STRATEGY AND
ACTION PLAN FOR CONSERVATION OF
BANTENG (*Bos javanicus*)
2010 – 2020

2012

Strategy and Action Plan for Conservation of Banteng (Bos javanicus)

2010-2020

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MENTERI KEHUTANAN
REPUBLIK INDONESIA

FORESTRY MINISTERIAL REGULATION OF THE REPUBLIC OF INDONESIA Number: P.58/Menhut-II/2011

CONCERNING

STRATEGY AND ACTION PLAN FOR BANTENG (*Bos javanicus*) CONSERVATION 2010 - 2020

UPON THE MERCY OF GOD THE ALMIGHTY

MINISTER OF FORESTRY OF THE REPUBLIC OF INDONESIA,

Considering :

a. That in order to improve conservation of banteng (*Bos javanicus*) and its habitat, it is a necessary to have a national banteng conservation strategy and action plan. This plan will function as a framework for the handling of conservation priorities in an integrated way, and involving all the relevant parties and stakeholders;

b. That in the context of improving banteng conservation efforts as referred to in point 'a.', a conservation strategy and action plan for banteng (*Bos javanicus*) is necessary;

c. That based on the considerations as referred to in point 'a.' and point 'b.' mentioned above, it is necessary to stipulate a Forestry Ministerial Regulation concerning the Conservation Strategy and Action Plan for Banteng (*Bos javanicus*) for the period 2010 -2020.

Bearing in Mind:

1. Law No. 5 of 1990 on the Conservation of Living Natural Resources and the Ecosystems which are a part of it (State Gazette of the Republic of Indonesia Year 1990 Number 49, Supplement to State Gazette of the Republic of Indonesia Number 3419);
2. Law No. 5 of 1994 on the Ratification of the United Nations Convention on Biological Diversity;
3. Law No. 41 of 1999, as amended by Law No. 19 of 2004 on the Enactment of Government Regulation Stipulation in Lieu of Law No. 1 Year 2004 concerning the amendment of the Forestry Law No. 41 of 1999 becoming Law (State Gazette of the Republic of Indonesia Year 2004 Number 86, Supplement to State Gazette of the Republic of Indonesia Number 4412);
4. Law No. 32 of 2004 on the Regional Governments (State Gazette of the Republic of Indonesia, Year 2004, Number 125, Supplement to State Gazette No. 4437) as amended several times, with the last change made through Law No. 12 of 2008, concerning Regional Governments (State Gazette of the

Republic of Indonesia Number 59, Supplement to State Gazette of the Republic of Indonesia Number 4844);

5. Law No. 32 of 2009 on Environmental Protection and Management (State Gazette of the Republic of Indonesia Number 140, Supplement to State Gazette of the Republic of Indonesia Number 5059);
6. Law No. 18 of 2009 on Animal Husbandry and Animal Health (State Gazette of the Republic of Indonesia Number 84, Supplement to State Gazette of the Republic of Indonesia Number 5015);
7. Government Regulation No. 68 of 1998 on Conservation and Protected Areas (State Gazette of the Republic of Indonesia Number 132, Supplement to State Gazette of the Republic of Indonesia Number 3776);
8. Government Regulation No. 7 of 1999 on the Preservation of Flora and Fauna Species (State Gazette of the Republic of Indonesia Year 1999 Number 14, Supplement to State Gazette of the Republic of Indonesia Number 3803);
9. Government Regulation No. 8 of 1999 on the Use of Wild Flora and Fauna (State Gazette of the Republic of Indonesia Year 1999, Number 15, Supplement to State Gazette of the Republic of Indonesia 3802);
10. Government Regulation No. 45 of 2004 on Forest Protection (State Gazette of the Republic of Indonesia Year 2004, Number 147, Supplement to State Gazette of the Republic of Indonesia Number 4453) as amended by Government Regulation No. 60 of 2009, concerning Forest Protection (State Gazette of the Republic of Indonesia Number 137, Supplement to State Gazette of the Republic of Indonesia Number 5056);

11. Government Regulation No. 6 of 2007, as amended by Government Regulation No. 3 of 2008, concerning Forest Arrangement and the Formulation of Forest Management Plans, as well as Forest Exploitation (State Gazette of the Republic of Indonesia Year 2008 Number 16, Supplement to State Gazette No. 4814);
12. Government Regulation No. 36 of 2010 on Nature Tourism Consession in Wildlife Reserves, National Parks, Grand Forest Parks and Nature Tourism Parks (State Gazette of the Republic of Indonesia Year 2010, Number 44, Supplement to State Gazette of the Republic of Indonesia Number 5116);
13. Presidential Decree No. 43 of 1978 on the Ratification of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora);
14. Forestry Ministerial Decree Number 355/Kpts-II/2003 on the Identification of Wild Plant and Animal Specimens;
15. Forestry Ministerial Decree Number 447/Kpts-II/2003 on the Administration Directive for Collecting, Capturing and Distribution of Wild Plant and Animal Specimens;
16. Forestry Ministerial Regulation Number P.57/Menhut-II/2008 on Strategic Direction of the National Species Conservation 2008-2018;
17. Forestry Ministerial Regulation Number P.40/Menhut-II/2010 on the Structure and Organization of the Ministry of Forestry.

HAS DECIDED:

To STIPULATE: MINISTER OF FORESTRY REGULATION ON STRATEGY AND ACTION PLAN FOR BANTENG (*Bos javanicus*) CONSERVATION 2010-2020.

Article 1

The Strategy and Action Plan for Banteng (*Bos javanicus*) Conservation 2010-2020, as mentioned in the attachment is an integral part of this regulation.

Article 2

The Strategy and Action Plan for Banteng (*Bos javanicus*) Conservation 2010-2020, as referred to in Article 1 is a framework for various programmes and activities which are compulsory to become guidelines in conducting national species conservation effots.

Article3

The Strategy and Action Plan for Banteng (*Bos javanicus*) Conservation 2010-2020, is a document which includes conservation strategies that will be evaluated and updated every 5 (five) years.

Article 4

This Forestry Ministerial Regulation shall come into force on the date of promulgation.

This Forestry Ministerial Regulation will be promulgated with its placement in the Official State Report of the Republic of Indonesia, so that each person may be aware of the regulation's existence.

Stipulated in Jakarta
On 18th July 2011

MINISTER OF FORESTRY
THE REPUBLIC OF INDONESIA,
Signed,

ZULKIFLI HASAN

Promulgated in Jakarta
On 22th July 2011

MINISTER OF JUSTICE AND HUMAN RIGHTS
REPUBLIC OF INDONESIA,
Signed,

PATRIALIS AKBAR

STATE REPORT OF THE REPUBLIC OF INDONESIA YEAR 2011 NUMBER 446

Copies of the original
Head for Bureau of Legal Affair and Organization,
Signed,

KRISNA RYA, SH, MH
NIP. 19590730 199003 1 001

Annex I Forestry Ministerial Regulation
Number : P. 58/Menhut-II/2011
Date : July 18th 2011

STRATEGY AND ACTION PLAN FOR BANTENG (*Bos javanicus*) CONSERVATION YEAR 2010-2020

I. INTRODUCTION

1.1. Background

Banteng (*Bos javanicus* d'Alton, 1823) is a species of Asian wild cattle and listed as Endangered on the IUCN Red List (Timmins et al., 2010). The species is also known by the name Tembadau in Kalimantan (Borneo). The natural distribution of banteng covers large parts of the Southeast-Asian region, starting from Myanmar, Thailand, Laos, Vietnam and Cambodia to Yunan China, as well as the islands of Kalimantan and Java in Indonesia. Meanwhile, banteng have been declared extinct in Peninsular Malaysia (Francis, 2008). In Indonesia, banteng is one of the largest mammal species, next to the Javan rhino (*Rhinoceros sondaicus sondaicus*) on Java, and the Borneo pygmy elephant (*Elephas maximus borneensis*) on Kalimantan.

