Indonesia



Data from reports and personal communications from RPUs

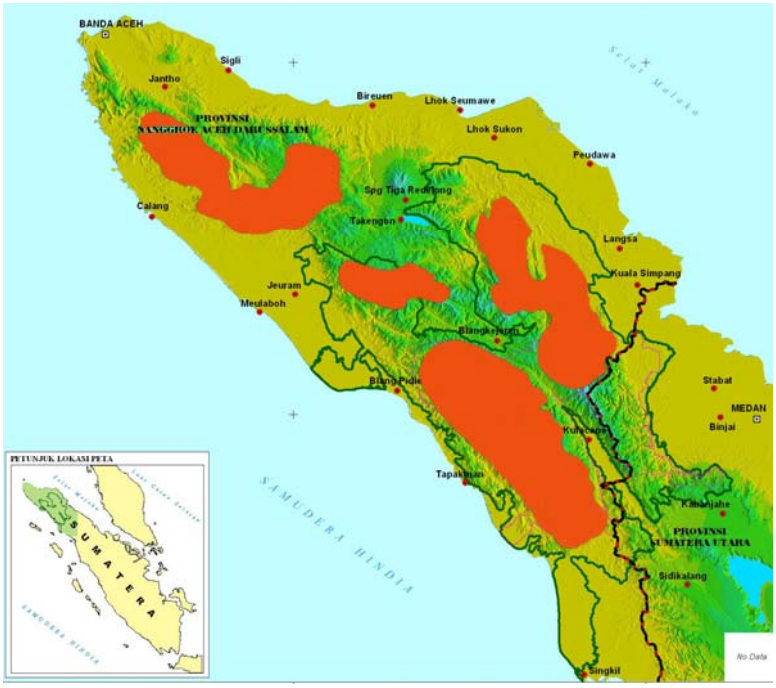
Compared to 1993 (250–390; Indonesian Rhino Conservation Strategy, 1993; Soemarna *et al*. 1993), the number of Sumatran rhinos has dramatically decreased in the last two decades (147–220; see Figure 7). Many rhinos were lost to poaching in the early to mid 1990s, and almost all rhinos have disappeared from Kerinci Seblat National Park. However, there is great reason for optimism. Poaching largely has been brought under control. At the moment, Sumatran rhino populations are only known to occur in Leuser National Park (60–80 animals with additional 10–15 animals elsewhere in Aceh Province), Bukit Barisan Selatan National Park (60–80 animals) and Way Kambas National Park (15–25 animals). After initial, dramatic decreases in these areas, these populations appear to be slowly expanding in number and range in recent years. This is mainly due to intensive anti-poaching measures implemented by Rhino Protection Units solely dedicated to provide security within rhino ranges.

No reliable information exists on Sumatran rhinos surviving in Kalimantan - only a few are believed to occur on the border between Sabah and Malaysia.

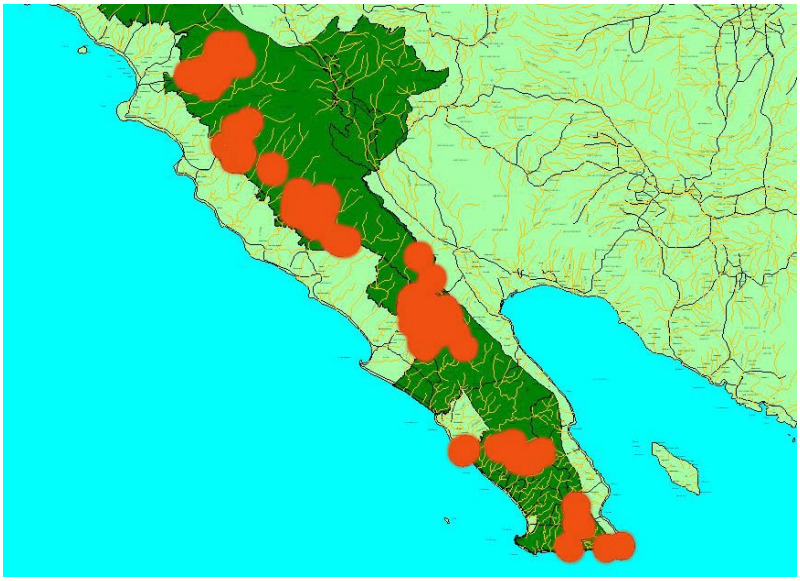
5.2 Distribution and Vulnerability

All Sumatran rhinos in Indonesia are found within National Parks. Sometimes, rhinos wander into agricultural lands adjacent to the Protected Areas. This has especially been the case in Bukit Barisan Selatan, where the forest contained in the Andatu HPH logging concession is of vital importance to rhinos. Maps 4, 5 and 6 provide an overview of the ranges used by Sumatran rhinos in the different National Parks.

