WWF's SPECIES ACTION PLAN

for the Conservation of Orang-utans (*Pongo pygmaeus* and *Pongo abelii*) in the Wild

"FOREST PEOPLE"

August 2005

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This plan is a living document and will be reviewed and updated on a three yearly basis, first review due 2008.

EXECUTIVE SUMMARY

The orang-utan, one of our closest living relatives, once lived all the way from southern China to the foothills of the Himalayas and south to the island of Java, Indonesia. Today, the red 'man of the forest' is confined to the rapidly dwindling forests of just two islands, Sumatra and Borneo. Orang-utans are representatives of unique and natural wealth – a wealth worth more in the long term (ecologically as well as economically) than the short-term profits of activities that threaten orang-utan survival. However, in the last ten years alone, numbers have declined by 30–50%, and now just over 60,000 survive, down from probably more than 230,000 in Borneo and Sumatra 100 years ago. If efforts to protect orang-utans are not urgently strengthened, Asia's only great ape may be lost from the wild within a few decades.

In order to address the pressing need for action to save orang-utans, WWF has developed an Orang-utan Species Action Plan (SAP) that aims to secure populations of orang-utans and their habitats across their range, in harmony with people. This plan outlines how WWF and its partners will make their contribution to the long term survival of orang-utans alongside the work that is being done by others who have also made orang-utan conservation a priority. This plan is a living document and will be reviewed and updated as new research and information becomes available.

Scaling up…
The orang-utan SAP aims to conserve orang-utans and their habitats by scaling up from a selection of small projects to work on orang-utan 'landscapes' - a group of orang-utan populations, or key areas of orang-utan habitat that are, or can be linked together to form a meta-population of connected populations that is genetically stable in the long term. A landscape may include a patchwork of protected areas, managed areas which are not formally protected, and corridors. Landscape level conservation incorporates the presence and participation of communities, governments and industries to mitigate key threats and implement landscape management in a way which benefits both human communities and orang-utan survival and recovery.

Focusing efforts…
However, the plan also acknowledges that the resources for orang-utan conservation that are available within WWF and its partners are finite. Therefore, to ensure that the best possible use is made of these available resources, the SAP focuses efforts on four priority orang-utan landscapes only, where WWF, in conjunction with governments, local communities, industry, other non-governmental organizations, economic parties and international conservation partners, has the best chances of achieving meaningful, long-term results for orang-utan conservation. The four priority orang-utan landscapes are all in the island of Borneo, will cover approximately 45,000km2 in total, and are estimated to contain around 24,530 – 28,700 orang-utans, including all three recognised sub-species of Bornean orang-utan, which is about one half of all orang-utans on Borneo.

The four priority orang-utan landscapes are:

1) Betung Kerihun / Danau Sentarum, West Kalimantan, Indonesia

This landscape includes two National Parks and the important corridor connecting them which may contain higher populations of orang-utans than the protected areas themselves.

2) Sebangau, Central Kalimantan, Indoneisa

This landscape comprises Sebangau National Park, an area of 5,780km2 that holds one of the largest known remaining orang-utan populations in the world and was gazetted by the government of Indonesia in October 2004.

3) Kinabatangan and Segama River catchments, Sabah, Malaysia

This landscape contains the main stronghold for the Northeastern Bornean orang-utan. The area boasts a relatively small human population but significant proportions of the landscape are taken up by forest concessions and oil palm plantations.

4) Arut/Belantikan - Bukit Rongga/Perai forest, cross-border of West and Central Kalimantan provinces, Indonesia

This area has been identified by orang-utan specialists as the top priority for conservation action in Borneo. The landscape contains a relatively intact forest area extending almost 10,000km2 and a large population of orang-utans, but significant conservation activities are only just beginning in the area.

The SAP focuses on the priority orang-utan landscapes, but will also embody cross-cutting issues such as trade and land use policy that will affect important orang-utan habitat, both within and beyond, the priority orang-utan landscapes.

The SAP consists of a series of objectives that fit into five overall categories.The first category of objective addresses the policy and development framework operational in important orang-utan habitats within but also beyond the priority orang-utan landscapes.

1	By 2010, legislation, regulation and land-use policies relevant to orang-utans are improved

The second Category of Objective focuses on the conservation of orang-utan habitat in the priority landscapes.

2	Secure and well managed orang-utan habitat in the 4 priority landscapes by 2015

The third Category of Objective focuses on the protection of orang-utan populations through the reduction of poaching and trading of orang-utans at local, domestic and international levels. This category of objective will be implemented in close collaboration with TRAFFIC, the wildlife trade monitoring network that is a joint programme of WWF and IUCN- the World Conservation Union.

3	Poaching and trade is no longer a threat to orang-utan populations by 2015

The fourth Category of Objective focuses on generating the mutually beneficial incentives for the co-existence of people and orang-utans in the priority landscapes. It does this through the development of sustainable livelihood projects for communities living alongside orang-utans, and by reducing conflicts between humans and orang-utans.

4	Incentives are created for the co-existence of people and orang-utans by 2010

The fifth Category of Objective focuses on creating public support for orang-utan conservation, creating awareness of the threats to orang-utans and influencing attitudes and behaviour to benefit their mitigation.

5	Public attitudes and behaviour supports the conservation of orang-utans by XXXX (to be defined by Nazir)

Finally, the plan outlines the framework through which the programme with be implemented and coordinated both within the WWF network, and with external partners and stakeholders.

This orang-utan SAP provides the direction and impetus how WWF can make its contribution to the collaborative, long term, and sustained effort that is needed to ensure that orang-utans will have a long term future in their last remaining forest home.

However, the SAP is by no means an exhaustive outline of what must be done to ensure that this enigmatic and important species is not lost forever. No one organisation can accomplish this alone, and successful conservation of the orang-utan will call, as never before, on the ability of people and organisations to work together. *Please join us.*

1. THE RATIONALE FOR CONSERVING ORANG-UTANS

1.1 The ecological role of the orang-utan within its habitat

Orang-utans are an integral part of the forest habitats in which they live. A large proportion of the orang-utan's diet is fruit ranging from large, hard-shelled varieties containing big seeds such as wild durians, to small, soft-fleshed fruits with small seeds, such as figs. By eating fruits and excreting or spitting out the seeds, orang-utans help to disperse various plant species. In addition, studies have indicated that the passage of seeds through the gut of the orang-utan may facilitate germination in some species. However it is also likely that the seeds of other species are damaged or destroyed either by chewing or by digestion in the gut.

Insects are an important source of protein for the apes, particularly for pregnant females. When orang-utans harvest caterpillar blooms they play a role in controlling the spread of insects which damage the young leaves of forest trees.

Orang-utans help to maintain the dynamic equilibrium of the rain forest ecosystems in which they live. For example, foraging behaviours of orang-utans such as bark stripping, foliage consumption, and consumption of buds and flowers can damage plants. Orang-utans break branches incidentally when travelling through the forest and may break off branches deliberately and throw them down from the canopy when frightened.

1.2 Conservation of associated biological diversity

As orang-utans need large areas of forest to survive, in general it can be said that to ensure the survival of the orang-utan, large areas of good quality habitat must be conserved, thus orang-utan conservation simultaneously protects a vast array of other species and vital ecosystem services for local communities such as medicinal plants and other forest products. Were it not for flagship species like the orang-utan, many protected areas would not exist today. The orang-utan, as an enigmatic and widely known 'flagship species', is a strong ambassador for the ecosystems in which it lives and the issues which threaten its survival.

There is an extremely wide variety of associated biological diversity in the forests inhabited by orang-utans, and many of the areas that contain significant populations of orang-utans also contain important populations of other threatened species. For Borneo this includes mammal species such as the proboscis monkey (*Nasalis larvatus*) and the white-fronted leaf monkey (*Presbytis frontata*). For Sumatra, this includes tigers (*Panthera tigris*), the Malay tapir (*Tapirus indicus*) and the Asian wild dog (*Cuon alpinus*). For both Sumatra and Borneo, this includes the clouded leopard (*Neofelis nebulosa*), the Malayan sun bear *(Helarctos malayanus)*, the Sumatran Rhinoceros (*Didermoceros sumatrensis*) and the Asian elephant (*Elephas maximus*). Species Action Plans similar to this plan have also been prepared by WWF For Asian elephants and rhinos (AREAS) and for tigers.

1.3 Orang-utans and WWF's Global 200 Ecoregions

An ecoregion is defined as large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions. Of the vast array of different ecoregions on earth, WWF has identified a list of the most biologically outstanding terrestrial, freshwater and marine ecoregions called the 'Global 200'. The Global 200 list provides a critical blueprint for biodiversity conservation at a global scale.

Orang-utans are commonly found in two WWF Global 200 Ecoregions, and have been recorded in a third:

- 26. Sumatran Islands Lowland and Montane Forests, Indonesia
- 31. Borneo Lowland and Montane Forests, Indonesia and Malaysia
- 107. Kinabalu Montane Shrublands, Malaysia (occasionally, up to 1500 m)

These ecoregions are priority areas for WWF to engage in holistic, wide ranging and long term conservation efforts. The orang-utan has great potential to act as a flagship for the conservation of these important areas.

1.4 Other motivators for orang-utan conservation

Orang-utans are of great scientific interest. They are the only great ape species that exists outside of Africa, and they share approximately 97% of their DNA with humans. Indeed 'orang-utan' in Malay means 'man of the forest'.

Orang-utans, as an extremely charismatic megafauna species, have significant potential to generate income in the regions they inhabit through responsible and sustainable ecotourism. The revenues from orang-utan ecotourism could be larger in the long term than the cumulative revenues that are available for consumptive uses of orang-utans, such as poaching.

2 ORANG-UTAN NATURAL HISTORY, DISTRIBUTION AND ABUNDANCE

2.1 Taxonomy

Until relatively recently, only a single species of orang-utan was recognised, known as *Pongo pygmaeus*, with two subspecies, *P. p. pygmaeus* in Borneo and *P. p. abelii* in Sumatra. However consistent differences between the apes from Borneo and Sumatra in characteristics such as mitochondrial DNA, karyotype, habitats and morphology indicates that there has been a prolonged separation of the two island populations and suggest that the two are best treated as distinct species of orang-utan: *Pongo abelii*, the Sumatran orang-utan and *Pongo pygmaeus*, the Bornean orang-utan.

2.2 Morphology

The adult orang-utan is a large ape with red-brown hair, measuring 1.25 to 1.50 metres from head to toe, with an arm span of over 2 metres. An adult female orang-utan weighs between 30 and 50 kg, males between 50 and 100 kg. Adult males may develop the large cheek pads that are characteristic of the species. Orang-utans are the only great apes that have two distinct morphological phases, with or without the cheek pads, and these possibly reflect distinct mating strategies.

Two of the morphological characteristics that distinguish the Bornean and Sumatran orang-utan are:

- Face shape: the Bornean orang-utan tends to have a rounder shape, when compared to the more oval shape of the Sumatran orang-utan's face.
- Hair colour: The hair of the Sumatran orang-utan tends to be lighter than that of the Bornean orang-utan.

2.3 Population status

It is widely believed that the number of orang-utans at the beginning of the 21st century is down to about one percent of its prehistoric population size (Bennett, 2002). At the beginning of the last century, it was estimated that about 315,000 orang-utans existed in the forests of Borneo and Sumatra. In the 1990s, this figure was probably down to 180,000 and various estimates for 2004 put the current number of orang-utans remaining in the wild at between 62,400 and 63,600 (Singleton et al., 2004, Ancrenaz et al., 2005). Under current trends it is expected that orang-utan numbers will decrease by at least 50% within the next 10 years (Hilton-Taylor, 2000).

Bornean Orang-utan *Pongo pygmaeus*

Due to its larger and more fragmented distribution, the status of the Bornean orang-utan has been more difficult to assess than that of the Sumatran orang-utan. Population estimates vary tremendously, both over time and between studies. Using the data from the Population Habitat Viability Assessment for orang-utans held in Jakarta in 2004, combined with an aerial survey of orang-utan nests undertaken in Sabah, Malaysia, it can be estimated that currently 54,900 – 56,100 orang-utans remain in numerous subpopulations on Borneo (Singleton et al., 2004, Ancrenaz et al., 2005). Although this is considerably larger than indicated by, for instance, Rijksen & Meijaard (1999) this does not indicate that all is well or that the population has actually increased, simply that different methodologies are allowing for more precise estimates to be made.

Geographic variation in the genetic make up of Bornean orang-utans has led to the further designation of thee subspecies: *Pongo pygmaeus morio*, the Northeastern Bornean orang-utan, *Pongo pygmaeus wurmbii*, the Central Bornean orang-utan, and *Pongo pygmaeus pygmaeus*, the Northwest Bornean orang-utan.

(i) Northwestern Bornean Orang-utan *Pongo pygmaeus pygmaeus.* Found in north-west Kalimantan, north of the Kapuas River and Sarawak.
The status of the Northwestern Bornean orang-utan is of concern. Population estimates are in the range of 3,000 individuals. Important populations remain largely in the Batang Ai / Lanjak Entimau areas of southern Sarawak, and in the area around and between southern Betung Kerihun and Danau Sentarum in West Kalimantan.

