

**STRATEGY AND
ACTION PLAN FOR CONSERVATION OF
BABIRUSA (*Babyrousa babyrussa*)
2013 - 2022**

2013

Strategy and Action Plan for Conservation of Babirusa (*Babirusa babirusa*) 2013 - 2022

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MENTERI KEHUTANAN
REPUBLIK INDONESIA

**MINISTER OF FORESTRY
REPUBLIC OF INDONESIA**

**REGULATION OF THE MINISTER OF FORESTRY OF THE REPUBLIC
OF INDONESIA**

Number: P.55/Menhut-II/2013

ON

**THE STRATEGY AND ACTION PLAN FOR BABIRUSA (*BABYROUSA
BABYRUSSA*) CONSERVATION 2013-2022**

IN THE NAME OF ALMIGHTY GOD

MINISTER OF FORESTRY OF THE REPUBLIC OF INDONESIA,

Considering :

- a. That in order to improve conservation of Babirusa (*Babyrousa babyrussa*) and its habitat, it is a necessary to have a national babirusa conservation strategy and action plan. This plan will function as a framework for the handling of conservation priorities in an integrated management approach involving all the relevant parties and stakeholders;
- b. That based on the considerations as referred to in letter 'a,' it is necessary to stipulate a Forestry Ministerial Regulation concerning the Conservation Strategy and Action Plan for the Babirusa (*Babyrousa babyrussa*) Conservation for period 2013-2022;

In view of :

1. Law No. 5 of 1990 on the Conservation of Living Natural Resources and its Ecosystems which are a part of it (State Gazette of the Republic of

- Indonesia Number 49 of 1990, Supplement to the 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 (State Gazette of the Republic of Indonesia Number 41 of 1994, Supplement to the State Gazette of the Republic of Indonesia Number 3556);
 3. Law No. 41 of 1999 on Forestry (State Gazette of the Republic of Indonesia Number 167 of 1999, Supplement to the State Gazette of the Republic of Indonesia Number 3888) as amended by Law Number 19 of 2004 (State Gazette of the Republic of Indonesia Number 86 of 2004, Supplement to the 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 Number 125 of 2004, Supplement to the State Gazette of the Republic of Indonesia Number 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 the 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 the 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 the State Gazette of the Republic of Indonesia Number 5015);
 7. Government Regulation No. 7 of 1999 on the Preservation of Flora and Fauna Species (State Gazette of the Republic of Indonesia Number 14 of 1999, Supplement to the State Gazette of the Republic of Indonesia Number 3803);

8. Government Regulation No. 8 of 1999 on the Use of Wild Flora and Fauna (State Gazette of the Republic of Indonesia Number 15 of 1999, Supplement to the State Gazette of the Republic of Indonesia Number 3802);
9. Government Regulation No. 45 of 2004 on Forest Protection (State Gazette of the Republic of Indonesia Number 147 of 2004, Supplement to the 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 the State Gazette of the Republic of Indonesia Number 5056);
10. Government Regulation No. 6 of 2007, as amended by Government Regulation Number 3 of 2008, on Forest Designing and Forest Management Planning, also Forest Use (State Gazette of the Republic of Indonesia Number 16 of 2008, Supplement to the State Gazette of the Republic of Indonesia Number 4814);
11. Government Regulation No. 36 of 2010 on Nature Tourism Concession in Wildlife Reserves, National Parks, Grand Forest Parks and Nature Tourism Parks (State Gazette of the Republic of Indonesia Number 44 of 2010, Supplement to the State Gazette of the Republic of Indonesia Number 5116);
12. Government Regulation No. 28 of 2011 on the Management of Forest Reserves Area and Nature Conservation Areas (State Gazette of the Republic of Indonesia Number 56 of 2011, Supplement to the State Gazette of the Republic of Indonesia Number 5217);
13. Presidential Decree No. 43 of 1978 on tge Ratification of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora);
14. Minister of Forestry Decree No. 355/Kpts-II/2003 on the Identification of Wild Plant and Animal Specimens;

15. Minister of Forestry Decree No. 447/Kpts-II/2003 on the Administration Directive for Collecting, Capturing and Distribution of Wild Plant and Animal Specimens;
16. Minister of Forestry Regulation No. P.57/Menhut-II/2008 on Strategic Direction of the National Species Conservation 2008-2018;
17. Minister of Forestry Regulation No. P.40/Menhut-II/2010 on the Structure and Organization of the Ministry of Forestry (State Gazette of the Republic of Indonesia Number 405 of 2010) as amended by the Minister of Forestry Regulation No. P.33/Menhut-II/2012 (State Gazette of the Republic of Indonesia Number 779 of 2012);

HAS DECIDED:

To stipulate :

MINISTER OF FORESTRY REGULATION ON STRATEGY AND ACTION PLAN FOR BABIRUSA (*BABYROUSA BABYRUSSA*) CONSERVATION 2013-2022.