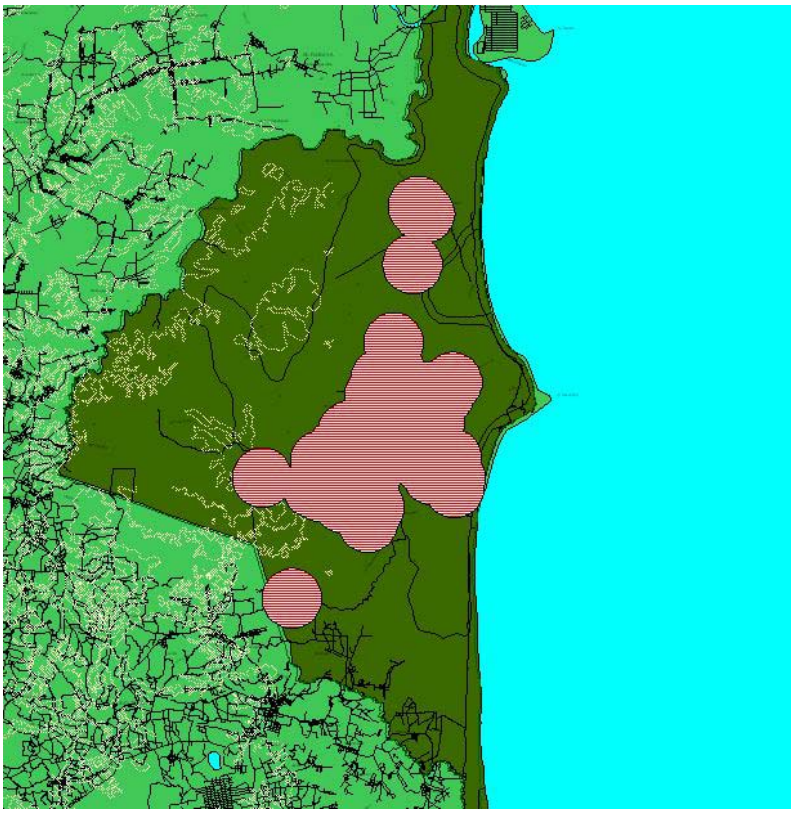
Map 4: Sumatran Rhino Range in Gunung Leuser National Park.



Map 5: Sumatran Rhino Range in Bukit Barisan Selatan National Park.



Map 6: Sumatran Rhino Range in Way Kambas National Park.



With so few Sumatran rhinos surviving in Indonesia, each population must be regarded as vital to the viability and survival of the species, and it also must be recognized that for a variety of different as well as overlapping reasons, each population is extremely vulnerable to extinction.

5.3 Security Situation

In the 1980s and 1990s, Sumatran rhino numbers in Indonesia have drastically decreased (Figure 7). Significant numbers of rhinos were poached, even from relatively inaccessible mountainous areas such as in Kerinci Seblat National Park. This dramatic trend appears to have been curtailed during the last few years of the last decade. No poaching incidents have been reported since 2002, when rhinos were being snared in Bukit Barisan Selatan National Park (Mohd Khan *et al.,* 2002).

Although the GOI has substantial staff in all the National Parks which hold Sumatran rhinos, they lack adequate financial and logistical resources. These Protected Areas also are so large that effective control of these National Parks hardly exists.

Much of the success in stopping further Sumatran rhino losses can be attributed to the activities of Rhino Protection Units (RPUs), which are forces dedicated to providing active security to rhinos. RPUs currently are deployed in Bukit Barisan Selatan and Way Kambas National Parks, and formerly in Kerinci Seblat. RPUs are comprised of regular Park rangers and local community members and are managed jointly by the respective National Parks and *Yayasan Badak Indonesia* (YABI).YABI/PKBI). RPUs with technical and financial support from the International Rhino Foundation, the US Fish and Wildlife Service, and WWF. Gunung Leuser National Park has a similar arrangement managed by the Leuser International Foundation.

Current Sumatran rhino ranges in Bukit Barisan Selatan, Way Kambas and Gunung Leuser National Parks can be considered secure. However, additional secure habitat is needed to permit rhino numbers to increase to viable population levels. The National Parks in which Sumatran rhinos occur have, with the exception of Way Kambas, more than enough habitat available to be able to expand rhino numbers. However, prior to expansion, additional security must be provided in all Protected Areas with Sumatran rhinos remaining (Table 3).

Table 3: Secure Sumatran Rhino Habitat Available and Required

Location	Current Secure Habitat (ha)	Additional Secure Habitat Required (ha)
Gunung Leuser National Park	80,000	720,000
Bukit Barisan Selatan National Park	150,000	100,000
Way Kambas National Park	50,000	10,000
Kerinci Seblat National Park	0	800,000
Bukit Tigapuluh National Park	150,000	200,000
Kalimantan	0	2,000,000

A very high priority is to secure habitat in the northern sector of Bukit Barisan Selatan to provide space for the expanding population in its southern sector. Similarly, significant additional habitat must be secured in Gunung Leuser National Park. Furthermore, habitat must be secured in Kerinci Seblat and Bukit Tigapuluh National Parks so that in the future these areas can be re-stocked with Sumatran rhinos.