(ii) Central Bornean Orang-utan *Pongo pygmaeus wurmbii.* Found in South-west Kalimantan, south of the Kapuas River and west of the Barito River
The central subspecies is the most common of the Bornean subspecies (around 38,000 individuals) with an extensive, yet increasingly fragmented distribution in the swamp and lowland dipterocarp forests of central Kalimantan. Important populations of the Central Bornean orang-utan are found in Tanjung Putung National Park, the Sebangau and Mawas areas of central Kalimantan, Gunung Palung National Park in West Kalimantan and the forests that stretch along the border between the two provinces of West Kalimantan and Central Kalimantan.

(iii) Northeastern Bornean Orang-utan *Pongo pygmaeus morio.* Found in Sabah and East Kalimantan south to the Mahakam River.
The Northeastern Bornean orang-utan has its stronghold in the Upper Kinabatangan and Segama catchments in Sabah and the Gunung Gajah, Berau region of East Kalimantan. The total population size is estimated at 14,000 individuals of which 11,000 are estimated to live in Sabah. The once large population in Kutai National Park has decreased in size but may still be significant enough to warrant increased protection.

Sumatran Orang-utan *Pongo abelii*
Historically the Sumatran orang-utan was distributed over the entire island of Sumatra (orang-utans once ranged as far south as Java), but progressively its range has contracted to the north of the island. Currently it is largely restricted to the area north of Lake Toba, and is almost entirely confined to the Leuser Ecosystem. Population estimates show a progressive decline. In the Leuser ecosystem, the species' main stronghold, the population was estimated to be around 12,000 individuals in 1993, then 4,500 in 1999 and 3,500 at the end of 2002 (van Schaik et al. 2001, Wich et al. 2003.) Wich et al. (2003) surveyed all other potential sites in Sumatra for the presence of orang-utans, and concluded that it was absent in all but two small areas in the Padangsidempuan, Tarutung and Sibolga area (West Batang Toru), and the Lumut coastal swamps. Population sizes in these two sites are small and possibly not viable in the long run. The Population Habitat Viability Assessment that was conducted for orang-utans in 2004 concluded that there were 7,500 orang-utans left in the whole of Sumatra, however of the identified 13 subpopulations on the island, only 7 were assumed to be viable in the medium to long term (Singleton et al., 2004).

2.4 Habitat, population densities and geographical distribution

During the Pleistocene (1.8 million to 11,000 years BC), orang-utans could be found from the south in Java up to the foothills of the Himalayas and the Tropic of Cancer in China. Although the dramatic restriction in the geographical range occupied by the orang-utan can undoubtedly be attributed for the most part on a changing climate, data clearly show that humans and orang-utans have a preference for the same habitat types (essentially alluvial plains, lowland valleys and to a lesser extent peat swamp forest), and where humans exist in any numbers, orang-utans usually do not survive. On the whole, orang-utans currently only exist in very remote areas where humans are absent or occur at low population densities, or in areas where for one reason or another humans have refrained from hunting orang-utans (for example, due to religious restrictions). As a result, remaining viable orang-utan habitat has been fragmented into 'islands within the islands' of Borneo and Sumatra.

Orang-utans occur in a wide range of forest types, from montane forest (although this habitat type is used very rarely), to hill and lowland dipterocarp forest, riverine forest, freshwater and peat swamp forests, and can even occur in the drier landward side of mangroves and nipah palm swamp (Payne 1985; Payne 1988; Bennett 1991). Despite this wide range of habitats in which orang-utans can be found, both species are most abundant in lowland tropical rain forest, and appear to prefer at least two major geomorphological landscapes: a freshwater-fringe (a flood-plain, a peat swamp or an alluvial valley) and an adjacent dry upland region (usually foothills). Protection of this lowland habitat is essential for the long-term survival of the orang-utan.

Although orang-utans are occasionally found up to 1,500 m above sea level, these individuals are likely to be wandering males, and the vast majority of resident populations occur below 500 m, mostly in the extreme lowlands. In general, orang-utan population densities decrease with increasing altitude. However there are exceptions to this rule, and populations of orang-utans, including reproducing females, have been found on highland plateaus which are >1000 m above sea level on both Borneo and Sumatra. (Rijksen & Meijaard, 1999; Payne 1988). It is important to note that there are significant differences in the altitudinal distribution of orang-utans between Sumatra and Borneo. Data presented by Rijksen & Meijaard (1999) indicate that orang-utan population densities in the hill forests of Borneo are around 0.5 individuals per km^2, and that no resident populations are found in submontane or montane forests. On Sumatra however, orang-utans can attain densities of more than one individual per km^2 in upland and submontane forests. In general it can be said that reproducing populations are restricted to forests <500 m above sea level on Borneo and that on Sumatra this altitudinal limit lies a few hundred meters higher but certainly <1,000 m above sea level.

Population densities differ greatly between Sumatra and Borneo, with data presented by Rijksen & Meijaard suggesting that densities of Sumatran orang-utans are typically twice as high as those of the Bornean orang-utan. Even within these islands there is a large variation in densities.

Payne (1992) has suggested that the variation in the abundance of soil minerals is the reason behind the patchy distribution pattern of orang-utans on Borneo. Diseases such as malaria have also been proposed as potential limiting factors on the distribution of orang-utans (Payne et al., 1985). Hunting by indigenous tribes however is likely to be a more significant limiting factor, and in many areas it is considered that indigenous hunting was the main reason for local population extinctions (Wallace 1869; Sugardjito 1995; Rijksen & Meijaard, 1999). Mountains and rivers may form effective barriers to dispersal, resulting in a series of isolated populations. This geographic fragmentation has led to morphological differences between orang-utan populations on Borneo (Groves, 1992; 2001).

The question whether secondary forest[1] outside forest reserves is important habitat for orang-utans is a matter of intense debate. In general, it seems that degraded secondary forest shows lower overall densities of orang-utans. However, research from the Lower Kinabatangan in Sabah suggests that orang-utans manage well in secondary forest (Ancrenaz & Lackman-Ancrenaz, 2004), possibly due to an increase in fruit-bearing trees in the regenerating forest. Similar results were reported from the Kutai National Park. Furthermore, research from Sumatra indicated that it is primarily the abundance of fruit in a forest that determines its carrying capacity for orang-utans. A confounding factor in assessing the suitability of secondary forest for orang-utans is hunting. After a forest has been logged, the roads that are left behind provide easy access for humans into previously inaccessible forest areas and hunting pressure in secondary forests is therefore much greater. Overall it can be concluded that selective logging leads to a lower density of orang-utans and lower birth rates, but in the absence of hunting or other disturbances generally does not lead to the extinction of orang-utans.

For the time being, WWF concludes that slightly degraded forests or forests that are managed in a controlled and sustainable way may be appropriate habitat for orang-utans, but that the level of 'acceptable degradation' is a sliding scale that should be monitored very carefully. When prioritizing the expenditure of the limited resources available within WWF, preference should be given initially to the best preserved forest areas, rather than degraded forests. However it should be recognised that some of the more disturbed forest

[1] forest that has regrown after a major disturbance such as logging

areas do hold important populations of orang-utans, and that some degraded forests are important for linking otherwise isolated populations of orang-utans.

2.5 Life history

The orang-utan is the largest tree-living mammal on earth. They are diurnal (i.e. awake during daylight hours), and their activity peaks in the morning and the late afternoon. Orang-utans use branches and twigs to construct large tree nests in which they sleep. In general an orang-utan will make a new nest each night, but occasionally nests are re-used. This can happen when a good food source is located late in the afternoon, or when there is a lack of suitable materials to build a new nest.

Orang-utans eat mostly fruit, leaves and insects. They prefer eating energy-rich food like durian fruit, jackfruit, lychees, mangosteens, mangoes and figs, but in times of lower food abundance they will also eat bark, leaves, pith and insects. Occasionally they consume eggs and small vertebrates and they drink water from tree holes. Orang-utans are able to put on additional fat stores during periods of mast fruiting when large numbers of trees all bear fruit at the same time. This happens every two to ten years and lasts for a couple of months.

Slow reproductive cycle

Female orang-utans become sexually mature at around 10 to 15 years of age. Males do not attain full physical and social maturity, and hence reproductive capability, until 13 to 15 years of age or more. The gestation period is around 35 weeks and usually females have just one offspring, although occasionally twins have been reported. Young orang-utans are usually weaned when they are about three and a half years old. Upon reaching adolescence at about four to five years of age, young animals become increasingly independent from their mother and form small groups of their own, eventually leaving their mothers at around seven to 10 years of age.

In optimal conditions, female orang-utans usually have a period of around seven to eight years between births, but this period can be longer when conditions are worse. Orang-utans thus have one of the longest birth interval rates of all the great apes.

This extremely slow reproductive rate makes the orang-utan particularly vulnerable to any kind of population disturbance, and means that long term commitments to conservation projects are required to ensure population stabilisation or recovery. For this reason, the orang-utan makes a good flagship for WWFs Ecoregion Action Programmes, which operate on timeframes of 30 to 50 years.

Recent research by Knott (1998) indicates that female orang-utans living in habitat with low food availability have low estrogen levels. This means that the already slow reproductive cycle of orang-utans is likely to be even slower in degraded habitats, and thus places an increased importance on the preservation of good quality habitat for orang-utans.

Solitary versus social behaviour

Orang-utan populations appear to maintain a loose 'harem' type social system. Adults are generally solitary, and adult males are hostile to one another. Although temporary groupings may be formed, normally this is restricted to groupings between a male and a female for mating.

Local variation has been reported in the social organization of the orang-utan. Research in Borneo indicates that adult females (usually with dependent young,) occupy overlapping home ranges of 0.65 km^2 or less and adult males are generally solitary and use home ranges of 2 to 6 km^2. In Sumatra, both males and females live in home ranges that overlap considerably and are around 2 to 10 km^2.

There are likely to be differences in ranging behaviour and home range overlap according to food availability, physiological status, the presence of dependent young, population density, floristic composition of the forest, topography, and degree of disturbance by factors such as logging, hunting, habitat fragmentation, and fire.

Intelligence
Orang-utans use a sophisticated array of tools for gathering food. One female orang-utan was recording using 54 tools for hunting insects and 20 tools for fruit - each tool having been custom-made for a particular task. Differences in tool use and other cultural aspects of behaviour have been identified between various study sites.

3 CONSERVATION STATUS AND LEGAL PROTECTION

3.1 IUCN 2000 Red List status and CITES listing

Both species of orang-utan are threatened with extinction. The Bornean orang-utan is listed as endangered by the IUCN 2000 Red List of Threatened Species, and the Sumatran orang-utan is listed as Critically Endangered. Due to their endangered status, international trade in orang-utans was prohibited by their listing on 1st July 1975 on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). All the orang-utan range countries (Indonesia, Malaysia and also Brunei) are signatories to CITES.

3.2 Legal protection in the range states

In additional to international protection, orang-utans are protected by legislation at the national level in all three range states.

Indonesia
Protection of primates in Indonesia began with the prohibition of hunting and killing certain species by Ordinance in 1925, when the country was still under a colonial government. In 1931 and 1932 this Ordinance was expanded to make it illegal to catch alive, to disturb, to trade alive or dead, or to hold certain species of primate in captivity. The orang-utan was one of the first species to be included.

Article 21(2) of the Act of the Republic of Indonesia No. 5 Concerning the Conservation of Natural Resources and their Ecosystems (known widely as Undang-Undang No 5 Tahun 1990) states that:
"Any and all persons are prohibited to:
a. Catch, injure, care for, transport, and trade in a protected animal in a live condition
b. Keep, possess, care for, transport, and trade in a protected animal in a dead condition
c. Transfer a protected animal from one place to another, within or outside Indonesia.
d. Trade, keep or possess skin, bodies, or other parts of a protected animal or the goods made of parts of the animal, or transfer from one place in Indonesia to another, within or outside Indonesia"

The penalties that can be imposed when these laws are broken can total fines of up to IDR 100,000,000 (~USD 11,000) and imprisonment for up to five years.

The only exceptions to these rules are stated under Article 22:
(1) Any exception from the prohibition pertaining to Article 21 can only be permitted for purposes of research, science, and/or safeguarding those plants or animals
(2) Safeguarding efforts pertaining to paragraph (1) shall include delivering or exchanging a plant or animal species with foreign institutions, with permit from the Government.
(3) An exception to the prohibition to catch, to injure, or to kill a protected animal can only be permitted in case the animal endangers human life.