Banteng is considered an adaptable species, which is able to survive in various types of habitats. This includes areas characterized by low rainfall, concentrated within a short period each year, as well as seasonal deciduous monsoon forests and grasslands. Banteng also occur in high rainfall areas dominated by evergreen forest. Banteng in mainland Asia generally prefer bamboo forest and seasonal monsoon forest dominated by the Dipterocarpaceae family. In Myanmar, banteng is found both in monsoon-and evergreen forests (Timmins *et al*., 2008).

Banteng have an important cultural and economic value for Indonesia. Notes on the interaction between man and banteng can be found in the Kakawin Nagaraktragama book written by Prapanca in 1365 AD. In Indonesia, the banteng has also become a symbol of nationalism. For example, a banteng's head is the chosen symbol of an established political party. Also, banteng is the ancestor of Bali cattle (*Bos javanicus f. domestica*), which was

originally bred in Java and Bali. Cattle domestication in central and southern Asia began around 6,000 to 2,000 BC, although there is no definitive data on the exact time period banteng were domesticated in Indonesia.

According to De Haan, the capture of wild banteng to support labour in coffee plantations still occurred in West Java until the 18th century (Hoogerwerf, 1970; Meijer, 1962). Crossbreeding between banteng and zebu (*Bos taurus*), from India, already occurred around 1500 years ago in East Java and Madura. The result of this crossbreeding was the Madura cow (Meijer, 1962; National Research Council, 1983; Nijman et al., 2003). Banteng provide a very valuable genetic resource as well, due to their high tolerance for low quality feed, humid and hot environments during the rainy season and the hot and dry conditions of the dry season (National Research Council, 1983).

In Indonesia, the population and habitat of banteng have been declining continously. The main threats to banteng are the destruction and conversion of habitat, poaching, disease, hybridization with cattle, potential inbreeding depression, as well as predators such as ajak (*Cuon alpinus*), which is also listed as an Endangered species. Global climate change is considered to have had an influence, but the exact impact is unknown. In Ujung Kulon National Park (TNUK), another potential threat is ecological competition between the javan rhino and banteng through suggested occupation of a similar feeding niche (Mulyati, 1998; YMR, WWF, Ministry of Forestry, 2002; UGM). Another threat is the hunting of banteng that raid crops on agricultural land and plantations, especially in East Java (Hedges, S. and Meijaard, E. 1999), combined with an unclear national policy on how to manage populations of banteng living in production forests and plantations. The Center of Natural Resources Conservation (KSDA) of East Java (2010) notes that in Banyuwangi, since 2001 no less than 15 banteng have died following conflicts outside of conservation areas.

Based on the information above, it was realized that successfull protection of banteng can only be assured if all the relevant parties

have a high commitment towards this goal. The relevant parties whose support is needed in banteng conservation are the Ministry of Forestry, Regional Governments, Perhutani Public Companies, plantation and forestry companies, holders of IUPHHK Nature/Plant (forest concession holders), conservation organizations, the Indonesian Zoo and Aquarium Association, non-governmental organizations, as well as institutions of research and education.

The condition of the banteng population, which is of global concern, and the sub-optimal roles played by relevant parties motivated the IUCN-SSC AWCSG to hold a workshop on conservation strategy planning for wild cattle, including banteng populations in South-and South East Asia. The event was held in June 2008 in Vietnam. The workshop resulted in several formulations for effective banteng conservation at the regional level that needed to be translated further into national strategies by each country containing wild populations. As a follow-up to the workshop, the Ministry of Forestry is collaborating with the AWCSG to organize a workshop on the national level, to create a strategy plan for banteng conservation in Indonesia and involving various relevant parties. The target of this workshop is to gather the latest information on the population and distribution of banteng in Indonesia, as well as problems and threats. Hopefully, through this workshop, concencus can be reached on a reasonable and practical banteng conservation strategy ensuring the preservation of the species and reflecting the hopes, shared desires and support of the relevant parties for the progress of banteng conservation.

1.2. Goal and Objective

The goal of this "Strategy and Action Plan for Banteng (*Bos javanicus*) Conservation 2010-2020" is to provide direction and guidance on the strategies, priorities and action plans for banteng conservation at the national and regional level for the 2010-2020 period. In this way the programs can be implemented in a foccussed and well coordinated way, with synergy in the activities undertaken by the various parties.

The objective of this Strategy and Action Plan for Banteng (*Bos javanicus*) Conservation 2010-2020, is to actualize an increase of the banteng population by approximately 5% in 2020.

1.3. Scope

The scope of this Strategy and Action Plan for Banteng (*Bos javanicus*) Conservation 2010-2020, covers efforts to increase the population of banteng to a viable level, safeguarding sufficient habitat with adquate carrying capacity, as well as improving public awareness about the critical value of banteng.

1.4. Definition

The definitions of terms used in this Regulation are:

a. **Habitat** consists of the overall resources, conditions and environments that enable an organism to live and breed.

b. **IUCN Red List** is a list indicating the level of threat of extinction faced by plant and animal species. The list is managed by The International Union for the Conservation of Nature (IUCN)

c. **Viable population** is a population that is able to maintain its genetic diversity up to 90% within a period of 100 years.

d. **Ex-situ conservation** conservation efforts undertaken outside the natural habitat of a species.

e. **In-situ conservation** conservation efforts undertaken in the natural habitat of a species.

f. **Metapopulation** consists of several interconnected sub-populations with the potential of geneflow occurring between the populations.

g. **Population** is a group of individuals of the same species that live and interact in the same place.

h. **Reintroduction of wildlife** is an attempt to relocate and release a species of wildlife from captivity or a specific natural

population into a part of the species historic range where extinction or population declines occurred.

i. **Studbook** is a book containing a list of all the individuals in a captive breeding programme, as well as information on their ancestors. It is also known as a breeding register.

j. **Inbreeding depression** is a decrease of the well-being of a population due to mating between closely related individuals.

II. CURRENT CONDITION OF BANTENG

2.1. Taxonomy and Conservation Status

The banteng is taxonomically divided into three sub-species, two of which occur in Indonesia. These are *Bos javanicus* javanicus, with its natural distribution on Java, and *Bos javanicus* lowi, which occurs on Kalimantan (Borneo). The sub-species *Bos javanicus* birmanicus can be found in mainland Asia, including Myanmar, Cambodia, Vietnam, Thailand, and Laos. The differences between the three sub-species can be observed from variations in pelage coloration and body size (Halder, 1978). The Javan banteng is the largest of the three subspecies, while the Kalimantan banteng is the smallest (Hoogerwerf, 1970). The exact number of subspecies remains an ongoing taxonomic debate. The separation between the Asian and Javan subspecies is based on very distinct differences in phenotype. However, the separation between the Javan and Kalimantan banteng is questionable, and they might be a single species (Timmins et al., 2008). Further genetic research is needed to determine the validity of the current sub-species classification.

Males and females have very distinct differences in pelage coloration and body sizes. Mature banteng males are usually of a dark black colour, while females are of a bright brown hue (Figure 1). Male and female horn shape is also different. In some very rare cases, there are males of a bright brown colour; examples of this have been found in Ujung Kulon National Park (TNUK) and Baluran National Park (TNB). Sexually immature banteng do not yet posses a distinct differrence in pelage colouration between the sexes.

Figure 1. A group of banteng consisting of mature males and females, and young and immature females in the Alas Purwo National Park.