A major effort is needed in Kalimantan to identify and secure enough habitats in order to bring the *D. s. harrissoni* sub-species back to Indonesia from Malaysia, where they face severe peril and diminishing numbers.

5.4 Ecological Interactions

The areas in which Sumatran rhinos currently survive are of critical importance to other large and endangered mammals as Sumatran tigers (*Panthera tigris sumatrae)*, Asian elephant (*Elephas maximus sumatrensis)* and Malayan tapir (*Tapirus indicus)*. Conservation of Sumatran rhinos therefore benefits the conservation of these species, and vice-versa. Unlike the case of banteng and Javan rhinos in Ujung Kulon National Park, there is no indication that other species compete with Sumatran rhinos.

6 CONSERVATION STRATEGY FOR SUMATRAN RHINOCEROS

6.1 Targets

The principles of conservation biology and especially the process of Population and Habitat Viability Analyses (PHVA) on all five rhino species provide guidelines for the minimum numbers and distribution of rhino to ensure genetic variability (for fitness and adaptability) and demographic security. These guidelines argue for global populations of 2,000 to 3,000 of each species distributed over at least five separate Protected Areas, each of which should be capable of accommodating a minimum of 100 rhino, preferably more. It is highly desirable to have two or more Protected Areas with populations of 400-500 rhino each.

The long-term target for Sumatran rhino conservation in Indonesia is therefore to have:

- 1,200 Western Sumatran rhinos (*Dicerorhinus sumatrensis sumatrensis*) in two populations of 400-500 and two to three populations of at least 100; and
- 600 Eastern Sumatran rhinos (*D. s. harrissonii*) in one population of 400–500 animals and two populations of at least 100 animals.

Based on a potential annual growth rate of 3%, the more immediate targets for the number of Sumatran rhinos are:

Until 2007	Stable population of ~200	Gunung Leuser, Bukit Barisan Selatan + Way Kambas National Parks (three sites) + one sanctuary (SRS)
By 2017	290 – 310	Above (four sites: + Kerinci Seblat National Park + one sanctuary)
By 2027	400 – 480	Above + (four sites + one sanctuary)
By 2037	560 – 740	As above + Kalimantan (five sites + two sanctuaries)
By 2047	790 – 1,150	As above + one additional site (six sites + two sanctuaries)
By 2057		As above + one additional site (seven sites + two sanctuaries)

6.2 Goal and Objectives

The ultimate goal of this Strategy is *to create conditions conducive to and then to actually develop viable populations of Sumatran rhinos in the wild.*

In the short term (2007–2012) the following objectives will be pursued to contribute to the long-term goal:

1. Expand the wild population in Leuser, Bukit Barisan Selatan and Way Kambas National Parks by at least 30%,
2. Secure adequate habitat for viable wild populations in Kerinci Seblat National Park (500,000 ha), Bukit Barisan Selatan National Park (100,000 ha), Gunung Leuser National Park (700,000 ha) and in Kalimantan (500,000 ha)
3. Successfully breed Sumatran rhinos in sanctuaries for reintroduction purposes.

6.2.1 Expand the wild population in Leuser, Bukit Barisan Selatan and Way Kambas National Park with at least 30%

The paramount priority of the Rhino Century Program is to sustain all current Sumatran rhino populations. By providing security and other means specified in the Action Plan below, the number of Sumatran rhinos must first be maintained at current levels. Additional habitat in the current Protected Areas also has to be secured. In this manner it may be possible to achieve a small increase in numbers inside the National Park to a total of about 250 animals.

6.2.2 Secure adequate habitat for viable wild populations in Kerinci Seblat National Park (500,000 ha), Bukit Barisan Selatan National Park (150,000 ha), Gunung Leuser National Park (700,000 ha) and in Kalimantan (500,000 ha)

The second priority of the Rhino Century Program is to ensure that additional habitat is secured within existing Protected Areas (Kerinci Seblat, Bukit Barisan Selatan and Gunung Leuser National Parks and in Kalimantan) so that populations are able to further increase. . Another option is to secure habitat in suitable Protected Areas where there currently are no Sumatran rhinos occur such as in Bukit Tigapuluh National Park.

6.2.3 Successfully breed Sumatran rhinos in sanctuaries for reintroduction purposes

Rhino Century Program supports the continuation of the managed breeding program for Sumatran rhinos in the Sumatran Rhino Sanctuary (SRS) in Way Kambas National Park as part of the global effort to establish a viable captive propagation program for this species.