Article 1

The Strategy and Action Plan for Babirusa (*Babyrousa babyrusa*) Conservation 2013-2022, as mentioned in the attachment is an integral part of this regulation.

Article 2

The Strategy and Action Plan for ~~the~~ Babirusa (*Babyrousa babyrusa*) Conservation 2013-2022, as referred to in Article 1 is a framework for the arrangement of Babirusa (*Babyrousa babyrusa*) conservation programs.

Article 3

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

This Minister of Forestry Regulation will be promulgated with its placement in the official State Report of the Republic of Indonesia, so that every person be aware of the regulation.

Stipulated in Jakarta
on 30 October 2013
MINISTER OF FORESTRY
REPUBLIC OF INDONESIA,
Signed
ZULKIFLI HASAN

Enacted in Jakarta
on 4 November 2013
MINISTER OF LAW AND HUMAN RIGHTS
REPUBLIC OF INDONESIA,
Signed
AMIR SYAMSUDIN

STATE REPORT OF THE REPUBLIC OF INDONESIA NUMBER 1282 OF 2013
Certified to be a true copy of the original
HEAD OF LEGAL AND ORGANIZATION BUREAU
Signed
KRISNA RYA

APPENDIX

REGULATION OF THE MINISTER OF FORESTRY OF THE
REPUBLIC OF INDONESIA
NUMBER P.55/Menhut-II/2013

**THE STRATEGY AND ACTION PLAN FOR
BABIRUSA (*BABYROUSA BABYRUSSA*)
CONSERVATION
2013-2022**

CHAPTER I INTRODUCTION

A. Background

Babirusa are a genus of wild fauna with a unique morphology and possessing specific habitat requirements. The species also has a restricted distribution and is endemic to Sulawesi and Maluku. The unique morphology of babirusa includes a pelage consisting of sparse amount of hairs compared to other wild pig species. Males have long upper canines which pierce the flesh of the snout.

There are three surviving subspecies or species of babirusa (Groves, 2001; Groves and Meijaard, 2002). The Buru babirusa (*Babyrousa babyrussa babyrussa*) occurs on Buru Island to the east of Sulawesi. The Togian babirusa (*Babyrousa babyrussa togeanensis*) is endemic to four small islands in Central Sulawesi, namely Malenge, Talatakoh, Togean and Batudaka. Finally, there is the Sulawesi babirusa (*Babyrousa babyrussa celebensis*) which can be found in North Sulawesi, Central Sulawesi, the northern part of South Sulawesi and Southeast Sulawesi. Meanwhile *Babyrousa babyrussa bolabatuensis*, a subspecies of babirusa historically found in the southern part of the South Sulawesi Province has been declared extinct.

No comprehensive description has been made yet of wild babirusa populations. The conservation of this species faces serious threats, due to the decreasing and/or degrading of its habitat and poaching. Babirusa have been hunted traditionally by local communities around forest areas as a source of protein. Babirusa have been protected in Indonesia since 1931.

Due to continues decreases in populations, the IUCN (2008) listed the Buru Island babirusa (*Babyrousa babyrussa babyrussa*) as Vulnerable with category B1ab(iii); the Togian babirusa (*Babyrousa babyrussa toneanensis*) as Endangered with category B1ab(iii,v); C2a(i); and the Sulawesi babirusa (*Babyrousa babyrussa celebensis*) as Vulnerable with category A2cd; C1 (IUCN 2010). Babirusa have been included in CITES Appendix I since 1982.

In an effort to conserve babirusa, an internatinoal workshop called "Population and Habitat Viability Assessment" or PHVA was held in July 1996 at Taman Safari I Cisarua Bogor. The workshop was attended by 37 biologists and babirusa researchers, management authorities, managers of conservation areas and conservation institutions, wildlife conservation policy makers and IUCN representatives. The workshop aimed to formulate policy and recommendations for babirusa conservation. The resulting recommendations were divided into three strategic issues, namely the management of babirusa in their natural habitat, the management of babirusa in ex-situ conservation institutions and a babirusa population model.