The Conservation status of the banteng on the IUCN Red List underwent a change from Vulnerable during the period of 1986 - 1994 (Baillie & Groombridge 1996; Groombridge, 1994) to Endangered based on a review of the Red List assessment in 1996 (Baillie & Groombrigde, 1996). This shows the increase of threats faced by banteng, which have resulted in population declines. The wild cattle conservation workshop of 1994 (resulting in the Asian Wild Cattle Conservation Assessment and Management Plan) recommended Asian banteng (*Bos javanicus burmanicus*) to be classified as Critically Endangered (Heinen & Srikosamatara, 1996). Current estimations of the total number of banteng worldwide range between 5000-8000 individuals (Hegdes & Tyson, 2002; IUCN SSC, 2000). The largest population of banteng, consisting of around 6,000 individuals, occurs outside the natural distribution of the species in the Garig Gurnag National Park in Australia (Bradshaw et al.,

2006). However, it is still debated whether this population more closely resembles bali cattle or wild banteng.

2.2. Habitat, Population and Distribution

2.2.1. Habitat

Banteng can be found in areas with an altitutde up to 2,000 m above sea level (National Research Council, 1983). Generally, banteng prefer flat to slightly undulating areas, avoiding areas of steep and hilly relief. Wharton's (1968) summary on banteng habitat concluded that in mainland Asia, banteng prefer half-open secondary forest with pasture areas over closed primary forest. On Java and Kalimantan however, banteng prefer secondary forest, especially with signs of logging and burning, although sometimes banteng are also found in the more closed areas of sub-humid forests, away from forest-parts utilized by people.

Apart from the general image as described above, controversy remains over the extent to which which banteng exploit forest habitat. Hoogerwerf (1970) states that closed forest are not a suitable habitat for banteng, while open areas within or on the outskirts of forest represent a more suitable habitat. As an example he mentions that on Java banteng do not occur in dense jungle, but live in areas characterized by the presence of both open areas with grasses or grass-like plants, as well as more closed forests, such as in Ujung Kulon National Park (TNUK). Also, the habitat used by banteng varies during the year. Halder (1976) on the contrary, argues that there are also banteng that never visit grazing areas, as traces of banteng are found in almost all areas of the Ujung Kulon peninsula, apart from swamp areas and steep hilly terrain. Hommel (1983) reported frequent sightings of banteng herds in dense shrubland areas. (Ammann 1985; Hommel 1987).

The source of this uncertainty may lie in the fact that no distinction has been made between the preferred habitat and the used habitat. For example,

banteng can enter into deeper forest or hilly areas when they feel disturbed by human activities, even though it may not be their prefferred habitat.

In Australia, the suspected Bali cattle (or domesticated banteng) population prefers seasonal forests with sufficient grassland over other vegetation types (Bowman & Panton, 1991). Therefore it seems that maintaining or developing grassland areas within forests is an important aspect for banteng population management. Meijaard and Shield (2008) suggest that selective logging in production forests has a positive impact on banteng populations, under the condition that poaching can be controlled. Unfortunately hunting pressure usually increases when forests are cleared. Hoogerwerf (1970) concluded that the banteng population in Java will not develop if there is no human intervention, since both the grass and non-grass food plants of banteng do not grow in primary forests, but in secondary ones.

The presence of mineral licks is also important for banteng in order to meet their needs of minerals for growth. Tropical rainforest plants, such as in Kalimantan, generally contain low sodium (Na), therefore plant-eating animals require additional minerals, which they usually obtain from mineral licks. In Ujung Kulon National Park (TNUK), banteng have been observed drinking sea water, which was assumed to meet their needs for minerals (Alikodra and Sastradipraja, 1983). In addition, banteng in Baluran national Park (TNB) are known to drink brackish water from puddles along the coastline (Pudyatmoko, 2005).

The statement that banteng posses more characteristics of a grazer than a browser needs to be further investigated. This is because banteng do not merely depend on grasses for feeding. Observations in Ujung Kulon National Park (TNUK) indicated that the composition of banteng diets consisted of 20 grass species and 70 non-grass species, almost all of which were plant species typical of secondary forests, and only six of which were typical of primary forest (Hoogerwerf, 1970). The composition of banteng diets in Baluran National Park (TNB) of East Java consists of 23 grass species, 15 kinds

of non-grassy herbs and 20 species of trees (Pudyatmoko, 2005). A similar result was also obtained by Pairah (2007) in his research on banteng diets in Alas Purwo National Park (TNAP), East Java. Here banteng fed on 22 types of grasses and 55 non-grass species. Analysis on the stomach contents of several male banteng shot in South Cianjur found their diet was almost entirely composed of non-grass feeds, such as the leaves of *Trema orientale*, *Passiflora foetida*, *Lygodium* sp., and Musa sp. Moreover, there was one individual whose diet consisted entirely of a single type of plant, Passiflora foetida (Hoogerwerf,1970). Carbon isotope analysis of body tissues show the Austrialian population displays more browser characteristics, with non-grass feeds comprising 30% of the diet during the rainy season and increasing up to 75% in the dry season (Bowman et al., 2009). Based on the frequent presence of non-grassy plant species in banteng diets, the species can be said to be more of a mixed-feeder rather than a typical grazer.

2.2.2. Population

The size of the banteng population in Indonesia is difficult to estimate accurately due to limited data availlability, especially from Kalimantan. Estimations of banteng population numbers in various areas on Java can be seen in Table 1. However it must be kept in mind that some of the population estimates are based on predictions or calculations using non-standardized survey methods.

Banteng are found not only in conservation areas, but also in plantation areas, which often leads to conflict between conservation and plantation/farm management, or other related parties.

Table 1. Distribution of banteng habitat in Java

No.	Location	Area (Ha)	Estimation of populastion (individuals)	Source
1	Ujung Kulon Peninsula, Ujung Kulon National Park	30.000*	Year 1937:200-250 Year 1970: Max. 200 Year 1997:905	Hoogerwerf,1970 Halder, 1976 Integrated census of TNUK office, IPB
2	Wildlife preserve of Cikepuh- Cibanteng	8.000	Year 1970: 300 Year 1985: 139 Year 1988: 150 Year 2003: 25-65	Kompas 4th November 2003 Kompas 4th November 2003 Ashby & Antiapillai,1988 Kompas 4th November 2003
3	Bonjonglarang-Jayanti	750	No quantitative data available. However, inthe year 1988 a population of banteng was reported	Ashby & Santiapillai,1988
4	Cimapag	?	No available data, it is reported that a population was present until the 1970's	Hedges and Tyson 1996
5	Wildlife preserve of Leuweng Sancang	4.150	Year 1988:2000 Year 2000:10 2003:extinct	Ashby and Santiapillai 1988 Kompas 28th November 2003 Kompas 28th November 2003
6	Cikamurang	?	No available data,it is reported that a population was present until 1970	Hedges and Tyson 1996
7	Wildlife preserve of Pananjung Pangandaran	500	Until 1974:130 Year 1980: 80 Year 1988: 1	Ashby and Santiapillai 1988 Ashby and Santiapillai 1988 Ashby and Santiapillai 1988 Assumed that there was a cross breeding of genetics with Bos indicus in this population (Whitten *et al*., 1996)
8	Kediri	?	No available data, it is reported that a population was present until 1970	Hedges and Tyson 1996