Since 1998, attempts to develop a managed or captive breeding program for Sumatran rhinos have been underway in Way Kambas National Park. The Sumatran Rhino Sanctuary (SRS) is managed by YABI with the support from the international zoo community through the International Rhino Foundation. The SRS currently holds three female plus two male Sumatran rhinos; two of these females were brought into the SRS in late 2005. These are animals who became tame in Bukit Barisan Selatan and Way Kambas National Parks for which security in the wild could not longer be guaranteed by the National Parks and the RPUs. To date, no calves have been born in the SRS. Extensive investigation of the problem has revealed possible problems with both the original male and female with the most likely cause being sub-fertility or infertility of the male. However, hopes are high that the two recently-arrived females will be able to produce offspring. With the arrival of Andalas, the first Sumatran rhino bred in captivity in 112 years (Cincinnati Zoo), at the SRS is February 2007; the facility is well-poised to

successfully propagate the species. Andalas has already been introduced to these young females and is showing appropriate behavior for a young male.

7 CONSERVATION ACTION PLAN FOR SUMATRAN RHINOCEROS (2005 – 2015)

The Conservation Action Plan for Sumatran Rhinoceros presents more detailed results (or outputs) to be achieved in the period 2007 to 2012. These contribute towards the achievement of the targets, goal and objectives defined in the Strategy above. The different results are grouped as follows: protection of Sumatran rhinos, habitat management, population management, co-existence of Sumatran rhinos with humans (community development generating Sumatran rhino conservation benefits and awareness raising) and research. These are outlined below while a summary table of the Sumatran rhino strategy and action plan, defining the principal partners and estimated minimal budget requirements, can be found in Table 4.

Table 4: Strategy and Action Plan Outline for the Conservation of Sumatran Rhinoceros *Dicerorhinus sumatrensis sumatrensis* and *D. s. harrissoni* (2007 – 2012)

<table>
<tr><td colspan="3">STRATEGY for CONSERVATION OF WESTERN & EASTERN SUMATRAN RHINOCEROS Dicerorhinus sumatrensis sumatrensis & D. s. harrissoni</td></tr>
<tr><td>Current World Population</td><td colspan="2">~300</td></tr>
<tr><td rowspan="3">Current population in Indonesia</td><td>60 – 80[11] Gunung Leuser National Park (D.s.s) <100 + un-surveyed areas, remnants outside the National Park</td><td rowspan="3">Indonesia: 147 – 220</td></tr>
<tr><td>60 – 80[12] Bukit Barisan Selatan National Park (D.s.s), most in the southern portion, a few in the north. Also found in the Park buffer zone.</td></tr>
<tr><td>15 – 25 [6] Way Kambas NP (D.s.s), minimally 20 in 2005 NP survey</td></tr>
<tr><td>Historic % in Indonesia</td><td colspan="2">D.s.s.: 70 % (70% currently); D.s.h.: 90% (~0% currently)</td></tr>
<tr><td>IUCN-AsRSG global target</td><td colspan="2">2,000–3,000 animals globally for the species, including at least two populations of at least 400 – 500 animals + at least five populations of at least 100 animals</td></tr>
<tr><td rowspan="6">Habitat available</td><td colspan="2">800,000 ha in Gunung Leuser National Park (80,000 ha secure)</td></tr>
<tr><td colspan="2">300,000 ha in Bukit Barisan Selatan National Park (150,000 ha secure)</td></tr>
<tr><td colspan="2">60,000 ha in Way Kambas National Park (50,000 ha secure)</td></tr>
<tr><td colspan="2">800,000 ha in Kerinci Seblat National Park (partly secured by anti-poaching)</td></tr>
<tr><td colspan="2">2,000,000 ha in Kalimantan (some areas secured by anti-poaching)</td></tr>
<tr><td colspan="2">Also suitable habitat in Bukit Tigapuluh National Park 150.000 ha now, to 350.000 ha in the near future; expanding + secure)</td></tr>
<tr><td>Main conservation issue</td><td colspan="2">Not enough secure habitat available for slowly recovering Sumatran rhino populations, but overall there is sufficient habitat available for target populations.</td></tr>
<tr><td>Targets for Indonesia (based on 3% annual growth rate)</td><td colspan="2">
<table>
<tr><th>Targets</th><th>Total Population</th><th>400 – 500 populations</th><th>100+ populations</th><th><100 populations</th></tr>
<tr><td>Western Sumatran Rhino</td><td>1,200</td><td>2</td><td>2–3</td><td>0 – 2</td></tr>
<tr><td>Eastern Sumatran Rhino</td><td>600</td><td>1</td><td>2</td><td>0</td></tr>
</table>
</td></tr>
</table>

[11] 2004 data from RPU of Leuser Foundation.
[12] 2004 data from RPUs of YABI.