In May 2009 a national workshop was organized in Manado to discuss the Strategy and Action Plan for Anoa and Babirusa Conservation. The workshop was attended by approximately 60 participants, which consisted of experts on biology/ forestry/ husbandry, researchers, managers of conservation areas, representatives from universities, national and regional governments, conservation institutions, and mining companies. The workshop aimed to: 1) collect information on the status and distribution of anoa and babirusa in Sulawesi and the surrounding islands which can be used in conservation planning; and 2) prepare a National Strategy and Action Plan for Babirusa Conservation (and Anoa in a separate document). The results of the workshop were to be disseminated through the Strategy and Action Plan for Babirusa Conservation 2013-2022.

B. Aim and Objective

The aim of the production of this Strategy and Action Plan for Babirusa Conservation 2013-2022 is to give direction to policies and act as a reference for developmental stakeholders, conservationists, universities, business entities, financial backers, mass media at the regional, national and international levels, and other stakeholders for the next 10 years.

The objective of the Strategy and Action Plan for Babirusa Conservation 2013-2022 is improved management of babirusa habitat and populations through the efficient and effective implementation of conservation programs involving multiple parties.

C. Scope

The scope of the Strategy and Action Plan for Babirusa Conservation in 2013-2022 includes the management of in-situ and ex-situ populations, habitat development, controlling poaching/trading, controlling deforestation/forest degradation and societal involvement in conservation efforts for babirusa in their natural habitat.

D. Vision, Mission and Target

1. Vision

The vision for babirusa conservation in 2022 is the realization of a stable and ecologically functioning babirusa population, by decreasing poaching and illegal trading, maintaining existing habitats and through the active involvement of stakeholders.

2. Mission

To achieve the vision of babirusa conservation in 2022, the following mission is formulated:

- a. To increase the control of poaching and illegal trade by improving security, law enforcement and public awareness.

- b. Safeguarding stable populations within the distribution of each babirusa species/subspecies.
- c. To improve habitat expansion and rehabilitation efforts.
- d. To improve the role of conservation institutions in supporting increases in wild populations.
- e. To improve public education and awareness.
- f. To increase inter-regional, inter-institutional/organizational and interdisciplinary cooperations and partnerships.
- g. To develop an information database and supporting system for conservation decision making.
- h. To provide sustainable funding for conservation.

3. Target

The babirusa conservation targets for 2022 are as follows:

- a. Realizing safe babirusa populations subject to minimum levels of poaching and illegal trade.
- b. Realizing a minimum of 13 stable babirusa populations in priority areas of natural habitat for each species/subspecies.
- c. Maintaining suitable babirusa habitat.
- d. Realizing support for wild populations by linking in-situ and ex-situ populations and ordering of the administration of the conservation institutions involved.
- e. The realization of a database to support decision making at all management levels concerned with babirusa conservation.
- f. Realizing increased appreciation of babirusa through education, communication and public awareness.

- g. The implementation of cooperation / partnerships with related institutions/ organizations to improve networks and institution performance.
- h. The availability of sustainable conservation funds to support babirusa conservation.

CHAPTER II

CURRENT CONDITION

A. Biology

1. Taxonomy and Morphology

Babirusa are a member of the *Suidae* family. The subfamily *Babyrousiniae* represents one of the oldest lineages of wild pigs, which separated from the warthog (subfamily *Phacochoerini*) lineage during the Oligocene era or early Miocene. The subfamily *Babyrousiniae* (Order *Artiodactyla*, Suborder *Suiformes*, family *Suidae*) contains a single genus. Research indicates that there are three subspecies (Groves, 1980) or three species (Groves and Meijaard, 2002), of babirusa, which can be distinguished based on geographic distribution, body size, body hair and the shape of the canine tusks in males. Historically, there were four babirusa subspecies, namely *Babyrousa babyrussa babyrussa* which can be found in Buru Island, *Babyrousa babyrussa celebensis* which can be found in the mainland of Sulawesi, *Babyrousa babyrussa togeanensis* which can be found in the Togeian Islands and *Babyrousa babyrussa bolabatuensis* found in South Sulawesi but the latter has been declared extinct (Groves, 1980). Groves (2001) and Groves and Meijaard (2002) have suggested that the four subspecies should be categorized as different species. The information on babirusa species/subspecies diversity forms the basis for the conservation efforts outlined in this Strategy and Action Plan which covers morphology, ecology and genetic diversity.