No.	Location	Area (Ha)	Estimation of populasi (individual)	Data resource
9	Pantai Blitar		Year 1988: 12	Ashby and Santiapillai 1988
10	Malang Beach (Lebakharjo?)	?	Year 1988: 6 Year 1995: there is a population (No quantitative data available)	Ashby and Santiapillai 1988 Santosa, 2004
11	Meru Betiri National Park (TNMB)	58.000	Year 1986:65 Year 1989:124 Year 1997:128 Year 2002:147 Year 2007:174	Ashby and Santiapillai 1988 TNMB office Survey, 1989 TNMB office Survey, 1997 TNMB office Survey, 2002 TNMB office Survey, 2007
12	Alas Purwo National Park	43.420	Year 1993:300-400 Year 2002:80	Hedges and Tyson 1996 TNAP office Survey, 2002
13	Baluran National Park	25.000	Year 1970:150-200 Year 2002: 206 Year 2003:70-100 Year 2007:min 20	Halder,1976 Pudyatmoko,2005 Pudyatmoko,2005 TNB office Survey,2007
14	Treblasala Plantation (Glenmore – Banyuwangi)	3.643,11	Year 2005:11 Year 2009: there is a population (No quantitative data available)	Potency Assessment of Banteng Habitat in reblasala Plantation, KSDA Office Jatim. 2005 Thesis Dheny Mardiono)
15	Protected Forest Area of Londo Lampesan - Jember, Jawa Timur	1.213,90	Year 2010: there is a population (No quantitative data available)	Identification Report of Banteng habitat outside conservation areas. KSDA Office Jatim. 2010

*) only for a part of the whole TNUK area

It is believed that the population numbers and habitat of banteng in Kalimantan are continuously declining. According to records made, banteng are found in Tanjung Puting National Park (TPNP), Central Kalimantan, Kutai National Park (TNK), Kayan Mentarang National Park (TNKM), as well as

Muara Kaman and Sembuku Sembakung, in East Kalimantan (Grzimek, 1968). Banteng habitat in Kalimantan is shown in Table 2. However it must be kept in mind that many of the population estimates are based on predictions or calculations using non-standardized survey methods.

Table 2. Distribution of banteng habitat in Kalimantan

No.	Location	Population Estimation (individual)	Data source
1.	Lamandau Regency/ Central Kalimantan	No quantitative data available, population is distributed across several village areas	Indonesian Orangutan Foundation (YOI), 2007
2.	Kutai National Park	1989: 48 individuals 1993: 40 individuals 2002: 34 individuals 2003: 34 individuals	BTNK, 2003
3.	Kayan Mentarang National Park	2008: 72 individuals 2009: 40-50 individuals (for the Long Tua location, a further assessment is needed.in another location within Kayan Mentarang National Park)	BTNKM, 2008
4.	Nunukan Regency	No quantitative data available	Nasional Banteng Workshop, 2009
5.	Malinau Regency	No quantitative data available	Nasional Banteng Workshop, 2009
6.	Berau Regency	No quantitative data available	Nasional Banteng Workshop, 2009

Figure 2. A male banteng of *Bos javanicus* lowi subspecies

As a result of long-term forest destruction and fragmentation, banteng populations currently occupy isolated pockets of habitat. Habitat fragmentation has broken up the larger population into several smaller ones, with a greater risk of extinction.

Box 1. Extinction is a function of population size

The possibility of extinction is a function of population size: The smaller the population size, the larger the probability of extinction. A small population is more susceptible to extinction not merely due to its smaller size, but also because of stochastic genetic, environmental and demographic processes that have a far larger impact on smaller populations compared to larger ones. To reduce the influence of these factors, it is urgent that efforts are made as soon as possible, to increase the number of individuals in a certain population. The loss of genetic variation is also a function of effective population size. The larger the size of the population, the lower the potential for loss of genetic variation within the population and vice versa. As a general rule, a population can be considered viable if it has at least 500-5000 individuals. It is expected that banteng numbers in Java and Kalimantan can reach 2,500-3,000 individuals in 2020.

Ex-situ conservation consists of conservation efforts for animal and plant species undertaken outside of their natural habitat. According to the International Species Information System (http://app.isis.org/abstracts/abs.asp), on the 7th September 2010 there were 80 *Bos javanicus* held in conservation organizations worldwide, consisting of 25 females and 55 males. Meanwhile the total number of *Bos javanicus javanicus* was 138 individuals, consisting of 43 females and 95 males. In Indonesia there are 63 captive individuals, consisting of 35 females and 28 males, as listed in Table 3.

Box 2: Ex-situ conservation

Banteng populations in the ex-situ environment are of great value for restoring natural populations in the event of drastic reductions in natural population numbers or local extinctions. In addition, ex-situ conservation also facilitates education and awarenes raising on the importance of banteng conservation. When managing ex-situ populations, various efforts are required to maintain the genetic variability and demographic balance of the captive population. Therefore, cooperation programs between captive breeding institutions need to be formed both on a national and international level. Such cooperative programs will be difficult to develop without the availability of a banteng studbook, which can provide genealogical data of each individual banteng. Without complete genealogical data, it will not be possible to formulate recommendations on the exchange of animals to improve the genetic quality of the ex-situ population. To maintain 95% of the genetic variation in the banteng population, at least 60 unrelated individuals are needed, which can then be bred up to 300 individuals for each subspecies (IUCN Conservation Breeding Specialist Group).

Table 3. Ex-Situ Banteng Conservation in Indonesia in 2010

No	Conservation Organization	Amount of Banteng		
		Male	Female	Total
1	Taman Safari Indonesia II-Prigen	10	13	23
2	Ragunan Zoo	16	5	21
3	Gembiraloka Zoo	1	3	4
4	Taru Jurug	1	2	3
5	Surabaya Zoo	7	5	12
Total				63

2.2.3. . Distribution of Banteng

The information and data compiled on the distribution and population size of Indonesian banteng during the 2009 ''Banteng Conservation and Strategy 2010-2020'' workshop in Bogor resulted in a renewed distribution map (Fig. 3). The distribution status is divided into 5 (five) categories, namely confirmed range, possible range, doubtfull range, former range or extirpated, and unknown range. Figure 3 represents banteng distribution according to three of these categories, whilst the remaining two categories could not be included due to a lack of data or information.

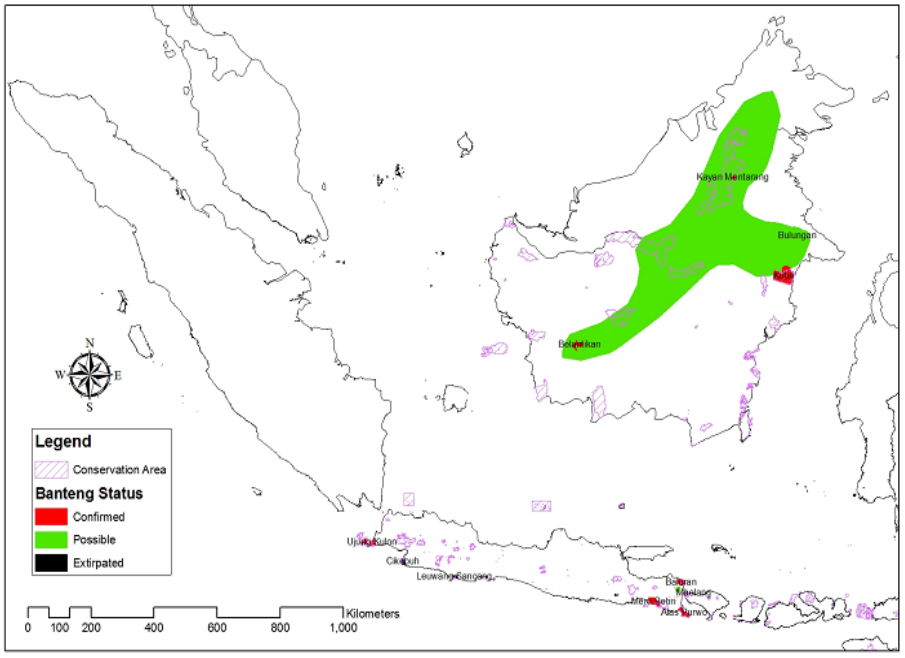

Figure 3. Map of banteng distribution in Indonesia

Box 3: Priority Location for banteng conservation

Priority locations for banteng conservation are determined by considering which subspecies is present, the size of the area, safety concerns and whether banteng conservation management units are already present in the area. The highest priority areas are TNUK, TNMB, TNB and TNAP for *Bos javanicus* javanicus, while for *B.j lowi* the highest priority areas are TNK and TNKM Kalimantan. Meanwhile, of lower priority are other areas with possible or comfirmed banteng habitat as illustrated in table 2, 3 and figure 3. This division in priorities for the 2010-2020 period was made because of limitations in terms of funding, human resource capacity, and other resources.