	Time	Targets	Locations
	Until 2007	Stable population of ~ 200	Gunung Leuser, Bukit Barisan Selatan + Way Kambas National Parks (three sites) + one sanctuary (SRS)
	By 2015	290 – 310	Above (four sites: + Kerinci Seblat National Park + one sanctuary)
	By 2025	400 – 480	Above + (four sites + one sanctuary)
	By 2035	560 – 740	As above + Kalimantan (five sites + two sanctuaries)
	By 2045	790 – 1,150	As above + one additional site (six sites + two sanctuaries)
	By 2055		As above + one additional site (seven sites + two sanctuaries)

Additional habitat required	1,270,000 ha to be secured immediately (500,000 ha in Kerinci Seblat National Park; 100,000 ha in Bukit Barisan Selatan National Park; 700,000 ha in Gunung Leuser National Park)
	500,000 ha to be identified and secured in Kalimantan by 2012
Goal (long-term)	Create conditions conducive to and then to actually develop viable populations of Sumatran rhinos in the wild.
Objectives (10 years)	Expand the wild populations in Leuser, Bukit Barisan Selatan and Way Kambas National Parks by at least 30%.
	Secure adequate habitat for viable wild populations initially in Kerinci Seblat NP (500,000 ha), Bukit Barisan Selatan NP (100,000 ha) and in Kalimantan (500,000 ha).
	Successfully breed Sumatran rhinos in sanctuaries for re-introduction purposes.

ACTION PLAN for CONSERVATION OF WESTERN AND EASTERN SUMATRAN RHINOCEROS *Dicerorhinus sumatrensis sumatrensis & D. s. harrissoni*

No.	Main Results / Outputs (2007 – 2017)	Done by Year	Main Responsibility	Estimated Minimal Budget (in USD)
6.	**PROTECTION (Objective 1)**			
6.1	Park rangers equipped and trained, improving effectiveness of the Park management and security.	Ongoing	National Parks, Police, YABI (RPUs), IRF	USD 8,000 / training

ACTION PLAN for CONSERVATION OF WESTERN AND EASTERN SUMATRAN RHINOCEROS *Dicerorhinus sumatrensis sumatrensis & D. s. harrissoni*				
No.	**Main Results / Outputs (2007 – 2017)**	**Done by Year**	**Main Responsibility**	**Estimated Minimal Budget (in USD)**
6.2	At least 19 RPUs remain in place in Bukit Barisan Selatan (eight), Way Kambas (five), and Gunung Leuser National Parks (six) and Aceh and are gradually deployed in an expanding area in order to enlarge secure habitat in the Parks, throughout the implementation period of Rhino Century Program in order to provide security to the rhino populations.	Ongoing	YABI, IRF	USD 35,000 / RPU / year = USD 665,000 / year
6.3	With the securing of additional habitat, an estimated 10 additional RPUs are in place (three in Bukit Barisan Selatan, five in Gunung Leuser, and two in Kerinci Seblat National Parks).	From 2009 onward	YABI, IRF, Leuser International Foundation (for Gunung Leuser)	USD 35,000 / RPU / year = USD 350,000 / year
6.3	Protected Areas maintain good contacts with local society and governments so that preventive and pre-emptive action can be taken against rhino poachers.	Ongoing	National Parks, Balai Konservasi Sumber Daya Alam/BKSDA (Local Forestry Department Offices), partners	USD 25,000 / year / PA
7.	**HABITAT MANAGEMENT (Objective 2)**			
7.1	Encroachment inside Bukit Barisan Selatan National Park halted by 2008 and 40% (30,000 people) have left by 2010.	2008 2010	Departemen Hutan, Bukit Barisan National Park, Pemerintah Daerah (PemDa), WWF, YABI	USD 2,500 / family
7.2	A rhino conservation agenda agreed with the local people and local governments, which is implemented with the farmers operating the old Andatu HPH logging concession (containing rhinos), neighboring Bukit Barisan Selatan National Park (and formerly part of the Park) with the aim to re-gazette this area as part of Bukit Barisan Selatan/convert to protection forest in exchange for severely encroached areas inside the Park.	2009	Bukit Barisan Selatan National Park, WWF, WCS, Pemerintah Daerah (PemDa)	USD 50,000