One of the unique morphological features of babirusa are the upper canine tusks in males that pierce through the snout and curve backwards. The tusks function as a weapon. Male and female babirusa can be differentiated by the presence or absence of visible tusks. The

body size of male babirusa is also relatively large compared to that of other wild pig species.

2. Diet

The natural diet of babirusa is yet to be clearly identified. There is very little observational data on feeding behaviour and the types of food chosen by babirusa in the wild (Leus, 1994; Clayton, 1996; MacDonald, 1993). Leus (1996) noted a list of plants including palmae growing in Sulawesi, which produce fruits eaten by babirusa.

The main diet of babirusa consists of various types of fruits (meaning it is frugivorous). Next to this, babirusa feed on roots and bamboo shoots, as well as mushrooms and fruits such as *dongi* (*Dillenia ochreatea*), *rao* (*Dracontomelon rao*) and *D. mangiferum*. One of its favorite fruits is the pangi fruit (*Pangium edule*). The strong canines and teeth of babirusa can easily crack hard-shelled nuts (Leus and Macdonald, unpublished observations). Nuts like walnuts (*Canarium (Burs.)*), oaks (*Lithocarpus (Burs.)*) and chestnuts (*Castanopsis (Burs.)*) are also available in the forests of Sulawesi (Leus, 1996).

Babirusa are often found wallowing and visiting mineral-rich water sources. Like other pig species, babirusa are omnivores; meaning that in addition to consuming plants, babirusa also consume other items including small animals such as small *ocia*, fish, birds and insects in small amounts. Sometimes babirusa are observed to forage on decaying logs, probably to obtain sources of animal protein such as caterpillars and worms, or to feed on other small animals (larva, worms or caterpillars) (Clayton, 1996). In conservation institutions, adult babirusa also feed on small mammals and birds.

3. Behavior and Reproduction

Babirusa are naturally shy animals, but can turn aggressive when disturbed. Babirusa usually live in small groups with the strongest male being the leader (Clayton, 1996). Babirusa are often observed walking

alone or in small groups with strong social bonds that increase protection from predators. Females build nests for their piglets made from various materials such as grass, rattan, leaves and branches. When travelling in groups, babirusa maintain frequent and reciprocal contact, characterized by a low and long sound *suirii...suuuuuiiriii*.

Babirusa have never been observed to sleep on top of piles of leaves. The species prefers to wallow in rather clean puddles instead of more muddy ones. In the dry season, babirusa are often observed wading in rivers. Babirusa are active both during the day and night. During the mating season males are often observed fighting and scent marking. The tusks of male babirusa function as a secondary sex characteristic that is used in combat (Clayton, 1996).

The homerange of babirusa is between 0.8 and 12.8 km² based on minimum convex polygons (Clayton, 1996). Babirusa live in groups of 5-6 individuals with a matriarchal social system, with older females determining the group's movement. Meanwhile adult males live mostly solitarily, accompanying females only during the mating season (Patry et.al., 1995; Clayton, 1996).

Information obtained from the field and observations in captivity show that babirusa live in social groups (Selmier, 1983; Patry et.al., 1995; Clayton, 1996). Groups generally consist of around 13 individuals, which gather around wet areas to wallow and use salt licks. Adult males usually accompany adult female individuals. Adult females can be observed spending time with other adults, but they are more often observed moving solitary with their piglets.

Both male and female babirusa reach sexual maturity at 5-10 months. Maximum longevity is around 23-24 years (Macdonald, 2008). The litter size is 1-2 individuals, with each piglet weighing around 0.715 kg (1.573 lbs). The gestation period is 155-158 days. The piglets rely on milk for 1

month before they are weaned and start to search for their own food in the forest. A female has one litter per year.



Image 1. Map of babirusa distribution

4. Population, Habitat and Distribution

a. Population

No comprehensive description has been made yet of babirusa populations in their natural habitat. Clayton et.al. (1997) stated that in-situ babirusa populations in the entire Sulawesi region number less than 5,000 individuals. There are an estimated 500 babirusa in the 32,000 hectare Nantu Game Preserve in Gorontalo, however their numbers are continuously declining due to the high frequency of forest destruction and poaching events (Clayton, 1996).

In December 2011 there were 80 babirusa (34 males, 43 females, and 3 individuals of unknown sex) located in several conservation institutions in Indonesia as listed in Table 1. Surabaya Zoo houses

the largest collection with 37 individuals, followed by Ragunan Zoo with 14 individuals. The ex-situ babirusa population should be managed in line with the IUCN guidelines (2002) and become part of a coordinated global/international breeding program to avoid inbreeding.