III. STRATEGIC PLAN

3.1. Vision

The vision of the strategy and action plan for banteng conservation 2010-2020 is: "actualizing a banteng population on Java and Kalimantan, which has increased by approximately 5% in its natural habitat in the year 2020."

3.2. Mission

To achieve the vision of the action plan for banteng conservation 2010-2020, the mission is formulated as follows:

1. Increasing the management intensity of banteng populations both in-situ and ex-situ.
2. Safeguarding the broad availlibility of banteng habitat with sufficient carrying capacity.
3. Ensuring the availability of data management systems both at the national and regional level.
4. Improving the capacity of banteng habit and population management staff and personnel.
5. Improving synergy, coordination and synchronization between parties supporting banteng conservation.
6. Increasing the popularity of banteng conservation and the economical value it has for the welfare of society.

3.3. Analysis of the Internal Environment

3.3.1. Strength

Internal factors that will become the supporting strength for banteng conservation are as follows:

a) Banteng is a flagship species that is legally protected and receives high conservation priority in several National Parks.

b) Most banteng populations and habitat are located inside conservation areas with a distinct management unit.
c) Banteng is an important source of germplasm in support of livestock farming, as well as an important resource for supporting eco-tourism and the national economy.

3.3.2. Weakness

The factors weakening banteng conservation efforts are as follows:

a) The limited ability of the government apparatus in conserving banteng populations and safeguarding habitat.
b) The limited funds allocated for banteng conservation.
c) Data and knowledge on banteng populations and habitats is incomplete and of low validity.
d) Cross-sectoral cooperation for banteng conservation has not been properly developed.
e) The popularity of banteng as a protected species is still very low in the wider community.
f) The low capacity of staff and other parties (NGO, researchers, and communities) in implementing the action plan.

3.4. Analysis of External Environment

External factors that can pose opportunities or threats to the success of implementing the strategy and action plan for banteng conservation are:

3.4.1. Opportunities

a) There are national conservation organizations involved in banteng conservation.
b) There are strong international institutions willing enough to help banteng conservation efforts.
c) There is an increase in awareness among Regional Governments with respect to natural resource conservation in their territories.

d) There is an increase in awareness among national and multinational companies to set aside funds for the conservation of biological resources.

3.4.2. Challenges

a) The clearing and conversion of forest for other purposes has the potential to reduce available banteng habitat and reduce the population.
b) Poaching is still rampant both within and outside conservation areas.
c) The awareness of the general public and other parties about the importance of banteng conservation is still low.
d) The possibility of disease transmission from livestock to wild banteng.
e) The loss of genetic diversity due to inbreeding i n small banteng populations.
f) The decline of banteng habitat quality due to invasion by exotic or plague plant species. For example, a widespread native species named langkap (*Arenga obtusifolia*) and *Acacia nilotica*. Where these species occur, the forest floor is very rarely overgrown with shrubs, other trees, and grasses important to banteng.

3.5. Assumptions

The vision for banteng conservation in 2020 can be realized when the following assumptions are met:

1. Workload of agencies

   The organizational structure and workload of agencies responsible for forest protection and nature conservation, particularly biological resources conservation, will not undergo a significant change.

2. Human Resources

   The quality and quantity of human resource are increased in proportion to their needs, so that banteng conservation can be undertaken effectively and efficiently.

3. Science and technology

   Science and technology will be more advanced and utilized by the authorities, so that they support the effectiveness of banteng conservation. Availlable technologies for habitat management, population management and information systems can be applied at an affordable price.

4. Support from the parties

   The synergy among the parties involved in banteng conservation, consisting of institutions within the Ministry of Forestry, Regional Government, conservation organizations, non-governmental organizations, universities, research institutions, companies, will increase.

3.6. Determinant Factors of Success

Based on the analysis of the internal and external environment, as well as the assumptions described above, the determinant factors of success can be described as follows:

1. The increase of professionalism and performance among management institutions of conservation areas, general conservation organizations, zoo associations, as well as the government or the relevant management units at the central and regional level.
2. Synergistic cooperation between various parties.
3. The availability of adequate funds, allocated from various sources, whether from the government or private and international institutions.

4. An increased awareness among the general public on the importance of banteng conservation.
5. The possession of sufficient relevant and high-quality knowledge as a basis for good decision-making.

IV. STRATEGIC MANAGEMENT

4.1. Program

Based on the formulated vision and mission, the analysis of the internal and external environment and considering the determinant factors of success, the programs of priority for banteng conservation are as follows:

4.1.1. Population management

Extinction is a function of population size, as well as of genetic diversity and climatic influences. The decline of populations causes the risk of extinction to become increasingly high. Therefore, establishing a program for increasing population sizes is especially urgent for the conservation of species with small population sizes. Next to this, the level of poaching and other illegal activities that hamper banteng conservation efforts must be resolved.

4.1.2. Habitat management

Habitat is a place that provides all the resources and conditions necessary for a certain species of wildlife to live and breed. Habitat decline and fragmentation, as well as the degradation of habitat quality, are real threats that need to be dealt with.

4.1.3. Data management system

A well functioning data management system is very important in order to be able to quickly find information on the banteng population and habitat dynamics. This system will also help in managing the decision-making process quickly and accurately.

4.1.4. Improving the professionalism in the government apparatus

The professionalism of the government apparatus is one of the keys to successfull wildlife conservation. The competences sought to be increased are wildlife handling abilities, interpreting

banteng ecotourism potential, survey and monitoring of populations and habitats, analyzing data and interpreting survey results obtained from wildlife conservation activities, as well as persuasive capabilities in providing conservation education to communities.

4.1.5. Improving cooperation between parties

It is important that cooperation takes place between the parties involved in managing the ex-situ population of banteng , as well as in management of banteng populations outside of protected areas, in fund raising, in public awareness campaigns focussed on the importance of banteng conservation and in handling violations of conservation regulations.

4.1.6. Improving banteng popularity and its economic value

Conservation efforts are usually more easily established if communities and local governments feel either a direct or indirect benefit from the species to be conserved.

4.2. Objective

4.2.1. The objective of the population management program is to increase banteng populations to viable population levels in 4 (four) priority areas in Java (TNB, TNMB, TNAP, and TNUK) and 2 (two) priority areas in Kalimantan (TNK and TNKM), with all populations maintaining a high genetic variation and ecological function, with these efforts decreasing the rate of decline of other species in these priority areas as well.

4.2.2. The objective of the habitat management program is to safeguard banteng habitat of high quality with sufficient carrying capacity, so that declines in banteng populations can be avoided.

4.2.3. The objective of the data management system is the availability of a system that is easily accessible, so that

habitat development and banteng population dynamics throughout Indonesia can be monitored periodicallly.

4.2.4. The objective of improving the professionalism of the government apparatus is to increase the competence of the officers in banteng conservation through training and education.