Malaysia.
In Sabah, the orang-utan is categorized as 'Totally Protected' and is listed in Part I of Schedule 1 of the Sabah Wildlife Conservation Enactment 1997. This Enactment states:
"No person shall hunt any animal of a species listed in Part I of Schedule I."
"Any person who hunts a species in Part I of Schedule I shall be liable to a term of imprisonment for not less than six months but not exceeding five years"
and

“No person shall possess any animal of a species listed in Part I Schedule I or an animal product of an animal listed in Part I Schedule I unless authorised in writing by the Minister acting on the advice of the Director”
“Any person who possess any animal of a species listed in Part I Schedule I or an animal product of an animal listed in Part I Schedule I shall be liable to a fine of fifty thousand Ringgit (~USD 13,000) or to imprisonment for five years or to both.”

In Sarawak the orang-utan is is listed as a ‘Totally Protected Animal’ under the Sarawak Wildlife Protection Ordinance 1998. The Wildlife Ordinance states that:
"Any person who hunts, kills, captures, sells, offers for sale or claims to be offering for sale, imports, exports, or is in possession of, any Totally Protected animal or any recognizable part or derivative thereof, except in accordance with the permission in writing of the Controller for scientific or educational purposes or for the protection and conservation of such protected animal, shall be guilty of an offence."
The penalty for contravention of this Ordinance if the Totally Protected species concerned is an orang-utan is imprisonment for two years and a fine of MYR 30,000 (~USD 7,900)

Brunei.
Although it is likely that there are no resident populations of orang-utans in Brunei, wandering orang-utans are occasionally encountered in the country. There is legal protection for orang-utans in Brunei under: "Laws of Brunei, revised edition 1984, chapter 102, wildlife protection". The orang-utan is classified as a protected animal, and the law states that, "no person shall hunt, kill or capture any protected animal otherwise than under the accordance with the conditions of a license issued under this act: Penalty, imprisonment for one year and a fine of $2000."

4. KEY CHALLENGES TO ORANG-UTAN CONSERVATION

With the growing pressure of large-scale logging, permanent land conversion and forest fires, the loss and degradation of orang-utan habitat is now probably the most significant threat to its survival. In addition, the orang-utan is still threatened by poaching for trade or due to conflicts with humans, and the situation is aggravated further by the lack of resources and commitment to develop, implement and enforce environmental policy and regulations that will benefit the conservation or orang-utans throughout their remaining range.

4.1 Habitat loss and habitat fragmentation

In the 1960s, the majority of both Borneo and Sumatra was still covered by rainforest and orang-utans were known to inhabit large areas in lowland dipterocarp, freshwater and peat swamp forest. In the last 30 years however, much of this forest area has been cleared to fuel the development of two of the fastest growing economies in the world - Malaysia and Indonesia - and to accommodate their expanding human populations. Prime orang-utan habitat continues to be lost and degraded at extremely high rates in order to meet the demands of forestry, agriculture and infrastructure development.

There has been a dramatic increase in the amount of land that has been converted into oil palm plantations in both Malaysia and Indonesia. Approximately 30,000 km^2 of land in Malaysia is used to produce this crop, and one third of these plantations are in the state of Sabah. Sabah lost nearly 90% of its primary lowland forest between 1975 and 1995, taking the forest area from 28,000 km^2 to 3,000 km^2 in these two decades alone. The area of oil palm plantations in Indonesia has increased from 1,060 km^2 in 1967 to approximately 41,000 km^2 in 2002 and Indonesia is committed to expanding this industry. The peat swamp forests of Central Kalimantan have been identified as one of the most important habitats for orang-utans, yet around 10,000 km^2 of this area was destroyed between 1995 and 1997 to allow for rice cultivation.

Over the last 30 years, commercial logging has contributed to the destruction of nearly 40% of Indonesia’s natural tropical rainforest, and today only 950,000 km^2 of forest remains. The annual deforestation rate is around 1.5%, and thus Indonesia is currently losing an average of 20,000 km^2 of forest per year. Currey et al. (2001) have estimated that over half of the global timber trade derives from illegal sources, and that more

than 80% of Indonesian timber exports may be from illegal sources. Illegal logging currently occurs in most if not all of the key protected areas for orang-utan conservation in Indonesia. WWF has had some success in decreasing illegal logging for the pulp industry in Sumatra by encouraging timber buyers to reject illegal timber. Given the magnitude of the timber trade chains, the wider WWF network is well placed to play a key role in positively influencing the timber market in this way. Logging has a disproportionately detrimental effect on rainforest ecosystems as it not only directly destroys forest habitats, but also increases the likelihood that forest fires will occur. As logging increases in Borneo and Sumatra, fires are becoming an increasingly significant problem. The rampant forest fires of 1997 and 1998 destroyed an area of almost 50,000 km^2 in Indonesia.

The status of the remaining forest areas on Borneo and Sumatra that still contain orang-utans is particularly grim. In Sumatra, there are 13 identified orang-utan populations covering an area of 26,000 km², but only seven of these are considered to be viable in the long term (ie. have populations of 250 or more individuals.) The habitat of six of these seven populations is being logged at a rate of 10-15% per year. The situation in Kalimantan is similar - at least 39% of orang-utan habitat vanished between 1992 and 2002. The remaining forest is largely degraded, especially in East and Central Kalimantan where only 22% and 11% respectively is still undisturbed forest. The situation is slightly better in West Kalimantan where approximately 43% of the remaining orang-utan habitat consists of primary forest. It is considered that Borneo in total contains an area of around 100,000 km² of orang-utan habitat, but this remaining forest is becoming increasingly fragmented. For instance, 148 of the currently recognised 306 orang-utan habitat units in Kalimantan are smaller than 100 km². These smaller units contain very small orang-utan populations which are extremely vulnerable to loss of genetic diversity and localised extirpation. It is estimated that some orang-utan habitat units in Kalimantan are losing habitat at a rate as high as 20% per year. Therefore, it can be considered that at present, loss and fragmentation of orang-utan habitat is the main threat to successful orang-utan conservation, and urgent actions must be taken to mitigate this threat if the orang-utan is to survive, even in the short term.

4.2 Poaching and illegal trade

Despite the legal protection afforded to orang-utans in Malaysia and Indonesia which makes the intentional killing of orang-utans illegal (see section 3), orang-utans are still threatened by illegal take throughout their range.

The hunting of orang-utans for meat consumption and medicinal purposes is often perceived as a minor and scattered problem. However hunting was the causal factor behind local extinctions orang-utan populations in several parts of Sabah, and is also thought to have been responsible for local extinctions in parts of Sarawak and Kalimantan (Rijksen & Meijaard, 1999.) After the elimination of headhunting in Borneo, some communities hunted orang-utans for trophies to replace the cultural significance of human skulls.

The killing of orang-utans by local communities when they stray into agricultural land has become a more significant problem in recent times, particularly after the hugely destructive forest fires of 1997 and 1998 in Kalmimantan. Increasing amounts of forest are being converted to agriculture, and orang-utans often venture into these agricultural areas looking for food, particularly during times of environmental stress. The limited capacity of government agencies to retrieve such animals has created a temptation for farmers to deal with the situation themselves by killing the animals or capturing them for the pet trade. Orang-utans that are killed for these reasons may be eaten, however in general orang-utans occur at such low densities and have such low recruitment rates that they couldn't make up a significant proportion of the protein needs for local human communities.

An additional threat to orang-utan conservation which became evident in the middle of the 20th century is the removal of live animals from the wild for either the pet industry, or the entertainment and tourism industry. Performing orang-utans are very popular in Southeast Asia, and the physical similarities between baby orang-utans and human infants increases their appeal as pets. Former key trade destinations for live orang-utans such as Taiwan were closed in the 1990s. However, new markets such as Thailand and Indonesia have emerged more recently and their demand for live orang-utans poses a constant threat to the survival of this species. In order to capture a single young orang-utan, the mother and anything up to five more orang-utans

may be killed. The industry is therefore especially damaging to wild orang-utan populations as the mortality is focussed on adult females. This kind of mortality has a dramatic effect on a species with a reproductive rate as slow as the orang-utan, and also affects the demography and age structure of the orang-utan population.

WWF/TRAFFIC observations indicate an increase in baby orang-utan trade over the last ten years, which is perhaps a response to the economic crisis in Indonesia. A recent TRAFFIC survey on the Indonesian islands of Java and Bali indicated that the total annual losses to the wild populations of Bornean orang-utans as a result of orang-utan trade on Java and Bali alone may be more than one per cent of the total wild population (Nijman, 2005.) There is a pressing need for more stringent law enforcement and the implementation of effective penalties for those who trade in orang-utans. Unfortunately, even when confiscations occur, only a small proportion of the offenders (<10%) is sentenced and the prison terms and fines that result from the prosecutions are relatively lenient, well below the maximum allowed under the existing legislation (Nijman, 2005.)

It is important to note that wildlife trade is often interwoven in other illegal businesses, such as the illegal timber trade, and can be considered a by-product of destructive operations such as forest conversion. When orang-utans move through the trade chain from capturer to dealer, prices rise from around US$60-80 to thousands of US dollars per animal. The fees paid for orang-utans near the capturing site are often ten times lower than that offered in markets on Java or Bali, let alone abroad.

Poaching and the removal of live individuals occurs particularly in areas where orang-utans have traditionally been hunted and in areas where there has been a recent increase in the accessibility of the forest (for example through the construction of logging roads). The impacts of hunting are most severe in lower quality habitat, as the potential growth rate of orang-utan populations in these areas is low or even negative. Due to the naturally slow reproductive rate of orang-utans, hunting rates as low as 1% per year could destabilize and threaten the persistence even of large populations, and even in the best habitats orang-utans cannot compensate for hunting rates of more than 2%. This extremely low tolerance for non-natural mortality combined with increasing rates of hunting and/or live removal, make poaching and illegal trade of orang-utans the second most significant threat to the survival of orang-utans after habitat loss.

4.3 Lack of orang-utan compatible policy in government and industry

The protected area network throughout orang-utan range, particularly on Borneo, contains a large amount of mountainous habitat which is critical for the protection of water catchments but is of limited value for orang-utan conservation, and currently just 17% of orang-utan range itself is protected. In Sabah for instance, more then 60% of the total orang-utan population occurs outside protected areas and the situation in Indonesia is similar. Furthermore, some existing reserves are too small to ensure the viability of orang-utan populations in the long-term, and many are subject to at least some degree of encroachment leading to illegal logging and/or poaching. Improving the enforcement and effective management of protected areas, and increasing the area of land under protection, are important strategies that need to be addressed to ensure the survival of the orang-utan in the wild.

However the lack of protected orang-utan habitat means that successful conservation of orang-utans will also require effective management of non-protected areas, for which strict protection that will produce few direct economic returns is unlikely to be a realistic option. Conservation of orang-utans is a multi-faceted and complex issue which requires compromises between conservation goals on the one hand and the livelihood demands of local stakeholders on the other. Millions of people live in, and subsist from, land that is, or was until recently, orang-utan habitat. Rapid large-scale losses of habitat through irrigation dams or plantations catch public attention, but significant habitat loss also occurs through a long series of minor land use decisions that are made daily. Unfortunately, existing land use policies do not specifically include provisions that promote economic development that is compatible with orang-utan conservation. For example, there is good evidence that orang-utans may survive in selectively logged and secondary forests. Therefore concerted policy interventions are of critical importance to promote sustainable forest management as an alternative to converting forests to industrial tree plantations, palm oil plantations or any other form of use that is incompatible with the survival of orang-utans.

5. RESPONSE – CONSERVATION IN ACTION

5.1 Previous steps in orang-utan conservation

Information from studies by MacKinnon (1971, 1974), Rijksen (1975), Galdikas (1975), Rodman (1973), Sugardjito (1986), Van Schaik and co-workers (Van Schaik et al. 2003, Delgado & van Schaik, 2000; Singleton & Van Schaik, 2001, 2002) amongst others, led to an understanding of the broad features of orang-utan ecology, and contributed to the establishment and management of protected areas such as Gunung Leuser National Park, Danum Valley Conservation Area, and Tanjung Puting National Park. Surveys have been conducted in almost all the major forest areas containing orang-utans and as such base-line data exists for most of these populations. Early in the 1990s, it was recognized among leading orang-utan experts that there was an urgent need to develop and implement an orang-utan conservation strategy. Therefore, the IUCN's Conservation Breeding Specialist Group conducted a Population and Habitat Viability Assessment (PHVA) workshop in 1993 (Tilson et al, 1993). This workshop was repeated in 2004 to re-assess the status of orang-utan habitats and populations and to model the species' prospects for the future (Singleton et al., 2004).

Throughout the 1970s, several orang-utan rehabilitation centres were set up, at Sepilok (Sabah), Semenggoh (Sarawak), Bohorok (North Sumatra), Tanjung Puting (South Kalimantan), and in the 1990s at Wanariset (East Kalimantan). There has been prolonged discussion about the role and success of these centres. In particular, there has been great debate on the need for developing adequate monitoring of rehabilitated orang-utans that have been released back into the wild. While acknowledging the important role that these rehabilitation centres have played in creating awareness and support for orang-utan conservation, and recognizing their importance in rehabilitating ex-captive animals, it is considered that at least in some instances it has diverted attention away from the conservation of orang-utans within their natural habitat. More recently however, there has been a shift in the role of rehabilitation centres, and many are now paying increasing attention to the preservation of forest areas. Although rehabilitation does not directly address the root causes of the threats to orang-utan survival (i.e. habitat destruction/degradation and direct persecution,) it remains a necessary facet of orang-utan conservation efforts. In 1990, a revised approach to rehabilitation was developed, called 'reintroduction' to differentiate it from outdated rehabilitation approaches. Reintroduction was designed to avoid most of the problems associated with the traditional rehabilitation method and follows a set of specific criteria.