ACTION PLAN for CONSERVATION OF WESTERN AND EASTERN SUMATRAN RHINOCEROS *Dicerorhinus sumatrensis sumatrensis & D. s. harrissoni*				
No.	**Main Results / Outputs (2007 – 2017)**	**Done by Year**	**Main Responsibility**	**Estimated Minimal Budget (in USD)**
7.3	Connectivity between the southern and northern parts of Bukit Barisan Selatan National Park is regained by compensating ~10 km^2 North of the Liwa – Krui road and West of the Danau Ranau area.	2010	BBSNP, Pemerintah Daerah (PemDa), partners	USD 125,000 for compensation
7.4	All new roads, mining and other destructive human activities in Bukit Barisan Selatan National Park halted.	2008	Departemen Kehutanan, Bukit Barisan Selatan National Park	No specific budget required
7.5	Further encroachment and other habitat destruction in Kerinci Seblat National Park halted.	2009 onwards	Kerinci Seblat National Park, Departemen Kehutanan	USD 10,000
7.6	Available habitat in Gunung Leuser National Park remains stable throughout implementation period of the Rhino Century Program and secure habitat expanded by 50% through deploying additional RPUs.	2008	Leuser International Foundation, Gunung Leuser National Park, Balai Konservasi Sumber Daya Alam/BKSDA (Local Forestry Department Offices)	Captured under 6.3
7.7	A survey in Aceh Province conducted to determine whether there are remnant rhino populations left and to determine availability of rhino habitat.	2008	Leuser International Foundation, Gunung Leuser National Park, Balai Konservasi Sumber Daya Alam/BKSDA (Local Forestry Department Offices), IRF, YABI	USD 15,000
7.8	Existing encroachment removed from Way Kambas National Park and	2010	Way Kambas	USD 8,000 for

ACTION PLAN for CONSERVATION OF WESTERN AND EASTERN SUMATRAN RHINOCEROS *Dicerorhinus sumatrensis sumatrensis & D. s. harrissoni*				
No.	**Main Results / Outputs (2007 – 2017)**	**Done by Year**	**Main Responsibility**	**Estimated Minimal Budget (in USD)**
	available rhino habitat increased by reforestation of 5,700 ha and through fire prevention and/or reforestation, including the removal of 2,000 people who will assist in habitat restoration work.		National Park, Pemerintah Daerah (PemDa)	restoration, alternative income through revolving fund (15 x USD 10,000)
7.9	500,000 ha of Sumatran rhino habitat on Kalimantan identified and officially earmarked for rhino conservation.	2010	Asian Rhino Specialist Group, Departemen Hutan, WWF (Heart of Borneo initiative)	USD 40,000
7.10	Habitats in Kerinci Seblat National Park and Kalimantan (Betung Kerihun National Park, and other suitable protected areas) are secured by enforcing conservation management and improved patrolling.	2010 onwards	PHKA, WWF	USD 100,000
8.	**POPULATION MANAGEMENT (Objective 1 & 3)**			
8.1	Capacity of staff of Governmental Agencies built to address wildlife crime, and wildlife trade through training sessions, production and distribution of information sheets, etc.	2008 – 2010	PHKA, TRAFFIC	USD 40,000 / year
8.2	A detailed plan formulated for translocation of rhinos from the heavily populated southern part of Bukit Barisan Selatan National Park to the northern part of Bukit Barisan Selatan National Park and/or Kerinci Seblat National Park formulated and approved by Rhino Task Force.	2009	Rhino Task Force commissions Asian Rhino Specialist Group, Departemen Kehutanan, NGOs	USD 25,000
8.3	Sumatran rhinos translocated as a trial from the heavily populated southern part of Bukit Barisan Selatan National Park to the northern parts of BBSNP and / or Kerinci Seblat National Park.	2010	Asian Rhino Specialist Group, Departemen	USD 500,000

ACTION PLAN for CONSERVATION OF WESTERN AND EASTERN SUMATRAN RHINOCEROS *Dicerorhinus sumatrensis sumatrensis & D. s. harrissoni*				
No.	**Main Results / Outputs (2007 – 2017)**	**Done by Year**	**Main Responsibility**	**Estimated Minimal Budget (in USD)**
			Kehutanan, NGOs	
8.4	A detailed conservation plan for the conservation of Eastern Sumatran Rhino is formulated and agreed jointly by Indonesia and Malaysia.	2009	SOS Rhino, Sabah Wildlife Department (SWD), PHKA	USD 50,000
8.5	The captive breeding program of Sumatran rhinos in the Sumatran Rhino Sanctuary in Way Kambas National Park remains operational throughout the implementation period of this Rhino Century Program with the aim to produce offspring for future release into the wild.	2008 onwards	Global Population Management Board, IRF, YABI	USD 250,000 / year
9.	**CO-EXISTENCE OF RHINOS AND PEOPLE**			
9.1	Appropriate sustainable development initiatives identified and undertaken with all communities living in direct vicinity of Parks holding Sumatran rhino populations. [SE note: again, without a feasibility and cost/benefit analysis one cannot be sure ecotourism will be feasible/cost effective….]	2008 onwards	National Parks, WWF, WCS, Pemerintah Daerah (PemDa)	USD 50,000 / year / community
9.2	Conservation education programs underway for all communities living in the vicinity of Parks holding Sumatran rhino populations.	2008 onwards	National Parks, WWF, WCS, YABI	USD 70,000 / year
9.3	The Chinese Medical Associations in Indonesia are approached, consulted and engaged through workshops etc regarding the illegality and unacceptability of use of rhino horn.	2008	YABI	USD 10,000
10.	**RESEARCH**			
10.1	Review existing data from RPUs, WCS, and WWF on Sumatran rhinos in Bukit Barisan Selatan National Park from 2006 onwards. Consider radio-tracking of rhinos in Park buffer zone (equipment tests in SRS).	Ongoing	YABI, WCS, WWF	
10.2	Surveys undertaken in Kalimantan (part of WWF's Heart of Borneo Program area), and in Sumatra's Bukit Tigapuluh National Park to	2008	WWF, Sumatran Tiger Project, YABI	USD 50,000 / survey site