4.2.5. The objective of improving cooperation between parties is to increase the involvement of organizations, institutions and companies in banteng conservation, whether in the form of funding or other methods of supports.

4.2.6. The objective of improving the popularity and economic value of the banteng is to increase banteng conservation popularity and the recognition of the high economic value of banteng conservation efforts.

4.3. Activities

The activities of each program are as follows:

4.3.1. The activities of the population management program activities include inventory and monitoring of populations, assessing genetic diversity, preventing poaching, establishing a banteng rescue center for banteng as a first step towards restoring banteng populations, relocating banteng from isolated populations in order to save populations that experience declines (relocation activities are supported by risk assessments, animal health checks, and following guidelines such as those set out by the IUCN), establishing a banteng management unit (for monitoring and safekeeping), standardization of ex-situ banteng management in order to reach the target of increasing the global captive population to 300 from an initial breeding population of 30 captive individuals, as well as exchanging banteng species between conservation

insititutions to avoid decreases in the genetic diversity of the captive population resulting from inbreeding.

4.3.2. The program activities of the habitat management program are habitat development through rehabilitation or restoration, habitat protection, development of High Conservation Value Forest (HCVF) that will form banteng habitat outside of conservation areas, landscape-based habitat development, controlling invasive species that negatively affect banteng habitat, and the absence of cattle in banteng habitat.

4.3.3. The activities of the program for the data processing system consist of developing a banteng management information system, and developing a banteng data base both on the central governmental and regional level.

4.3.4. The program activities to improve the professionalism of the government apparatus are the training of wildlife handling, training in conducting surveys and wildlife monitoring, training in conducting anti-poaching patrols and population management, training in data processing and reporting, training in interpreting banteng eco- tourism potential, training of counseling skills, providing veterinary medical experts especially for disease handling and post-conflict care of banteng.

4.3.5. Program activities to improve the cooperation between the parties include establishing partnerships for banteng conservation funding, supporting partner contributions, and establishing a Banteng Conservation Forum.

4.3.6. The program activities to improve popularity and economic value of banteng consist of introducing banteng to the general public, a banteng award performance competion, establishment of banteng ecotourism, banteng usage for cattle breeding, performing a study and socialization activities on the economic valuation of banteng

conservation which can be used as a guideline for further development.

4.4. Performance Measurement

4.4.1. Determination of Performance Indicator

Performance indicators are determined to evaluate whether the action plan has been carried out in line with the targets set out and on time. Performance indicators have been chosen that are cheap and easy to measure. The performance indicators for each program can be seen in detail in Table 4. The outline of performance indicators is as follow:

4.4.1.1. The performance indicator of the population management program is the number and size of banteng populations that have experienced increases in population numbers in their natural habitat, especially in the priority areas.

4.4.1.2. The performance indicator of the habitat management program is the increase in carrying capacity of banteng habitat, indicated by the increase in habitat size and quality.

4.4.1.3. The performance indicator of the data processing system program is the availability of a banteng information management system with high reliability, that is connected to the central governmental and regional level and regularly updated.

4.4.1.4. The performance indicator of the program to improve the professionalism of the government apparatus is the increase in the staff's capacity to manage banteng conservation, protecting the species and its habitat, as well as the capacity in managing banteng ecotourism.

4.4.1.5. The performance indicator of the program to improve cooperation between parties is the increase in the number of parties involved and the increase in the amount of funds raised from non-governmental institutions for managing banteng both on a national and international level.

4.4.1.6. The performance indicator of the program for improving banteng popularity and its economic value is the increase in public knowledge on the banteng, as well as an increase in perceived benefits of the presence of banteng, especially among local communities.

4.4.2. Determination of Performance Standards

The implementation of performance standards of the strategy and action plan for banteng conservation are as follows:

4.4.2.1. Realizing an increase in the banteng population size, especially in the priority areas, in 2020.

4.4.2.2. Implementing efforts to increase the carrying capacity of banteng habitat, starting in 2010.

4.4.2.3. Realizing the banteng information management system, and establishing banteng databases at both the central governmental and regional levels in 2011.

4.4.2.4. Realizing an improvement in the capacity of the government apparatus in managing banteng populations and habitat in 2011.

4.4.2.5. Realizing an increase in the number of parties synergizing for banteng conservation, starting in 2011.

4.4.2.6. Implementing efforts to improve the popularity of banteng conservation and increasing the recognition of its high economic value, starting in 2012.

4.5. Monitoring and Evaluation

Monitoring is a systematic and periodical process collecting information regarding all the running activities and their results within a project or activity. Monitoring is used to determine the progress of these activities. There are four types of indicators that will be used for monitoring, namely: input indicators, output indicators, outcome indicators and impact indicators.

The monitoring process must be performed in all cycles of the project/activity:

4.5.1. Monitoring of the project planning (situation analysis, problem identification, formulating objective, arranging the working plan and budget).

4.5.2. Monitoring project implementation (mobilization, utilization and controlling of inputs or resources).

4.5.3. Monitoring the project evaluation.

An evaluation is conducted of the project implementation to identify obstacles that prevent the project objectives from being achieved. This activity also has the goal of determining possible solutions to overcome these obstacles. The evaluation is carried out before, during and after the project implementation.

V. LOGICAL FRAMEWORK AND TIMEFRAME

The strategy and action plan for banteng conservation 2010-2020 is implemented through the framework listed in Table 4. In the table, the assessment of the program's success is decribed through performance indicators for each activity. In addition, the parties that might be involved in the implementation of each program are indicated. The involvement of the parties can take many forms, both direct and indirect.