In addition to the research projects and the rehabilitation centres mentioned above, many related activities have been carried out such as education and awareness programs in rural and urban areas. The National Park and Wildlife Division in Sarawak has set up a system of honorary wildlife rangers to act as an extension of the department's monitoring and enforcement activities. If the project is a success, it would be worthwhile to investigate whether the scheme could be replicated in other areas. A similar approach has been successfully implemented by the Kinabatangan Orang-utan Conservation Project in Sabah.

5.2 Scaling-up to save orang-utans

It is crucial to develop a meaningful and significant conservation strategy for orang-utans that will ensure the survival of the species over the long term. However many of the recognized orang-utan habitat units in Malaysia and particularly in Indonesia contain very small populations of orang-utans which are genetically isolated from each other. Although conserving some of these orang-utan populations is technically possible, it offers little hope for their long-term viability due to inbreeding and its associated effects.

WWF therefore recognizes the need to 'scale-up' efforts from a focus on individual populations to the overall conservation of entire orang-utan landscapes. An orang-utan landscape is a group of orang-utan populations or key areas of orang-utan habitat that are or can be linked together to form a meta-population of connected populations that is genetically stable in the long term. Within the landscape, a variety of management approaches would be used. A landscape may include a patchwork of protected areas, managed areas which are not formally protected, and corridors. Landscape level conservation incorporates the

presence and participation of communities, governments and industries in the mitigation of key threats and the implementation of sustainable landscape management in a way which benefits both human communities and orang-utan survival and recovery.

5.3 Focusing effort

A key underlying principle of this Orang-utan Species Action Plan is the acknowledgement that the resources for orang-utan conservation that are available within WWF and other conservation organizations are finite. Therefore, in order to ensure tangible on-the-ground improvements for orang-utans in the wild, it is essential that conservation efforts are focused, and indeed limited to some extent, to places where they will be most valuable in the long-term. The careful focusing of WWF's activities in particular is also crucial to avoid duplication of effort with other organisations. Bearing this in mind, this strategy highlights four orang-utan priority landscapes where WWF's conservation efforts over the next 10 years should be focussed.

These priority landscapes were chosen through a process which assessed the appropriateness of various landscapes based on two tiers of criteria:
First tier criteria:

- Has this area historically supported high densities of orang-utans?
- Is the population in this landscape viable in the long term?
- Does the landscape overlap with other flagship or keystone species?
- Is the landscape within a Global 200[2] ecoregion and is the ecoregion a priority for the Asia-Pacific Programme?
- Is the long term retention of all/most of the forest in the landscape a possibility?
- Are there other threats in the landscape such as poaching and political instability?

Second tier criteria:

- Is there existing WWF involvement and ongoing assistance in the landscape?
- Can WWF add value to other conservation work that is already under way in the landscape?
- Does WWF have the capacity to implement a project in the landscape?
- Is there the potential to form partnerships with other NGOs and governmental organizations that are working in this landscape?
- Is there potential to catalyse important conservation action in the landscape?
- Is WWF's presence in the landscape sustainable in the long term?
- What contribution to achieving real conservation outcomes would WWF involvement in this landscape make?
- What contribution to the overall policy context of orang-utan conservation, and to the wider WWF policy agenda, would WWF involvement in this landscape make?

A table detailing how each landscape fared in relation to the above criteria is included in **Appendix III.**

As is evident from the above criteria, the role of partners and players other than WWF in a landscape must be strongly considered when assessing the appropriateness of WWF involvement. WWF may not always play the leading role, and may take a much smaller but focused role depending on what is required and on the other stakeholders that are present. It was therefore decided not to prioritise any landscapes in Sumatra for WWF action, as Conservation International focuses its attention on the conservation of the Sumatran orang-utan and its habitat, and this area has also received significant funding from the European Union. This by no means indicates that the Sumatran orang-utan is of lesser conservation significance. As stated earlier, it is in fact the most endangered species of orang-utan. It simply means that by prioritising WWF resources and efforts to those areas that are not currently covered by another other party, the best cumulative conservation gain by all parties involved in the conservation of orang-utans and their habitats will be achieved.

[2] The Global 200 portfolio is a list of ecoregions that are of global conservation significance

This Species Action Plan therefore identifies four priority orang-utan landscapes where WWF, in conjunction with governments, local communities, industry, other non-governmental organizations, economic parties and international conservation partners, stands the best chances of achieving meaningful, long-term results for orang-utan conservation. The four priority orang-utan landscapes will cover approximately 45,000 km^2 and are estimated to contain around 24,530 – 28,700 orang-utans in total, which is about one half of all orang-utans on the island of Borneo. This Species Action Plan will focus on the priority orang-utan landscapes but will also embody cross-cutting issues such as trade and land use policy that will affect important orang-utan habitat both within and beyond the priority orang-utan landscapes.

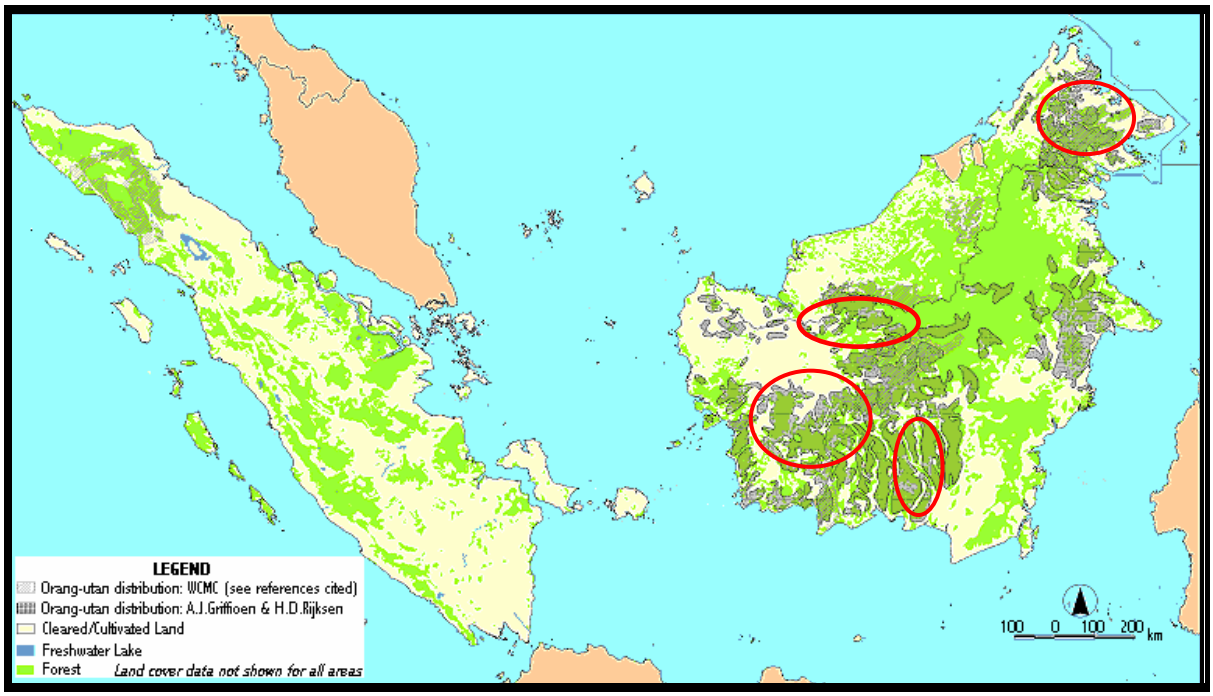
The four priority orang-utan landscapes are:

1) Betung Kerihun / Danau Sentarum, West Kalimantan, Indonesia
2) Sebangau, Central Kalimantan, Indoneisa
3) Kinabatangan and Segama River catchments, Sabah, Malaysia
4) Arut/Belantikan - Bukit Rongga/Perai forest, cross-border of West and Central Kalimantan provinces, Indonesia

The four priority landscapes cover all the three sub-species of Borneon orangutan i.e. *Pongo pygmaeus pygmaeus* (in West Kalimantan), *P. pygmaeus wurmbii* (in West/Central Kalimantan) and *P. pygmaeus morio* (Sabah).Three of the four sites already have existing WWF field projects and are protected to some extent.

The PHVA meeting in January 2004 considered the fourth site (Arut/Belantikan - Bukit Rongga/Parai) as an area of high conservation importance that was severely threatened and had lacked attention from conservation NGOs to date. The majority of the forest in this landscape has not been protected and may be soon converted to oil palm plantations.

Figure 1: The following map indicates where the four priority sites for support by WWF are roughly located. The base map shows the distribution of orangutans in relation to remaining habitat (after WCMC, 1997). The green areas represent forest cover and the dark grey areas represent orangutan distribution.



The above four priority orang-utan landscapes are those in which WWF is committed to supporting directly. Nevertheless there are many other places that are extremely important for the conservation of orang-utans, both within and outside of protected areas. In case of persistent impediments or changing circumstances in

the priority orang-utan landscapes, WWF has compiled a list of second tier priority landscapes. These are areas that should be noted as being of high conservation significance for orang-utans, and although concerted WWF interventions are not proposed for these areas at this time, WWF acknowledges the need for flexibility and rapid response, and commits to cooperate with governments as well as other agencies and organisations if work in these second tier landscapes becomes of critical importance over and above the commitments that have been made in the first tier priority landscapes. The degree of importance and urgency for each of these will change over time.

5 Leuser ecosystem, Sumatra, Indonesia
6 Lanjak-Entimau / Batang Ai, Sarawak, Malaysia
7 Tanjung Puting National Park and surrounding areas, Central Kalimantan, Indonesia
8 Gunung Palung National Park, West Kalimantan, Indonesia
9 Kutai National Park. East Kalimantan, Indonesia
10 Berau, East Kalimantan, Indonesia

5.4 Vision of the future – goals for today

WWF's strategy is aligned behind and based on the following vision and goals:

VISION:

A world in which the orang-utan thrives in natural habitats across its range, in harmony with people.

The long-term **GOAL** (over 10 years) for the orang-utan is:

To secure viable populations of Bornean and Sumatran orang-utans

To address this goal, this Species Action Plan outlines a series of Objectives that are measurable and timebound, and come with a set of indicators which provide a measurement of progress along the way to achieving each Objective.

The Objectives fit into five overall Categories addressing the five overarching themes of policy and legislation; protection, management and restoration of critical habitats; management and protection of populations; incentives for co-existence; and awareness.

The first Category of Objective addresses the policy and development frameworks operational in important orang-utan habitats within but also beyond the priority orang-utan landscapes.

Category 1 Objective	**By 2010, legislation, regulation and land-use policies relevant to orang-utans are improved**

The second Category of Objective focuses on the conservation of orang-utan habitat in the priority landscapes.

Category 2 Objective	**Secure and well managed orang-utan habitat in the 4 priority landscapes by 2015**

The third Category of Objective focuses on the poaching and trading of orang-utans at local, domestic and international levels.

Category 3 Objective **Poaching and trade is no longer a threat to orang-utan populations by 2015**

The fourth Category of Objective focuses on generating the mutually beneficial incentives for the co-existence of people and orang-utans in the priority landscapes. It does this through the development of sustainable livelihood projects for communities living within the landscapes, and by reducing conflicts between humans and orang-utans.

Category 4 Objective **Incentives are created for the co-existence of people and orang-utans by 2010**

The fifth Category of Objective focuses on creating public support for orang-utan conservation, creating awareness of the threats to orang-utans and influencing attitudes and behaviour to benefit their mitigation.

Category 5 Objective **Public attitudes and behaviour supports the conservation of orang-utans by 2010**

A full list of the Objectives and their indicators is included in **Appendix II.** The Objectives include work at a full range of spatial levels (landscape level, national level and international level) to ensure effective protection of the identified priority landscapes, as well as the mitigation of overriding threats.

An additional cross-cutting issue that must be considered in the implementation of all of these targets is capacity building. Capacity building work should be an underlying principle that is considered in all of the activities outlined in this SAP, and should be built into all activities whenever possible. Technical and institutional training of staff that have to deal with orang-utans (for example, protected area staff, customs officials, etc.) should be undertaken, as well as transfer of existing technical and scientific knowledge between orang-utan range states.

6. PROGRAMME IMPLEMENTATION AND COORDINATION

Programme Implementation, coordination and networking is of great importance - be it at the field level for project design and implementation in consultation with various stakeholders, or at the National or International strategic level for ensuring maximum conservation impact and synergy with other efforts.