ACTION PLAN for CONSERVATION OF WESTERN AND EASTERN SUMATRAN RHINOCEROS *Dicerorhinus sumatrensis sumatrensis & D. s. harrissoni*				
No.	**Main Results / Outputs (2007 – 2017)**	**Done by Year**	**Main Responsibility**	**Estimated Minimal Budget (in USD)**
	determine presence of rhinos.			
10.3	Rhino census protocol (Sumatran rhinos) assessed, improvements made and staff of all National Parks holding rhinos trained in new protocol.	2008	IRF, WWF, National Parks, YABI, Institut Pertanian Bogor	USD 5,000 assessment + USD 10,000 / training of 1 Park = USD 55,000
10.4	Sumatran rhino census (total count; transects) undertaken and documented every 2 years.	2007 onwards	National Parks, Institut Pertanian Bogor, YABI, WWF	USD 10,000 / census

7.1 Protection of Sumatran Rhinos

The Rhino Century Program will ensure the adequate equipping and training of Park rangers so that Protected Areas can be better secured against poaching threats. In total, the Action Plan entails sustaining the existing 19 Rhino Protection Units, deployed in Bukit Barisan Selatan (eight Units), Way Kambas (five Units) and Gunung Leuser National Parks (six Units) and Aceh Province. These Units consist of specially trained Park rangers and members of nearby communities. They will be deployed over an area which is to expand in time (see Section 7.3). Indeed, it is recommended that another ten Units be added over the next 5 years in Bukit Barisan Selatan (three), Gunung Leuser (five), and Kerinci Seblat (two) National Park. Experience with RPUs deployed in Bukit Barisan Selatan and Way Kambas National Parks is that these units are essential to suppress poaching.

The Rhino Century Program also calls for improved communication between National Parks and surrounding communities. Good relationships with neighboring communities are essential to improve support for the Parks and conservation from the general public, which, in turn, is needed to intercept potential poachers.

7.2 Sumatran Rhino Habitat Management

7.2.1 Bukit Barisan Selatan National Park

Bukit Barisan Selatan National Park has a rich biodiversity of which the presence of rare and endangered mammalian species such as Sumatran rhino (with an estimated 60 to 80 animals - one of the two largest populations in the world), as well as other species such as Asian elephant, Sumatran tiger, Malayan tapir and Western tarsier.. The oddly-shaped Park, narrow (20–40 km) and long (~250 km), straddles the watershed of the south east– north west oriented Bukit Barisan mountain range. The Park's shape and large area make it hard to manage and very vulnerable to a suite of threats which include encroachment, road construction, mining, and poaching.

The Rhino Century Program envisions in a number of activities which aim to secure additional habitat in Bukit Barisan Selatan National Park so that additional space for Sumatran rhinos is obtained. The highest priority will be given to further halting encroachment into the National Park, followed by efforts to reverse this trend and get people to agree to vacate illegally-occupied land within the Park boundaries.

Similarly, infrastructure (e.g., road building) and economic development activities (e.g., mining) within the Park have to be stopped immediately. Such activities in the Park's buffer zone should require adequate coordination with the National Park authorities so that conservation needs of the Park are not further compromised by unilateral decisions made by District and Provincial Authorities in an effort to generate revenue.

Additional habitat is to be secured in the northern sector of the Park which contains few rhinos. Securing the corridor on both sides of the Liwa–Krui road and to the west of the Danau Ranau area is of critical importance. An adjacent ex-HPH logging concession

(Andatu) shall get a conservation agenda to be negotiated with the local communities, to safeguard the Sumatran rhinos using this area.

7.2.2 Kerinci Seblat National Park

Kerinci Seblat National Park has suffered a dramatic decline in its Sumatran rhino population. It is believed that only a few (< 5) animals remain in the Park. The Park has, however, vast expanses of habitat suitable for Sumatran rhinos. If the species is to survive in Indonesia, large tracks of secure habitat are needed. Securing Kerinci Seblat will be key for all conservation efforts under the Rhino Century Program. Thereafter, the action plan advocates that security in this National Park is achieved by training and equipping the ranger force and by deploying RPUs to ensure security to the few remaining rhinos and to rhinos which may be translocated to Kerinci Seblat from elsewhere in the future.