Estimated timeframes for the implementation of all activities in the six programs are listed in Table 5.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
1	Population management.	Increasing the size of the banteng population to viable levels with high genetic variation and ecological function.	a. Inventory and monitoring of banteng populations.	a1. Availability of guidelines for monitoring and inventory of banteng populations. a2. Data on the distribution , size and structure of banteng populations are available and updated at least every 5 years. a3. The population dynamics of the banteng population are known. a4.The biology, population dynamics and behavior of ajak (Cuon alpinus), as a predator of banteng, is known and monitored, especially in areas in East Java.	(2010-2020)	Ditjen PHKA/ BKSDA or National Park (TN/University(PT)/ LSM/ Research and Development Center of Forestry.
			b. Prevention of banteng poaching.	b1. Poaching of banteng can be reduced up to 80% in priority areas, and the reduction of poaching also occurs in other habitats. b2. Availability of information on banteng	2011-2020	BKSDA or TN/ Local Community/ LSM/ Regional Government/ Companies.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
				poaching, including information about the poachers. b3. Undertaking legal processes against banteng poachers and those undertaking other illegal activities		
			c. Relocating banteng from isolated populations to rescue populations that are experiencing decrease (following risk assessments, checking animal's health and following guidelines such as those set out by the IUCN).	c1. Rescuing isolated and fragmented banteng populations and translocating them to form a new population based on existing guidelines	2015-2020	Ditjen PHKA/ BKSDA or TN/ PT/ Regional Government/ LSM/ Lembaga Konservasi (LK)/ Research and Development Center of Forestry.
			d. Assessment of banteng genetic diversity.	d1. Banteng genetic diversity within and between populations can be identified and quantified. d2. Sub-species status of banteng can be determined. d3. The result of the assessment is included	2011-2015	BKSDA or TN/ PT/ Ditjen PHKA/ LSM/ Research and Development Center of Forestry.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
				into a new legislation, amongst others to anticipate how to handle the law in potential judicial processes		
			e. Establishing a banteng rescue center for banteng who are the victim of conflict, as a first step towards restoring the banteng population	e1. Performing studies on the behavior, fodder, diseases, environment, as well as on the handling of banteng, for example on how to handle banteng wounded as a result of conflicts, etc. e2. Undertaking banteng rehabilitation and habituation before releasing back into the wild. e3. Availability guidelines/ instruction for handling banteng pre- and post-conflict.	2011-2015	BKSDA or TN/ Companies/ PT/ LSM/ Research Institutions.
			f. Establishing banteng management units (for monitoring and safekeeping).	f1. Forming a banteng management unit in every Technical Implementation Unit (UPT) KSDA/TN, of	2012	BKSDA or TN/ Community/LSM/ Regional Government /Companies.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
				the government. f2.The banteng management unit actively participates in monitoring and securing banteng.		
			g. Standardization of ex-situ banteng management in order to reach the global target population, namely 300 (three hundreds) individuals obtained from 30 (thirty) sires without disturbing the natural population.	g1. Guidelines for ex-situ banteng conservation have been arranged. g2. Standardizing banteng management, with these guidelines included into a banteng studbook that is regularly maintained and updated, with reports made to the Management Authority.	2011-2012	Ditjen PHKA/ Perhimpunan Kebun Binatang Se-Indonesia (PKBSI)/ BKSDA/LK.
			h. The exchange of banteng between conservation agencies to avoid decreases in genetic quality as a result of inbreeding.	h1. Actively managing the population in order to obtain a population that is of sufficient genetic quality so that the target of 300 individuals managed ex-situ (national and global) can be	2013-2020	Ditjen PHKA/ PKBSI/ LK/BKSDA.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
				achieved. h2. Appointing studbook keepers, organizing the studbook in line with regulations and providing regular updates. h3. Exchanging/ borrowing banteng between conservation agencies for breeding purposes and to avoid inbreeding.		
2	Habitat management	Ensuring habitat is extended, as well as safeguarding the quality, safety and and carrying capacity of habitat, so that a viable banteng population can be maintained.	a. Habitat development through rehabilitation or restoration	a1. The availability of water sources, fodder, and an overall environment of good quality for living and breeding. a2. Preventing over-grazing so that population increases can be realized, especially in the priority areas, namely TNB, TNAP, TNMB, TNUK, TNKM and TNK, by measuring the increase of	2010-2020	Ditjen PHKA/ BKSDA or TN/ Companies/ Regional Government/ LSM/ PT.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
				banteng occupancy, grazing areas, reproduction rates, etc.		
			b. Habitat protection	b1.Reducing the level of habitat clearing and other illegal activities that can lower the quality and quantity of banteng habitat b2.Undertaking rehabilitation and restoration of habitats that are damaged by clearing and other illegal activities.	2010-2020	BKSDA or TN/ Regional Government/ Companies/ LSM/ Community.
			c. Development of High Conservation Value Forest (HCVF) to form banteng habitat outside of conservation areas	c1. An MoU for implementating HCVF, or Best Management Practices are available for managing banteng outside of conservation areas. c2.There are a minimum of 3 HCVF programs (1 in Java and 2 in Kalimantan).	2013-2020	Ditjen PHKA/ BKSDA/ BTN/ Companies/ LSM/ Community/ Regional Government/ Research Institutions.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
			d. Landscape-based habitat development	d1. Implementing corridor development as agreed upon by relevant parties.	2015-2020	Ditjen PHKA/ BKSDA/ BTN/ Companies/ Community/ Regional Government/ LSM/ Research Institutions.
			e. Controlling invasive species that negatively affect the carrying capacity of banteng habitat	e1. Reducing the presence of invasive species up to 50% in all piority areas such as langkap (Arenga obtusifolia) in the Ujung Kulon peninsula, Acacia nilotica in the Baluran National Park, as well as in the other habitats.	2012-2020	BKSDA/ BTN/ PT/ LSM/ Companies/ Research` Institutions
3	Data management system.	Providing a data management system that is easily accessible so that habitat development and population dynamics of banteng throughout Indonesia can be monitored on a periodical basis	a. Developing a banteng management information system.	a1. Information system software is provided.	2011-2013	Ditjen PHKA/ BKSDA/ BTN/ PT/ LSM.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
			b. Developing the banteng data base at the UPT and PHKA level.	b1. Banteng database in UPT and PHKA level is provided and regularly updated.	2012-2013	Ditjen PHKA/ LSM/ BKSDA/ BTN/ PT.
4	Improving staff professionalism	Improving officer competence in banteng conservation through training and education.	a. Training of wildlife handling.	a1. Officers ability in identifying and handling wildlife is increased.	2012	Ditjen PHKA/ BKSDA/ TN/ PT/ LK/ LSM/ Persatuan Dokter Hewan (PDHI)
			b. Training of surveys and wildlife monitoring.	b1. Officers ability in surveying and monitoring banteng is increased. b2. Implementing a standardized method for monitoring and inventorying banteng that is routinely performed.	2011	Ditjen PHKA/ BKSDA/ BTN/ PT/ LSM/ Regional Government/ Companies/ Research Institution.
			c. Patrol training, training of population management and training of anti-poaching, intelligence, handling and processing of a case.	c1. The staff's ability in regularly patrolling, supervising, as well as in arrestting and procesecuting poachers are increased.	2011	Ditjen PHKA/ BKSDA/ BTN/ PT/ LSM/ Research Institutions/ Education and

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
				c2. Competence in population management is increased.		Human Resources Development Agency for Forestry.
			d. Training of data processing and reporting.	d1. Competence in data processing and reporting is increased. d2. Data processing and reporting are performed in a standardized way.	2011	Ditjen PHKA/ BKSDA/BTN/ PT/ PHKA.
			e. Training the interpretation of banteng eco-tourism potential and guiding tours	e1. Officers are able to be a good interpreter and a guide. e2. Officers understand the biology and ecology of banteng in general. e3. Officers understand their area and other related information that are useful and can enhance the visitors' appreciation. e4. The availability of material to interpret	2012	Ditjen PHKA/ BKSDA/ BTN/ PT/ LSM/ Local Community/ Education and Human Resources Development Agency for Forestry.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
				the situation of banteng in the priority conservation areas		
			f. Training of counseling/ campaigning skills for banteng conservation	f1. Officers are capable of being good instructors. f2. Officers understand the general biology and ecology of banteng. f3.Officers understand the socio-economic and cultural conditions in surrounding communities. f4.The availability of materials for officers to provide information on- and, or, campaign banteng conservation in priority areas.	2012	Ditjen PHKA/ Pusat Penyuluhan / BKSDA/ BTN/ PT/ LSM/ Community/ Education and Human Resources Development Agency for Forestry.
			g. Providing veterinary medical experts, especially for disease and post-conflict handling of banteng	g1. The availability of veterinary medical officers that are easily deployed to every habitat prone to conflict.	2012	Ditjen PHKA/ BKSDA/ BTN/ LK/ PT/ LSM/ PDHI.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
				g2. The availability of adequate medical equipment for handling disease and post-conflict health of banteng.		
5	Improving cooperation between the parties	Improving the involvement of organizations, institutions and companies in banteng conservation, whether in the form of funding or other ways of support.	a. Establishing partnerships for banteng conservation funding	a1. The increase in numbers of banteng conservation partners	2011-2012	Ditjen PHKA/ BKSDA/ BTN/ PT/ Wide Community/ LSM/ LK/ Regional Government/ Companies.
			b. Raising support amongst parties	b1. The increase in funding for banteng conservation, a minimum of $2 million until 2020 at the central goverment and/or regional level, which is sourced from both national and international sources.	2011-2020	Ditjen PHKA/ BKSDA/ BTN/ PT/ Wide Community/ LSM/ LK/ Regional Government/ Companies
			c. Establishment of a Banteng Conservation Forum	c1. Establishing an active Indonesian Banteng Conservation Forum. c2. Establishing a better coordination between	2011-2012	Ditjen PHKA/ BKSDA/ BTN/ PT/ Wide Community/ LSM/ LK/ Regional Government/ Companies.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
				parties involved in banteng conservation . c3. Performing active coordination through mailing lists/ electronic-mail/ website/ etc. A minimum of one meeting between forum members per year to strengthen the forum/ coordination/ evaluation/ etc.		
6	Improving the popularity of banteng conservation and recognition of its economic value	Improving the popularity of banteng conservation and recognition of its high economic value	a. Introduction of banteng to the general public	a1. Popularity and awareness of banteng conservation are increased in priority areas by conducting school visits twice per year as well as giving presentations related to banteng conservation to surrounding villages communities at least twice per year. These activities will be carried out in other priority areas as well when possible. a2. The availability of	2012-2020	Ditjen PHKA/ BKSDA/ BTN/ PT/ Wide Community/ LSM/ Education and Human Resources Development Agency for Forestry.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
				materials such as books, leaflets, etc., to introduce banteng to the students and the wider community.		
			b. A Banteng award performance competition.	b1. Popularity and awareness of banteng conservation are increased	2013-2020	Ditjen PHKA/ BKSDA/ BTN/ PT/ LSM/ Company/Wide Community. c. Ditjen PHKA/ BKSDA/BTN/ompan y/ Indigenous people/Regional government/ PT.
			c. Establishment of banteng ecotourism.	c1.Establishing business units of banteng ecotourism involving local communities.	2013-2015	Ditjen PHKA/ BKSDA/BTN/ Company/Indigenou s people/Regional government/ PT.
			d. Banteng usage for breeding cattle.	d1.Establishing a cooperation with the Ministry of Agriculture, regional government, cattle breeders and conservation agencies for utilization of banteng in the ex-situ	2013-2020	Ditjen PHKA/ BKSDA/ BTN/ Kementerian Pertanian/ Cattle Breeder/Regional government/ PT/ LK/ Research and Development Center of Forestry/LIPI.