6.1 Co-ordination of Orang-utan SAP implementation

While implementation of the SAP remains the responsibility of each National Office, there should be clear communication and consideration of orang-utan priorities within the wider network, and feedback from the network on the implementation of the plan. This is essential to ensure the full potential of the wider WWF network is used to support, advise and add value to the implementation of the SAP, whether this be through the provision of advice, fundraising or active involvement of other offices (for example in policy work or by influencing consumer markets.)

The main, most immediate priority to ensure effective implementation of this plan is to secure dedicated capacity within the implementing offices (eg. WWF-Indonesia, WWF-Malaysia, TRAFFIC Southeast Asia) and effective and operational lines of communication between all involved network partners.

To facilitate co-operation and co-ordination throughout the wider WWF network, an internal WWF Orang-utan Advisory Group (WWF OUAG) will be established, comprising representation from the following: the implementing National Offices (Malaysia and Indonesia), TRAFFIC, the Global Species Programme, the Asia Pacific Regional Programme, interested donor offices, and relevant members of other Global Programmes such as the Forests Programme (for example, the Forest Conversion Initiative.) This group is not intended in any way to duplicate other orang-utan specialist/advisory groups (for example, the IUCN

primate specialist group) which engage multiple organisations and fulfil clearly identified roles, but is intended purely as a **WWF internal** group whose primary purpose is to;

- Ensure effective communication between relevant parties within the WWF network.
- Ensure that the wide range of resources available in the WWF network are mobilised to best possible advantage to support the implementation of this SAP (for example through "big win" concepts.)
- Ensure that there is harmonisation of conservation, communications and fundraising objectives, particularly between implementing and donor offices.

6.2 Monitoring and evaluation

Each part of this program will have a monitoring and evaluation plan, based on objectives and indicators against which progress can be assessed. Technical and financial progress reports will be delivered regularly in line with donor requirements. On a yearly basis, an overview and analysis of progress, based on the reports received from the field, will be produced and circulated to the donors, project leaders, partners, and other key people within and outside the WWF Network. Evaluations during the Program Period and review workshops will assess progress, highlight major issues and constraints, and provide recommendations for improvements.

6.3 Funding

Implementation of the Orang-utan SAP will require the acquisition of significant, long term funding, and the 'buy in' of the WWF network to the SAP is vital to ensure support from WWF donor offices. Linkages and alignment with Ecoregion Action Programmes, the AREAS programme and other relevant thematic programmes such as the Global Forests Programme will also be crucial to complement core orang-utan funding. There are also opportunities to obtain external funding for the implementation of this SAP. Tapping into these funding sources, both within and outside the WWF Network and including facilities such as the Global Environment Fund and the Great Ape Survival Programme (GrASP), will be a fundamental part of the implementation of the SAP.

In the long term, sustainable financing mechanisms for orang-utan conservation by range state governments are needed for more effective funding of orang-utan conservation. This is particularly the case in Indonesia, where the recent move towards increased local autonomy provides opportunities to ensure that local, regional and national governments take a greater responsibility for orang-utan conservation. This should include a higher prioritisation of orang-utan conservation actions within government agendas, as well as the provision of financial resources. Only when governmental agencies are more actively involved can we expect any serious achievements to be made.

Furthermore, the opportunity exists for central government to provide compensation for the 'non-use' of forests and forest resources to those administrative entities that have protected a relatively large part of their land area. At the moment there is no financial incentive for these regencies to actively protect the forest, and increasingly local governments are handing out small areas that were formally included in protected area networks for other (often non-sustainable) uses.

7. INTEGRATION OF THE ORANG-UTAN SPECIES ACTION PLAN WITH OTHER CONSERVATION EFFORTS

7.1 Alignment of the orang-utan Species Action Plan with WWF's Global Species Programme

The Orang-utan Species Action Plan (SAP) is fully aligned with the priorities of WWF's Global Species Programme, and thus the Orang-utan SAP will provide a globally significant contribution to WWF's species conservation efforts.

The first category of objective of the orang-utan SAP will deliver under several of the Global Species Programme milestones, in particular milestone 1.5 "*By 2007, use international instruments and institutions to*

catalyze species conservation action to benefit at least 6 landscapes or G200 ecoregions, or to mitigate at least 3 threats."

The second category of objective of the orang-utan SAP will deliver under Milestone 1.2 of the Global Species Programme: "*By 2007, critical habitat of priority species is protected, managed and/or restored in at least 20 G200 ecoregions or flagship species landscapes or seascapes*."

The third category of objective of the Orang-utan SAP will deliver under Target 2 of the Global Species Programme: "*By 2010, at least 10 priority species or species groups are no longer endangered by overexploitation*."

The fourth category of objective of the orang-utan SAP will deliver under Milestone 1.3 of the Global Species Programme: "*By 2007, reduce human/wildlife conflict and/or establish livelihood-based conservation initiatives in at least 10 G200 ecoregions or flagship species landscape or seascapes, that are designed to reduce threats to priority species."*

7.2 'One Global Programme' - ensuring mutually beneficial collaboration within the WWF network

Both Borneo and Sumatra are high priorities for several of WWF's Global Programmes, and co-ordination and collaboration between all programmes that are active in this area is essential.

WWF-Indonesia and WWF-Malaysia will collaborate on the Heart of Borneo Initiative, a broad sweep approach to the conservation of primarily upland forest in Borneo with special emphasis upon transboundary protected areas

The Heart of Borneo Initiative is taking the WWF 'Big Win' approach, and aims to achieve significant conservation impact over a short period of time through a concerted and sustained push for collaboration between all stakeholders resulting in significant conservation outcomes. Orang-utans generally inhabit lowland forest areas, whereas the focus of this initiative is the conservation of highland forest areas. However there is some overlap, and this initiative has the potential to make significant contributions to orang-utan conservation. At least two of the priority orang-utan landscapes defined in this SAP occur either fully or partially within the boundaries of the Heart of Borneo initiative. It is therefore important to maintain effective coordination and collaboration between this initiative and the implementation of the orang-utan SAP.

The Kinabatangan and Segama priority orang-utan landscape overlaps with one of the 13 global priority landscapes under WWF's Asian Rhino and Elephant Action Strategy (AREAS). The main threats to all three species (orang-utans, Asian rhinos, Asian elephants) are similar, particularly regarding loss and degradation of habitat. Therefore it is crucial for the Orang-utan SAP to effectively collaborate with the AREAS programme to ensure that conservation efforts for all species are synergistic and mutually beneficial. This landscape has therefore become a multi-species landscape, with conservation planning activities for all three species occurring simultaneously. Highlighting commonalties and facilitating communication between AREAS activities and orang-utan conservation work should allow for data exchange, mapping of critical areas for conservation interventions, and involvement of local people in methods of mitigating conflicts with wildlife.

In all four priority orang-utan landscapes, linkages with WWF's Forest Programme and Freshwater Programme will be mutually valuable, and should be actively propagated.

7.3 Partnership outside the WWF network

Solid partnership and cooperation between all stakeholders is essential if the orang-utan is to survive - no one organisation, agency or community has the authority, resources, knowledge or outreach to succeed alone. There is a great deal of excellent work being done by other organisations that either directly or

indirectly benefits orang-utan conservation, and it is crucial the WWF's efforts are complementary to this work. Successful conservation of the orang-utan will call, as never before, on the ability of people and organizations to work together. The approach will require long-term commitments and synergy of knowledge, skills and resources to implement the diverse and complementary range of activities required. Concerted and continuous efforts must be made by all parties responsible for the implementation of this SAP to ensure that a collaborative and mutually beneficial relationship is maintained with all parties involved in orang-utan conservation.

Key organisations for collaboration include government agencies, international NGOs such as Conservation International and The Nature Conservancy, local NGOs such as Borneo Orang-utan Survival Foundation (BOS) and the Kinabatangan Orang-utan Conservation Project (KOCP) operated by the NGO 'HUTAN', and other individuals and organisations in Indonesia and Malaysia.

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Orang-utan Species Action Plan
Appendix I: Profiles of Priority Orang-utan Landscapes

Section 1 – WWF First Tier Priority Landscapes

1) Betung Kerihun / Danau Sentarum
Kalimantan, Indonesia
~8 300km^2

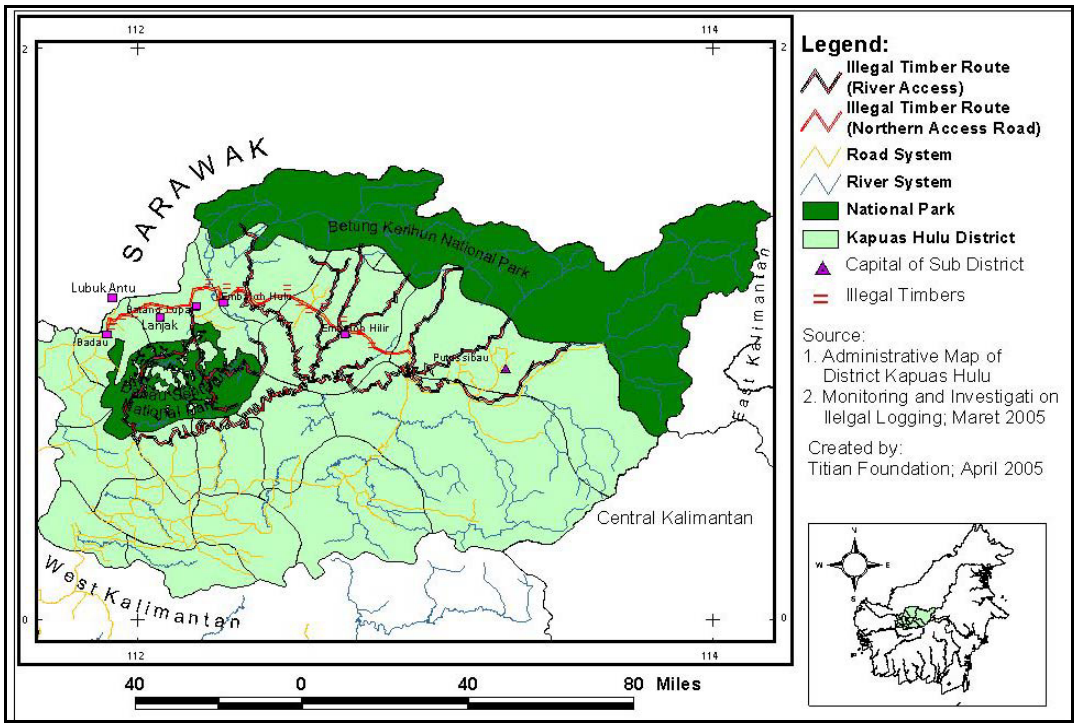
(i) Basic information
This area includes 2 protected areas:

- Betung Kerihun National Park – 8,000 km^2
- Danau Sentarum Wildlife Sanctuary – 2,000 km^2

Management of a wider area beyond the protected areas is required as some of the larger populations of orang-utans occur outside the protected area boundaries.

Although little is known about the distribution of orang-utans in Betung Kerihun, it is expected that the largest populations exist in the western part of the park. For Danau Sentarum, the most important habitats for orang-utans are situated to the eastern hills beyond the reserve, an area which is currently designated as production forest. Furthermore, Russon et al. (2001) indicated that important orang-utan habitat exists in the east, west and north. Given the pronounced seasonality of the area, orang-utans are thought to migrate back and forth to swamp forests outside the reserve.

Figure 2: Betung Kerihun and Danau Sentarum National Parks



(ii) Existing orang-utan population

Combined, these areas contain a significant population of *P. pygmaeus pygmaeus*, although not all parts of the landscape are used by orang-utans. The whole area contains around 1,830 - 3,000 individuals, which are distributed between the wider habitat units for each protected area as follows:

- Betung Kerihun: 1,330 - 2,000 orang-utans
- Danau Sentarum: 500 - 1,000 orang-utans

(iii) What are the key threats to this landscape?

- Illegal logging
- Poaching and trade
- Forest conservation, around the national parks

(iv) Previous and current work in this landscape

WWF-Indonesia has been working in the Betung Kerihun area with ITTO since the 1990's and has co-developed a long term strategy for Betung Kerihun which is now being implemented. Orang-utan conservation needs to be integrated explicitly in the current plans.

Historically, conservation efforts in this landscape have focused largely on protected area management. However opportunistic information appears to indicate that orang-utans traded in West Kalimantan and in Sarawak are being sourced from this landscape, highlighting the immediate need to tackle orang-utan poaching and trade issues in this area.

Integrated conservation actions to link Betung Kerihun and Danau Sentarum national parks, (and also to link with the Lanjak Entimau and Batang Ai area across the border in Sarawak – see second tier landscape number 6) are of considerable urgency as the whole wider forest area is under threat of conversion.