7.2.3 Gunung Leuser National Park

Gunung Leuser National Park contains one of the world's two largest Sumatran rhino population (estimated to be 60-80 animals; Bukit Barisan Selatan contains the other). The expanse of Gunung Leuser National Park is vast (~9, 000 km^2), but Sumatran rhinos are concentrated in just 800 km^2. With increasing pressure on the Park mounting, it is critical to ensure a swift expansion of secure habitat to accommodate a growing rhino population. Strengthening of the Rhino Protection Unit force in Leuser National Park is therefore of utmost importance. The Rhino Century Program proposes doubling the secure habitat in Gunung Leuser to about 1,600 km^2.

7.2.4 Way Kambas National Park

A population of 15-25 rhinos survives in Way Kambas. The population was re-discovered in 1993 and may have been larger before the catastrophic fires of 1997. The lowland forests of Way Kambas National Park are under severe pressure from local communities looking for suitable agricultural lands. For example, peripheral parts of the Park have been converted into banana and cassava plantations. The Rhino Century Program will implement measures to reverse current and prevent further encroachment into the Park. An encroached area of 5,700 ha is to be reforested. Unfortunately, expansion of secure habitat is probably not possible because the Park is situated in isolation amid large stretches of agricultural lands.

7.2.5 Other possible populations and habitat on Sumatra

Occasional reports of Sumatran rhinos surviving in the northern most areas of Aceh Province (e.g., Mammas) need to be confirmed with a field survey.

On the island of Sumatra, there are considerable expanses of forest where Sumatran rhinos once occurred. Some of these forests should be safeguarded with the view of re-populating them with Sumatran rhinos in the future. One example is Bukit Tigapuluh National Park where Tiger Protection Units are already providing a firm security base for the ecosystem.

7.2.6 Kalimantan

At present, there are no indications of Eastern Sumatran rhino (*Dicerorhinus sumatrensis harrissonii*) surviving on the Indonesian part of Kalimantan. A small number

(20–30) of this subspecies survives in remnant forests in Sabah on the Malaysian side of the island. While working on the recovery of the sub-species, an adequate amount of habitat for future *D. s. harrissonii* populations has to be safeguarded and secured now. The Rhino Century Program seeks to identify and earmark at least 500,000 ha in Kalimantan.

7.3 Sumatran Rhino Population Management

7.3.1 *In-situ* Sumatran rhino population management

One of the most important *in-situ* population management activities for Sumatran rhinos is the translocation of animals from the southern parts of Bukit Barisan Selatan National Park (which has a relatively dense rhino population), to its relatively empty northern sections. The movement of rhinos will occur when security is assured in the northern areas (see Section 7.2.1).

In the longer term, beyond the time-frame of this Action Plan, Sumatran rhinos will have to be moved into Kerinci Seblat National Park possibly into Bukit Tigapuluh National Park and into the secured areas in Kalimantan. For the latter purpose, arrangements have to be made between the Governments of Indonesia and Malaysia during the implementation period of this Action Plan.

7.3.2 *Ex-situ* Sumatran rhino population management

Captive breeding of Sumatran rhinos will be continued in the Sumatran Rhino Sanctuary (SRS) in Way Kambas National Park. Recently, two female Sumatran rhinos have been brought into the SRS from Bukit Barisan Selatan and Way Kambas National Parks, and a male born at the Cincinnati Zoo (USA) was moved to the SRS in February 2007 to enhance chances of reproduction.

The ultimate aim for the captive breeding program is to re-establish populations in the wild. When breeding of Sumatran rhinos in captivity become successful, the establishment of additional sanctuaries can be contemplated in the distant future.

7.4 Co-Existence of Sumatran Rhinos with People

The Rhino Century Program proposes that Protected Areas which hold Sumatran rhinos work hard to build and continue good relationships with surrounding communities. To alleviate poverty issues, each of the Protected Areas should play a catalytic role in attracting community development initiatives from the GOI and international donors. The aim of such activities should ultimately be the reduction of pressure on the biodiversity resources of the Protected Areas. Similarly, each of the Protected Areas should actively engage with local communities in conservation education and awareness raising activities. These should aim at explaining the general importance of biodiversity, the Protected Areas and Sumatran rhino conservation needs.

The traditional Asian medicine market will be targeted for education programs on the importance of Asian rhino conservation, the lack of scientific evidence for the medicinal effectiveness of rhino parts, as well as laws governing the protection of Asian rhinos.

7.6 Research on Sumatran Rhinos

Various types of research are needed for the conservation of Sumatran rhinos. Photo-trap surveys, fecal DNA analyses and perhaps other higher-tech monitoring measures could assist in better assessing size, structure and distribution of Sumatran rhino populations. Tracking Sumatran rhinos (especially outside Protected Areas) using radio telemetry may also be useful.

A survey needs to be conducted in Kalimantan to confirm current status of Sumatran rhinos on the Indonesian side of the island and possible interaction with Sumatran rhinos in Malaysia.

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