No	Program	Objectives	Activies	Performance indicators	Timeframe	Relevant Parties
				environment. d2. The availability of additional support for banteng conservation in its natural habitat or to the surrounding communities for utilitzing banteng to breed cattle.		
			e. Performing a study and dissemination activities on the economic valuation of banteng conservation which can be used as a guideline for development.	e1. Understanding the economic value of banteng conservation. For example through eco-tourism potential. This can be assessed from a strategic viewpoint. That is, both from the position of banteng in the ecosystem as well the closeness to banteng food sources. e2.Appreciating the importance of banteng conservation, especially at the regional governmental level	2013-2015	Ditjen PHKA/ BKSDA/ BTN/ PT/ LSM/ Regional government.

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signed.

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Table 5. Time procedure of strategy and action plan for banteng 2010-2020

No	Program	Activities	Year										
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	Population management.	a. Inventorying and monitoring of Populations											
		b. Prevention of poaching.											
		c. Relocating banteng from isolated population to rescue populations that have undergone decreases (by following risk assessments, animal health checks and following the IUCN guidelines).											
		d. Assessment of genetic diversity.											
		e. Establishing a banteng rescue center as a first step towards restoring the banteng population											
		f. Establishing banteng management units (for monitoring and safekeeping).											
		g. Standardization of ex-situ banteng management in order to reach the global target population,namely 300 (three hundreds) individuals obtained from 30 (thirty) sires without disturbing the natural population											
		h. Exchange of banteng species among the conservation agencies to avoid decreases in genetic quality resulting from inbreeding											

2	Habitat management.	a. Habitat development through rehabilitation or restoration.												
		b. Habitat protection.												
		c. Development of High Conservation Value Forest (HCVF) to form banteng habitat outside of conservation areas.												
		d. Landscape-based habitat development.												
		e. Controlling invasive species that negatively affect the carrying capacity of banteng habitat.												
3	Data Management System.	a. Development of a banteng management information system												
		b. Development of a banteng data base at both the regional and central government.												
4	Improvement of apparatus professionalism.	a. Training of wildlife handling skills.												
		b. Training of surveys and wildlife monitoring skills.												
		c. Training of anti-poaching patrol and population management skills.												
		d. Training of data processing and reporting skills.												
		e. Training of skills necessary to develop the potential of banteng eco-tourism.												
		f. Training of instructional skills.												

		g. Providing veterinary medical experts, especially for disease handling and post-conflict handling of banteng.												
5	Improvement of cooperation between parties.	a. Establishing a partnership for banteng conservation.												
		b. Raising support for banteng conservation.												
		c. Establishing a Banteng Conservation Forum.												
6	Improvement of conservation popularity and economic value of banteng	a. Introduction of Banteng to the general public.												
		b. Banteng award performance competition.												
		c. Establishment of banteng ecotourism.												
		d. Banteng usage for cattle breeding.												
		e. Performing a study and socialization activities on the economic valuation of banteng conservation which can be used as a guideline for development												

Annex II Forestry Ministerial Regulation

Number : P.58/Menhut-II/2011

Date : 18th July 2011

CATEGORY OF BANTENG DISTRIBUTION AREA

RANGE CATEGORY	DEFINITION AND CRITERION
Confirmed Range	Suitable areas occupied by banteng based on observations and recent reports indicating the presence of banteng:
January 2004 to date (Red)	Examples of these confirmed reports include**:** • Direct observations of banteng in the field • Telemetry locations indicating the presence of banteng • Body parts and the remains of banteng's carcasses found in the field • Photos of banteng (including the results of camera trapping which indicate the time and date on which the footage was obtained). • Body parts of banteng in the posession of local inhabitants (such as skulls, skin, bones – where the time, date and location of collection are approximately known) • Other signs of the presence of banteng such as footprints and feces
Possible Range (Green)	Suitable areas for banteng included in the historical range which are based on (1) Confirmed reports (as mentioned above) predating January 2004 or (2) unconfirmed reports: Examples of reports include:: • Provisional or unconfirmed results listed in original

	reports. • Information on the discovery/encounter of banteng that do not meet the criteria of confirmed reports (as mentioned above) • Banteng photos (including photos from camera traps) from which the location is uncertain or pictures of banteng where the time and date are not clearly imprinted. • Specimens or body parts of banteng that are not accompanied by data on the date, time and location where the specimen was originally collected. • Other signs such as footprints and feces of banteng that are not described in detail, or there is uncertainty in identifying the signs • All the information gathered from local inhabitants (including interviews) • Various reports that do not explain the type of evidence on which the presence of banteng at the referred location is based. Extrapolations based on the assumption that banteng are present in the surrounding area
Doubtful Range (Blue)	An area where based on various factors, such as extensive habitat conversion, it is estimated that banteng are no longer present, but where no field survey has been undertaken. If evidence of banteng presence is found in hindsight, the area can be reclassified as Possible or Confirmed range depending on the evidence.
Former Range (Black,solid)	Areas where there are several types of evidence that banteng were present in the past, but are no longer found in the area. This includes signs of banteng presence. Alternatively, it is predicted that the area is no longer suitable for banteng based on observations. It should be assessed whether the area would classify as Recoverable Range, which is defined as areas of a large enough size

	with the potential to become suitable banteng habitat within the next 10 years, either through natural development or through assisted development/
Unknown Range (Brown)	Areas where the current status and existence of the banteng are unknown.

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Head for Bureau of
Legal Affair and
Organization,

MINISTER OF FORESTRY
REPUBLIC OF INDONESIA

signed.

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