2) Sebangau

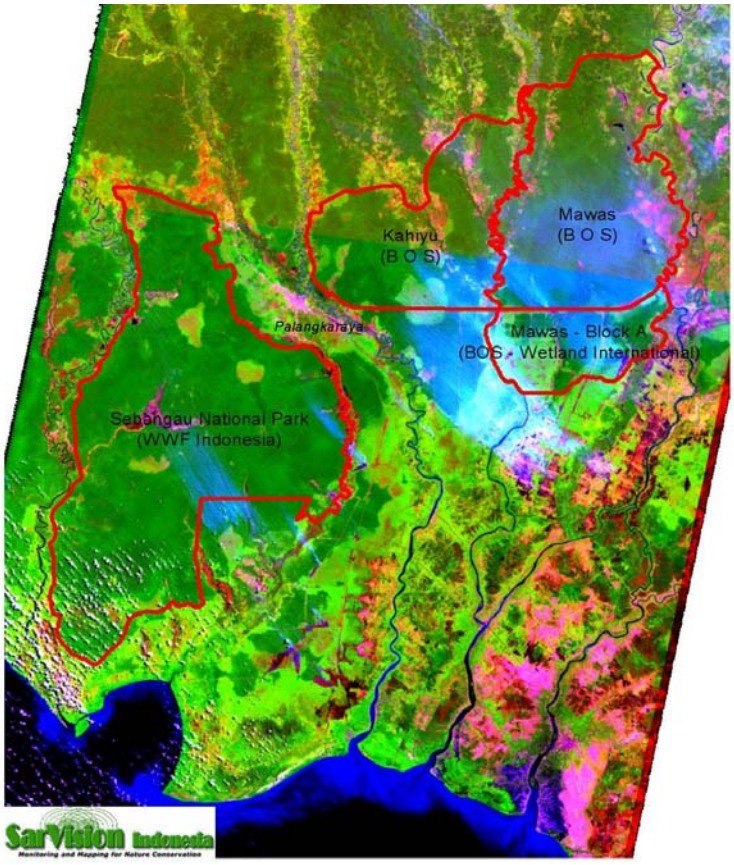
Central Kalimantan, Indonesia
5,780 km^2

(i) Basic information

The Sebangau river catchment area is part of a large peat-covered landscape between the Katingan River to the east and the Kahayan and Sebangau River to the west. Most of the area is covered with peat swamp forest although there has been some conversion for agriculture and human settlement, particularly near Palangkaraya and on the Paduran transmigrant settlement in the southeast part of the landscape.

The priority orang-utan landscape comprises Sebangau National Park, a new National Park created by the Indonesian government in 2004. There are however significant orang-utan populations outside the National park, such as in the Mawas area to the North East of Sebangau National Park. Whilst these areas are not included in the orang-utan priority landscape, it is crucial that connectivity between Sebangau and these other important orang-utan populations is maintained, and WWF will continue to work closely with the organisations working in these areas.

Figure 3: Sebangau National Park and other other key areas of orang-utan habitat



(ii) Existing orang-utan population

Sebangau holds perhaps the largest orang-utan population in Central Kalimantan, which has been estimated at some 6,900 individuals. It is one of the 13 top priority sites for orang-utan conservation identified at the international PHVA workshop held in Jakarta, January 2004.

Orang-utans are distributed continuously throughout the forested area of the Sebangau Ecosystem in Central Kalimantan. The only potential gaps in their distribution are in the interior low canopy forest.

Orang-utan densities vary from 1 to 3 individuals per square kilometre depending on habitat type and degree of disturbance. The highest densities are believed to occur in the riverine and transitional riverine-mixed swamp forest near to the Katingan and Bulan Rivers, and in the tall interior forest between the Sebangau and Bulan Rivers.

(iii) What are the key threats to this landscape?

- Illegal / destructive logging, with the associated construction of water canals which dries out the peat swamp habitat
- Forest fires
- Plantation development
- Orang-utan poaching and trade

The population has declined by approximately 50% over the past seven years. One third of this decline is attributed to habitat destruction by fire and forest clearances. The remainder is the result of habitat degredation caused by illegal logging which has killed many food trees, and a 'compression effect' which caused orangutans to overshoot the natural carrying capacity in several areas and directly led to a mass die-off of orangutans between 2000 and 2001.

(iv) Previous and current work in this landscape

In 2004, with WWF's facilitation, Sebangau was declared as a national park by the Indonesian government at the seventh Conference of the Parties to the Convention on Biological Diversity. It was gazetted by Ministry of Forestry of Republic of Indonesia through decree Nr. 423/Kpts-II/2004 dated on 24 October 2004. Efforts will now be focused on helping the park authority to effectively manage the area, and ensuring that the orang-utan population in Sebangau is well protected.

3) Kinabatangan and Segama River catchments

Sabah, Malaysia

Size: The Segama river catchment is 4,651 km^2 and the Kinabatangan river catchment covers 16,800 km^2. Therefore the total landscape covers 21,451 km^2. This is more than 25% of Sabah's land area (73,600 km^2.)

(i) Basic information

At 560 km in length, the Kinabatangan River ranks as Sabah's longest river. It flows from its source in the Maliau Basin to the mangrove swamps of the east coast where it enters the sea. The floodplain along the lower part of the Kinabatangan River and its surrounding rainforest wetlands make up a rich ecosystem that is home to rare and endangered animals such as the proboscis monkey, making it an increasingly sought after tourist destination. However much of the floodplain has now been converted to agriculture, squeezing wildlife into the ever smaller patches of remaining forest.

These two catchments are about 65% forested and contain the majority of the Sabah Foundation's forest concession, other forest management units, and a significant proportion (about one third) of all Sabah's oil palm production. The human population in the priority orang-utan area is small, culturally diverse, and mostly dependent on a combination of subsistence agriculture and the utilization of forest resources.

(ii) Existing orang-utan population

This landscape contains the main stronghold for the taxon *Pongo pygmaeus morio*, with approximately 9,700 orang-utans, almost 90% of Sabah's estimated population of 11,000 individuals (Ancrenaz et al, 2005). In the southern portion of the priority orang-utan landscape,

Sabah's remaining orang-utans are divided into five main wild breeding populations of orang-utans, as outlined below. The Segama Highland Forests and the Danum Valley Conservation Area alone (Segama-Kinabatangan South) contain about 4,500 orang-utans. This population is one of the largest unfragmented populations left in Borneo today. Furthermore, around 1,700 orang-utans live in the area north of the Upper Kinabatangan River (Kinabatangan North.) These two areas contain the most important orang-utan populations in Sabah for the long-term conservation of the species.

(A) SEGAMA-KINABATANGAN SOUTH
Location: In the middle to upper parts of the catchments of the Segama and Kinabatangan Rivers (south side of Kinabatangan River)
Extent of area: About 3,760 km^2.
Estimated size of orang-utan population: 4,500
Landform: Mainly low hill ranges and valleys with some rolling lowlands and steep hills.
Vegetation: Mainly logged lowland and hill dipterocarp forest, with virgin forest in Danum Valley (430 km^2).
Land status: Commercial Forest Reserve except for Danum Valley (Protection Forest Reserve)
Management authority: Sabah Foundation for commercial forests, a committee for Danum Valley.

(B) KINABATANGAN NORTH
Location: In the middle to upper part of the Kinabatangan River catchment, north side of Kinabatangan River.
Extent of area: About 1,500 km^2.
Estimated size of orang-utan population: 1,700

Landform: Mainly rolling lowlands with some local steep hills.
Vegetation: Logged lowland and hill dipterocarp forest
Land status: Commercial Forest Reserve (includes Deramakot Forest Reserve, certified under FSC principles and criteria)
Management authority: Sabah Forestry Department, but about 570 km^2 has been licensed to KTS (a private company) for 90 years.

(C) LOWER KINABATANGAN :
Location: Floodplain of Kinabatangan River, north and south sides.
Extent of area: About 400 km^2.
Estimated size of orang-utan population: 1,100
Landform: Mainly swamps and seasonal wetlands with some dry land, low hills and limestone outcrops.
Vegetation: Mainly heavily logged freshwater swamp forest and secondary growth
Land status: Wildlife Sanctuary (in 15 separate blocks), Protection Forest (8 blocks) and small areas of private land.
Management authority: Unclear for Wildlife Sanctuary but nominally Kinabatangan District Office; Sabah Forestry Department for Forest Reserves; land-owners for private land.

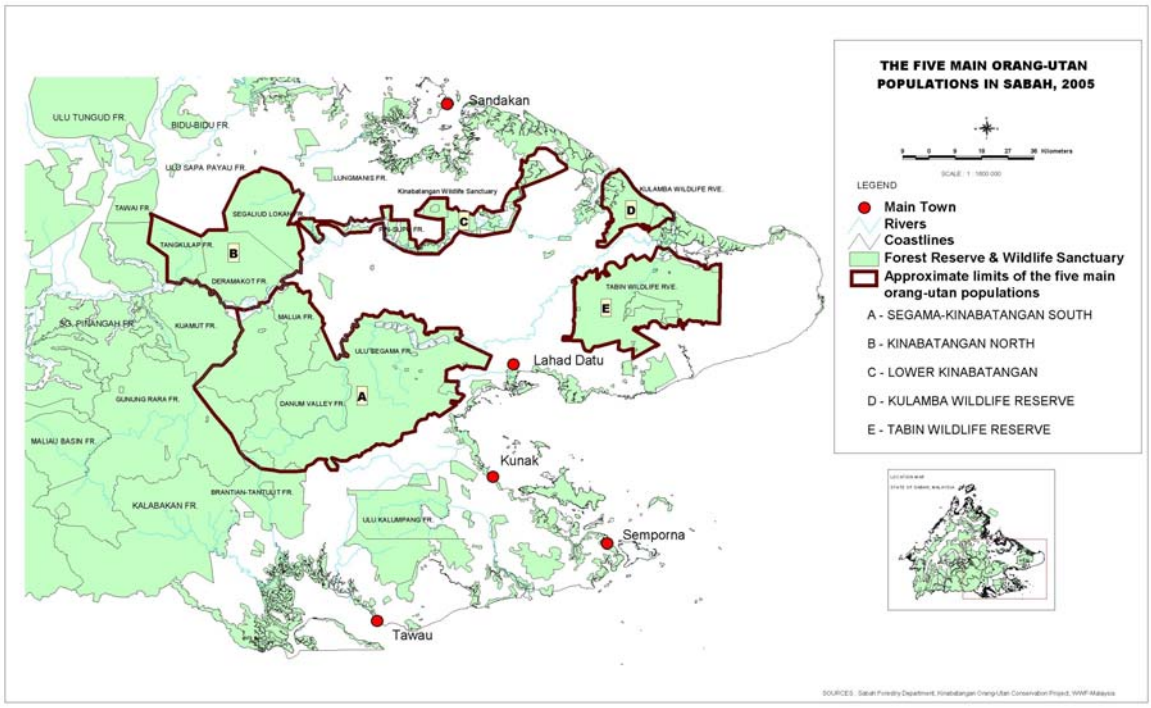
(D) KULAMBA WILDLIFE RESERVE :
Location: North coast of Dent Peninsula.
Extent of area: About 250 km^2.
Estimated size of orang-utan population: 500
Landform: Flat coastal swamps with patches of dry land.
Vegetation: Freshwater swamp forest, some burned or logged, with patches of dry land and nipa swamp
Land status: Wildlife Reserve, with small areas of State land and private land on west side
Management authority: Sabah Forestry Department.

(E) TABIN WILDLIFE RESERVE :
Location: Middle of Dent Peninsula, eastern Sabah.
Extent of area: About 1,240 km^2.
Estimated size of orang-utan population: 1,400 (more than 300 translocated in from sites elsewhere).
Landform: Low hills, flat land and some steep land and swamps.
Vegetation: Mainly logged lowland dipterocarp forest
Land status: Wildlife Reserve, with small areas of State land and private land on the north side.
Management authority: Management Committee, with Sabah Forestry and Wildlife Departments the key legal authorities.

A – D all lie within Segama and/or Kinabatangan catchments, although a small part of E lies outside.

There are a number of other forest areas with wild orang-utan populations in Sabah, but either the area of forest suitable for orang-utans is very small, or the orang-utan population itself is small (1-150 individuals), and therefore conservation actions for orang-utans in these areas are not recommended.

Figure 4: Orang-utan populations in Kinabatangan and Segama river catchments priority orang-utan landscape.



(iii) What are the key threats to this landscape?

- Breakdown of the forest management system

More than 60% of Sabah's orang-utans live in commercially exploited forests that are managed under Sustainable Forestry Management Licence Agreements (Ancrenaz & Lackman-Ancrenaz, 2004), and previous timber extraction under these agreements has left extremely low timber volumes in many of these forests. Companies are thus faced with the realization that they must invest substantially in forest enhancement (perhaps for up to 30 years) before they will be able to obtain additional profits from natural forest management. There is, therefore, a strong incentive to convert management of these forests to industrial timber extraction or even to convert the forest into agricultural crops such as oil palm that yield higher profits per unit area than natural forest management. Although orang-utans can survive relatively well in selectively logged forests, it is doubtful whether they would be able to withstand poor logging practices in the long-term. Furthermore, orang-utans cannot survive in industrial tree and oil palm plantations, and forest conversion to agriculture will inevitably lead to a general population decline.

- Fire

Human-induced fires have had tremendous economic impacts, particularly in years of drought. Logging increases the dry conditions in which fires prevail, thus exacerbating the problem. This can create a feedback loop of increasingly drier conditions leading to continuing degradation of the forest.

- Fragmentation

New roads, ribbon development, migration of forestry and agricultural workers, pressures for new land, and extended fires are likely to result in fragmentation of the existing large forest blocks into smaller segments.

- Conflicts with agriculture

Conflicts arise when orang-utans raid plantations for food, and plantation owners or laborers kill the animals in order to protect their crops.

(iv) Previous and current work in this landscape

WWF-Malaysia has promoted the conservation of this area since 1992 and has maintained active projects there for most of the period since then.

The Kinabatangan Wildlife Sanctuary is being created to protect one of Sabah's most splendid natural resources for future generations by linking mangrove areas near the coast with existing protected inland areas.

The Kinabatangan Orang-utan Conservation Project (KOCP), was set up in 1998 by Hutan, a French NGO dedicated to wildlife conservation, in collaboration with the Sabah Wildlife Department in the Kinabantagan floodplain. KOCP is partly financed by WWF. KOCP and other partners (University Malaysia Sabah, Cardiff University) are currently investigating to what extent orang-utan densities are artificially high because of surrounding forest loss, whether the current high densities will be maintained, and what the carrying capacity of the system is. Addressing the issue of how orang-utans may adapt to significant changes in their natural habitat is a crucial step in the identification of efficient methods of enhancing their prospects of long-term survival. The existing initiatives will all play a role in scaling up and magnifying work for the whole catchment area.

4) Arut-Belantikan and Bukit Rongga-Parai, West and Central Kalimantan, Indonesia

Size: 9,300 km^2. 4,200 km^2 in Bukit Rongga and Parai, and 5,100 km^2 in Arut Belantikan.

(i) Basic information

The orang-utan PHVA meeting in January 2004 ranked this landscape as a top priority for conservation action. The landscape contains a relatively intact forest area extending almost 10,000 km^2 and a large population of orang-utans, yet no NGOs have invested sufficient resources in the area to date.

Arut-Belantikan forest is situated in Central Kalimantan, and Bukit Rongga-Parai in West Kalimantan (south of Kapuas River). Most of the forest in this landscape is categorized as production forest, and is thus totally unprotected. A small proportion of the landscape in West Kalimantan is protected, however the Central Kalimantan section of the landscape, which contains the most extensive forest area, is totally unprotected and under immediate threat of conversion. A WWF aerial and ground survey of the landscape reported that sightings of orang-utan nests were common even areas that were not primary forest.

(ii) Existing orang-utan population

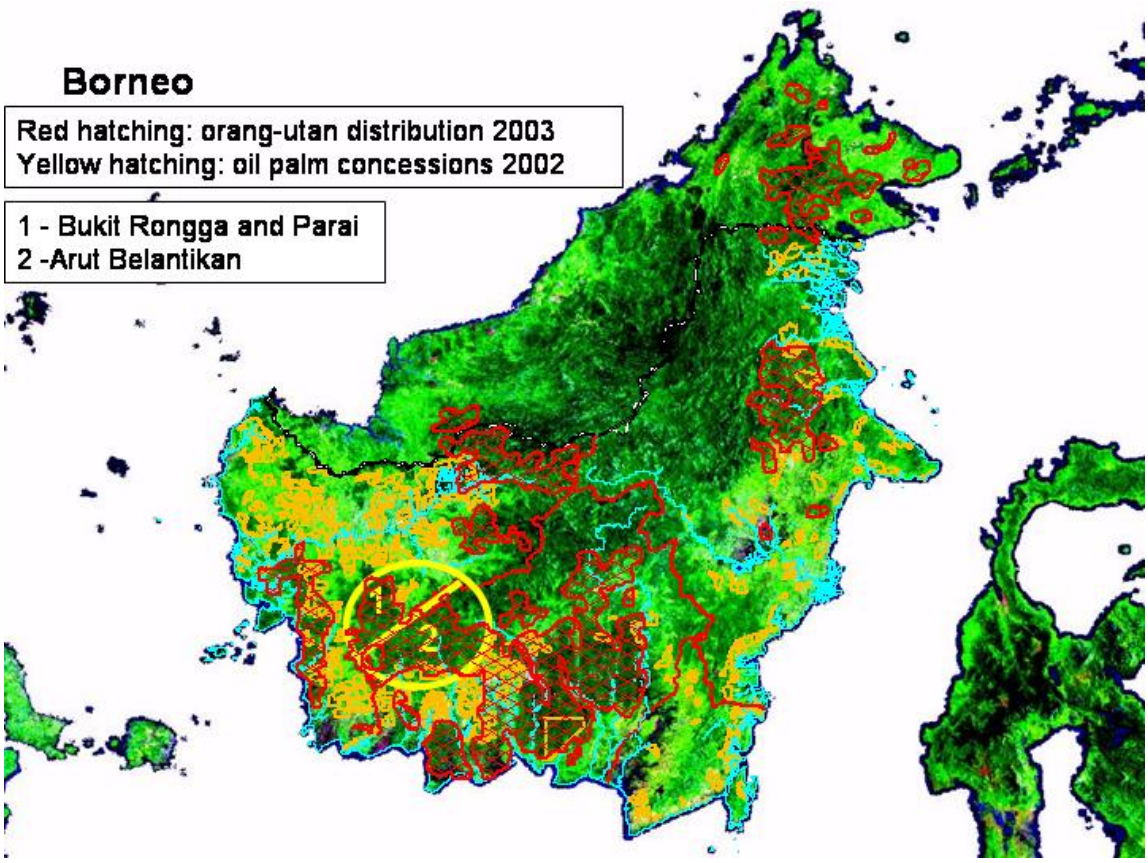
7,000 orang-utans, 1,000 in Bukit Rongga and Parai, and 6,000 in Arut Belantikan.

(iii) What are the key threats to this landscape?

The section of the landscape in West Kalimantan (Bukit Rongga and Parai) borders directly onto logging concessions which contain a large number of logging roads. In the places where the roads penetrate the forest, illegal logging often occurs and as there is no effective protection on the ground, this forest is an easy target. Once the forest has been degraded by either illegal or legal logging, it is likely that proposals from investors to convert the forest into plantations will soon follow.

In the section of the landscape in Central Kalimantan (Arut Belantikan), the pressure to convert the forest into oil palm is severe. The eastern boundary of the landscape borders directly onto oil palm plantations which were identified as orang-utan sites in the early 1990s, but have since been converted into oil palm as the forest was not protected. The expansion of these oil palm plantations into the priority landscape area may be well engulf this whole side of the landscape (containing 6,000 orang-utans) unless immediate action is taken.

Figure 5: Arut Belantikan / Bukit Rongga and Parai landscape shown in relation to orang-utan distribution and oil palm plantations in Borneo. The encroachment of oil palm plantations around this priority landscape can be clearly seen.



Thanks to Michael Stuewe for original data layers.

(v) Previous and current work in this landscape
None

Section 2 – WWF Second Tier Priority Landscapes

5) Leuser ecosystem, Sumatra, Indonesia
The Leuser ecosystem was previously one of the most densely populated orang-utan habitats in the world, but the situation is deteriorating every year, mostly due to logging. Recent data presented by van Schaik et al. (2001), Wich et al. (2003), and the results of the 2004 PHVA (Singleton et al., 2004) paint a grim picture. Because of the value of this area as one of the last remaining strongholds for the critically endangered Sumatran orang-utan, this area is of crucial importance (see main SAP text for full explanation of why this landscape is not a first tier priority landscape).

With the current tsunami calamities in Aceh, there is concern that the need to reconstruct the area will accelerate illegal logging operations in Leuser. WWF-Indonesia is currently calculating what the timber requirements for the reconstruction effort in Aceh will be, and may soon propose alternative timber sourcing options.

6) Lanjak-Entimau / Batang Ai, Sarawak, Malaysia

Lanjak-Entimau in Sarawak, Malaysia lies just north-west of Betung Kerihun in Kalimantan, Indonesia, which is a WWF first tier priority landscape along with Danau Sentarum and the surrounding area (see priority landscape 1 above.)

Lanjak-Entimau Wildlife Santuary was established in 1983 mainly to protect the orang-utan and other fauna. With an area of 1,687 km^2, it is the largest totally protected area in Sarawak and the largest wildlife sanctuary in Malaysia. Most of the area is made up of relatively undisturbed primary hill dipterocarp forest, but also contains some patches of healthy forest and some old secondary forest. The area is characterised by rugged terrain ranging from 60 to 1,284 meters above sea level. Overall, Lanjak-Entimau is estimated to contain 1,100 orang-utans, and the most important populations are found in the southern section of the Sanctuary.

Lanjak-Entimau is contiguous with Batang Ai National Park to the South, which is also in Sarawak, Malaysia, and contains around 350 orang-utans. There is already tourism In Batang Ai, and in the long term it could be possible to develop ecotourism projects in other areas.

Both WWF-Malaysia and International Tropical Timber Organisation (ITTO) have been involved in conservation planning for Batang Ai and Lanjak-Entimau with the Sarawak State Government.

Combined, the Lanjak-Entimau / Batang Ai complex in Sarawak and Betung Kerihun in Kalimantan comprise one of nine global transboundary conservation areas currently funded by ITTO. The entire Lanjak-Entimau / Batang Ai / Betung Kerihun transboundary area covers a total of 11,000 km^2, and contains a significant population of orang-utans. WWF has no plans to begin a dedicated programme of work in the Lanjak-Entimau / Batang Ai landscape (i.e. upgrade the landscape to a "first tier" priority landscape), but collaborative transboundary management of this area will be a critical part of the planning for the Betung Kerihun / Danau Sentarum landscape.

7) Tanjung Puting National Park and surrounding areas, Central Kalimantan, Indonesia

Tanjung Puting National Park is located on the south-central coast of Borneo. It is approximately 4,000 km^2 of fresh water peat swamp, lowland dipterocarp forest and heath forest, three quarters of which is inhabited by orangutans. Approximately one-third to one-half of the park is degraded. Despite this, the park contains a large, viable population of orangutans, with recent estimates indicating that some 6,000 orangutans remain in the reserve (Singleton et al., 2004). An orang-utan rehabilitation project has brought international attention to the park, but it is possible that the rehabilitant orang-utans park may pose a threat to the resident wild population (e.g. by transmission of diseases).

The main threats to the orangutan population in the park include continuing degradation from illegal logging, mining, and forest fires. Illegal logging is the main threat, and this problem is extremely difficult to resolve due to the financial and political clout of the timber barons and syndicates. A presidential decree was issued in 2000 to stop illegal logging in Tanjung Putting and Gunung Leuser National Park in order to save orangutan habitat. National and International NGOs have been working for several years to combat illegal logging in this park, by investigating the problem and compiling evidence to use in advocacy and policy work.

WWF-Indonesia conducted a survey after the 1998 forest fires within the park and surrounding areas to ascertain the extent of the damage that occurred to orangutan habitat. The survey found that a number of orangutans were trapped in the thin forest along the Sekonyer River as a result of the fires, and the population now has a limited chance of survival.

8) Gunung Palung National Park, West Kalimantan, Indonesia

A large orangutan population is found in the southwestern part of the island of Borneo in Gunung Palung National Park and its surrounding forests. This is due to the great diversity of habitat at Gunung Palung, which allows the orangutan population to migrate between swamp, peat, lowland and montane forests to track different fruiting seasons. The Gunung Palung National Park covers 900 km^2 and contains lowland, submontane and montane forest, as well as peat swamp and freshwater swamp forest. Recent surveys found

that almost 2,500 orangutans still persist within the borders of the park. There is an multi-faceted orang-utan research project in the park maintained by Harvard University through the establishment of Cabang Panti Research Camp which is investigating orangutan reproduction, behavior, social organization and physiology within an ecological context.

The main threats to the orangutan population in the park are illegal logging and poaching. Curran et al. (2004) clearly demonstrated that over the course of the last 14 years there has been an expansive and accelerating deforestation in and around Gunung Palung National Park. Within the 10 km wide buffer strip surrounding the outer perimeter of the reserve, >70% of lowlands were deforested from 1988 to 2002 leaving less than 9% of forest in the buffer zone area. Deforestation in the buffer zone was primarily due to intensive logging by timber concessions, followed by the clear cutting of residual stands by oil palm plantations. Over the same time period, 38% of Gunung Palung National Park's lowland forests were deforested (Curren et al. 2004), and the deforestation accelerated rapidly after 1999, when much of the buffer zone was already deforested (Curren et al. 2004).

In order to promote law enforcement of and the protection of orang-utans and their habitat, Fauna and Flora International established the Orangutan Protection and Monitoring Unit in 2002. This patrol unit, which consists of rangers and local people, patrols regularly in the park to stop poaching and illegal logging. These patrols were mainly concentrated in the western part of the reserve (including the surroundings of the Cabang Panti research centre), and it is anticipated that in the near future operations will be extended to also include the eastern part of the reserve.

9) Kutai National Park. East Kalimantan, Indonesia

Kutai National Park was first established as a conservation area at the instigation of the Sultan of Kutai in the 1930's. In the late 1960's a large section of the reserve was given out as a timber concession, and the coastal lowlands were soon occupied by illegal settlers. At this time a highway connecting the city of Bontang in the south and the village of Sengatta in the north was established dissecting the coastal strip of the reserve. In the 1970's two large industrial complexes were established in the reserve and over 1,000 km^2 was degazetted (MacKinnon et al. 1994). These developments attracted thousands of people to the reserve and significant sections of the park were affected by illegal logging, poaching and conversion. This illegal logging continued into the 1980's and large parts of the reserve burned during the prolonged droughts of 1982-1983. These fires affected almost the entire eastern section of the park, and particularly the areas nearest to human settlements. At that time, large areas in the western and northwestern section of the park remained in tact, and were not affected either by logging or the fires.

In 1993 the population of orangutans in Kutai National Park was estimated at between 1,200 and 2,100 individuals (CBSG/SSC/IUCN 1993), but this has been considered a gross over-estimate of the real numbers (Rijksen & Meijaard, 1999). The orangutans were living largely in severely degraded habitat and it seems that the available habitat was too small to support the numbers that had been proposed. Although the forest fires affected large parts of the reserve, given enough time and proper protection (i.e. a complete absence of logging) these forests might recover to the point that they would once again be able to support a reasonably large orangutan population. However, management of the reserve was lax, logging and encroachment omnipresent and poaching rampant. In 1997-1998 the regenerating forest that had burned in 1982-1983 burned a second time, and almost all of the forests that had escaped the fires of 1982-1983 were affected by these fires. In all, an estimated 90-95% of the park burned at least once, seriously reducing the value of the area for orangutans (and other wildlife.) The official map of conservation areas in Indonesia states that the National Park is 1,986 km^2, but it is clear that large parts of this area are no longer forested.

There have been some indications that orang-utan populations cling on in the northern sections of the park. However it is evident that in order for the population in Kutai National Park to recover, the area needs to be protected from further degradation and the forest must be allowed to regenerate. Active protection from forest fires will be required.

10) Berau, East Kalimantan, Indonesia

Rijksen & Meijaard (1999) documented only limited reports of orangutans in the central part of the Berau district. The area was not considered to be important for orang-utan conservation, as most of the area has

been given over to logging concessions and the forests are inhabited by forest-dwelling gatherers (both Punan and Dayak.)

Recently however, a number of surveys have been conducted in two large timber concessions (500 km^2 and 900 km^2) which concluded that in both concessions, hardly any logging has taken place so far, and the area has not been affected by the forest fires that raged through large parts of East Kalimantan (Marshall, 2002). Orangutan densities were rather high in the smaller of the two concessions (~2 individuals per km^2) but rather low (<0.5 individuals per km^2) in the larger. The total population size of the area has been estimated at between 1,000 and 2,500 individuals. The lower densities observed in the larger of the two concessions are attributed to excessive traditional hunting (Marshall 2002). Given the remoteness of the area, the fact that there are few land-use conflicts with local people over the area and the willingness of the concessionaires to cooperate with conservation agencies (primarily TNC) chances of successful orangutan conservation are reasonable.

Orang-utan Species Action Plan
Appendix II: Orang-utan Species Action Plan logframe

This logframe is intended as a guide for action at the landscape, regional, national and international level. It is flexible, and should be interpreted to fit the needs of each particular circumstance. Some objectives will be relevant to a particular landscape or other planning level, others will not be, and the planning process should take this into account.

At the landscape level, in situations where the orang-utan priority landscape is also a priority landscape for another WWF Global Flagship Species, planning efforts should be combined to ensure the development of co-ordinated multi-species programmes of work.

At this time, landscape level logframes based on this template have been produced for:

- Betung Kerihun / Danau Sentarum
- Sebangau
- Kinabatangan and Segama river catchments (combined logframe for orang-utans, rhinos and elephants)

Categories	Objectives	Indicators	Comments	Implementing 'team'
Category 1 objective: By 2010, legislation, regulation and land-use policies relevant to orang-utans are improved	1.1 National plan of action for orang-utans in place by 2006 and integrated into National forest policy by 2007	1.1.1 National action plan produced by 2006 1.1.2 National action plan approved by government by 2007 1.1.3 National action plan is integrated into forest policy by 2007		National organisations
	1.2 Investment policy and development plans demonstrate commitment to maintaining orang-utan habitat	1.2.1 Content of development plans demonstrates commitment to maintaining orang-utan habitat in relevant government bodies 1.2.2 Investment policy of relevant corporations or financial institutions demonstrates commitment to maintaining orang-utan habitat		Landscape teams (if development is proposed with a priority landscape), National organisations
	1.3 Detrimental procurement policies of resources in orang-utan habitats are mitigated by 2009	1.3.1 Major industries threatening important orang-utan habitat identified starting from 2005 1.3.2 Conservation of orang-utans is included in EIA guidelines of the industries by 2007 1.3.3 Compliance with EIA guidelines enforced by government by 2008	Foreign and domestic investment EIA: Environmental Impact Assessment	Landscape teams (if procurement policies relate to a priority landcape), National organisations
	1.4 Trans-boundary management in place within relevant priority landscapes by 2007	1.3.1 MY/ID or inter-provincial agreements signed by 2006 1.3.2 Joint implementation plans agreed by 2007 1.3.3 Government agency	'Boundary' here refers to both inter-provincial and international boundaries.	Landscape teams

		funding secured		
Category 2 Objective: Secure and well managed orang-utan habitat in the 4 priority landscapes by 2015	1.2 Effective and collaborative management of existing protected areas across all landscapes by 2009	1.1.1 Management plans written or revised and implemented 1.1.2 Community stakeholders identified and consulted on protected area management by 2006	Protected area management must include communities within and around protected areas	Landscape teams
	1.2 New protected areas are identified and established within the relevant priority landscapes by 2007	1.2.2 Boundaries of existing protected areas revised to include important orang-utan habitats by 2008 1.2.2 Consultation of relevant stakeholders undertaken by 2006 1.2.3 List of recommended protected areas produced and proposed to government by 2007 1.2.4 Protected areas established through official decree by 2007	This milestone will also deliver under objective 1.	Landscape teams
	1.3 Orang-utan habitats outside protected areas within the 4 priority landscapes secured by 2008	1.3.1 Logging concessions withdrawn or a moratoriums on logging established 1.3.2 Areas certified for selective logging and certified (FSC etc.) 1.3.3 Forest cover stable or increased against baseline data 1.3.4 Local agreements with communities on wise use of forest agreed	Actions under this milestone will centre around land use policy and will also deliver under objective 1.	Landscape teams
	1.4 Connectivity is achieved between core habitats in all 4 priority landscapes by 2010	1.4.1 Forest conversion plans for corridors between core habitats abolished by 2007 1.4.2 Land-use plans revised to ensure forest integrity in the corridors between core habitats by 2009 1.4.3 Forest management units in the corridors between core habitats apply for FSC certification by 2009 1.4.4 Restoration programmes in degraded areas of corridors between core habitats started by 2008		Landscape teams
Category 3 Objecctive: Poaching and trade is no longer a threat to orang-utan populations by 2015	3.1 Trend of illegal take of orang-utans is quantified (including identification of hotspots) by 2006 and reviewed by 2010.	3.1.1 Market monitoring system in place		TRAFFIC
	3.2 Establish effective anti-poaching units in core areas of the identified 4 priority landscapes by 2007	3.2.1 Enforcement effectiveness increased (quantity of units established, equipment, capacity building, time in the field etc.)		Landscape teams
	3.3 Increase enforcement in trade hotspots by 2008	3.3.1 Enforcement effectiveness increased (quantity of equipment,		TRAFFIC, landscape teams

		capacity building, confiscations / prosecutions)		(if hotspots occur within a priority landscape), National organisations
	3.4 Increase penalties for capturing and trading in orang-utans			
	3.5 Reduce demand for live orang-utan trade by 2009	3.5.1 Decrease in number of orang-utans owned privately	This refers to zoos circuses and shows as well.	TRAFFIC, National organisations
Category 4 Objective: Incentives are created for the co-existence of people and orang-utans by 2010	4.1 Pressure reduced on orang-utan habitats in the priority landscapes through sustainable livelihood projects by 2009	4.1.1 Pressure points identified and alternative livelihood options introduced 4.1.2 Biotic pressure measurably reduced in 'pressure point' areas.		Landscape teams
	4.2 The killing of orang-utans due to conflicts with humans is reduced within the priority landscapes by 2010	4.2.1 Human wildlife conflict mitigation models developed and distributed 4.2.2 Management guidelines for plantation owners, relating to orangutan conservation, are defined and adopted by at least three companies.		Landscape teams, National Offices
Category 5 Objective: Public attitudes and behaviour supports the conservation of orang-utans by 2010	5.1 Support raised for orang-utan conservation with key target audiences by 2010	5.1.1 Awareness raising and education activities addressing orang-utan conservation conducted in at least two provinces. 5.1.2 Teacher associations recommend that the implementation of teaching modules addressing orang-utan conservation are implemented in provinces where the orang-utan is found. 5.1.3 Awareness of impacts of pet trade on wild populations raised in the potential pet owning demographic with view to changing behaviour.		National Offices
	5.2 Public funds (from Indonesia and Malaysia) are raised to support orang-utan conservation	5.2.2 The orang-utan used as the mascot for the national game events in Indonesia. 5.2.2 Conservation awareness campaigns result in visible public support for the protection of orang-utan habitats		National Offices

Orang-utan Species Action Plan
Appendix III: Matrix of criteria for determining orang-utan priority landscapes

First tier criteria:

- Has this area historically supported high densities of orang-utans?
- Is the population in this landscape viable in the long term?
- Does the landscape overlap with other flagship or keystone species?
- Is the landscape within a Global 200[3] ecoregion and is the ecoregion a priority for the Asia-Pacific Programme?
- Is the long term retention of all/most of the forest in the landscape a possibility?
- Are there other threats in the landscape such as poaching and political instability?

	Historical high density	Viable population (>3000)	Overlap with other flagships	Overlap with Global 200 and EAP	Long-term forest retention prospects	Other threats
Kinabatangan / Segama	Yes	Yes	Elephant Rhino	Yes	High	Yes
Betung Kerihun / Danau Sentarum	Yes	Yes	No	Yes	High	Yes
Sebangau	Yes	Yes	No	Yes	Medium	Yes
Arut-Belantikan / Bukit Rongga-Parai	Yes	Yes	No	Yes	High	Yes
Leuser Ecosystem	Yes	Yes	Tiger Rhino	Yes	Medium	Yes
Tanjung Puting	Yes	Yes	No	Yes	Medium / Low	Yes
Gunung Palung	Yes	Yes	No	Yes	Medium / Low	Yes
Kutai	Yes	Possibly	No	Yes	Low	Yes
Berau	Yes	Possibly	No	Yes	Medium	Yes

[3] The Global 200 portfolio is a list of ecoregions that are of global conservation significance

Second tier criteria:

- Is there existing WWF involvement and ongoing assistance in the landscape?
- Can WWF add value to other conservation work that is already under way in the landscape?
- Does WWF have the capacity to implement a project in the landscape?
- Is there the potential to form partnerships with other NGOs and governmental organizations that are working in this landscape?
- Is there potential to catalyse important conservation action in the landscape?
- Is WWF's presence in the landscape sustainable in the long term?
- What contribution to achieving real conservation outcomes would WWF involvement in this landscape make?
- What contribution to the overall policy context of orang-utan conservation, and to the wider WWF policy agenda, would WWF involvement in this landscape make?

	WWF there already	WWF value added	WWF capacity	Partner-ships	Catalysis	Sustainable presence	WWF real contribution	WWF policy contrib
Kinabatangan / Segama	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Betung Kerihun / Danau Sentarum	Yes	Yes	Yes	ITTO	Yes	Yes	Yes	Yes
Sebangau	Yes	Yes	Yes	SIMTROP	Yes	Yes	Yes	Yes
Arut-Belantikan / Bukit Rongga-Parai	No	Yes	Low	NASA	Yes	Possibly	Yes	Yes
Leuser	Yes	Yes	Low	CI, LMU	Yes	Possibly	Possibly	Yes
Lanjak-Entimau / Batang Ai	Yes	Yes	Low	WCS	?	?	?	?
Tanjung Puting	No	Yes	No	CI	Possibly	No	No	Yes
Gunung Palung	No	Yes	Low	FFI	Possibly	No	No	Yes
Kutai	No	No	No	-	No	No	No	Yes
Berau	No	No	Low	TNC	Possibly	No	No	Yes