Table 1. Ex-situ babirusa population in Indonesia

(Data from December 2011)

NO	INSTITUTION	SEX			TOTAL
		♂	♀	?	
1	Surabaya Zoo	14	23	0	37
2	Bandung Tamansari Zoo	1	2	0	3
3	Pematangsiantar Animal Park	1	0	0	1
4	Ragunan Zoo	6	5	3	14
5	Unit I Indonesia Safari Park, Cisarua, Bogor	4	3	0	7
6	Unit II Indonesia Safari Park, Prigen	3	4	0	7
7	Bali Zoo	0	2	0	2
8	Bali Safari & Marine Park	5	4	0	9
	TOTAL	34	43	3	80

An international breeding program for babirusa can be of great value, serving as a back-up population in case of extinction of the species in the wild. In March 2010, data from international studbook keepers obtained from <http://app.isis.org/abstracts/abs.asp>, showed that there are two babirusa subspecies or species held in international conservation institutions. These consist of 65 individuals of *Babyrousa Babyrussa* (30.35.0), spread over conservation institutions in Europe, North America, Asia and 1 in South Africa. Next to this there are 47 individuals (20.26.1) of *Babyrousa celebensis*, which are held in various conservation institutions in North America.

Box 1: Ex-situ babirusa conservation program

Ex-situ conservation efforts aim to support viable populations which can retain their genetic diversity and minimize inbreeding. An ex-situ population aims to serve as a gene bank that is representative of the overall population of the species. Moreover, ex-situ populations can be used for reintroduction programs to support in-situ populations when needed.

In relation to the above, Frankham et.al., 2002 state that it is important to maintain approximately 90% of genetic diversity over a 100 year period to keep viable population levels. In order to reach viable levels of genetic diversity in babirusa, at least 60 founder individuals are needed, which will be bred up to a population of around 300 individuals. (IUCN Conservation Breeding Specialist Group)

Currently there are three species/subspecies of babirusa recognized based on genetics. Therefore the subspecies/species should be managed separately in 3 populations. This means that 300 individuals of each subspecies/species would be needed to reach viable ex-situ populations. A practical solution is needed to maintain and increase the current ex-situ population. Next to this, further studies on the taxonomy and genetics of wild babirusa are needed.

b. Habitat

Babirusa occur in lowland tropical rainforests. The species prefers forest areas where there are rivers and other water sources such as swamps and streams, which provide access to water and allow wallowing. Babirusa frequently visit water sources and salt licks to obtain minerals needed for digestion (Clayton, 1996). Historically, babirusa could be found in forest areas nearby beaches, but they are now mostly found deeper into the forests or into mountain areas less easily accessible to people. Babirusa are often observed wallowing in puddles with relatively clean water and little mud and can be observed wading in rivers during the dry season.

c. Distribution

The Babirusa are endemic to Sulawesi and several small surrounding islands such as the Togian Islands, Sula Islands and Buru Island in Maluku. The existence of babirusa in the latter two locations is most likely the result of introduction (Groves, 1980). The distribution of babirusa is severely restricted by the availability of suitable habitat. For example, in the northern part of Sulawesi, the species is found only in the western part of Bogani Nani Wartabone National Park and in the Nantu-Boliyohuto Game Preserve located in the Gorontalo Province. Babirusa populations are also found in the western area of the remaining forests in Randangan, located in the Pahuwato Regency of the Gorontalo Province. Next to this, there is a population in the Buol Toli-Toli region which makes up the western border of the northern part of Sulawesi. In Central Sulawesi, babirusa can be found in Lore Lindu National Park, Morowali Nature Reserve and in the Luwuk and Balantak regions of eastern Central Sulawesi. In South Sulawesi, babirusa can be found in the northern part of the forest areas bordering the province of Central Sulawesi. There is very little information on the presence of babirusa in Southeast Sulawesi.

In the Togean Islands, the Togeian babirusa (*Babyrousa babyrussa togeanensis*) can be found on four islands, namely Malenge, Talatakoh, Togeian and Batudaka Island. There are no records of babirusa on Una-una, Waleako and Waleabahi Island. Babirusa also occurs on Buru Island and Taliabi Island, but there is very little information on the status of these populations (Selmier, 1983; Ito et al., 2005; Ito et al., 2008).

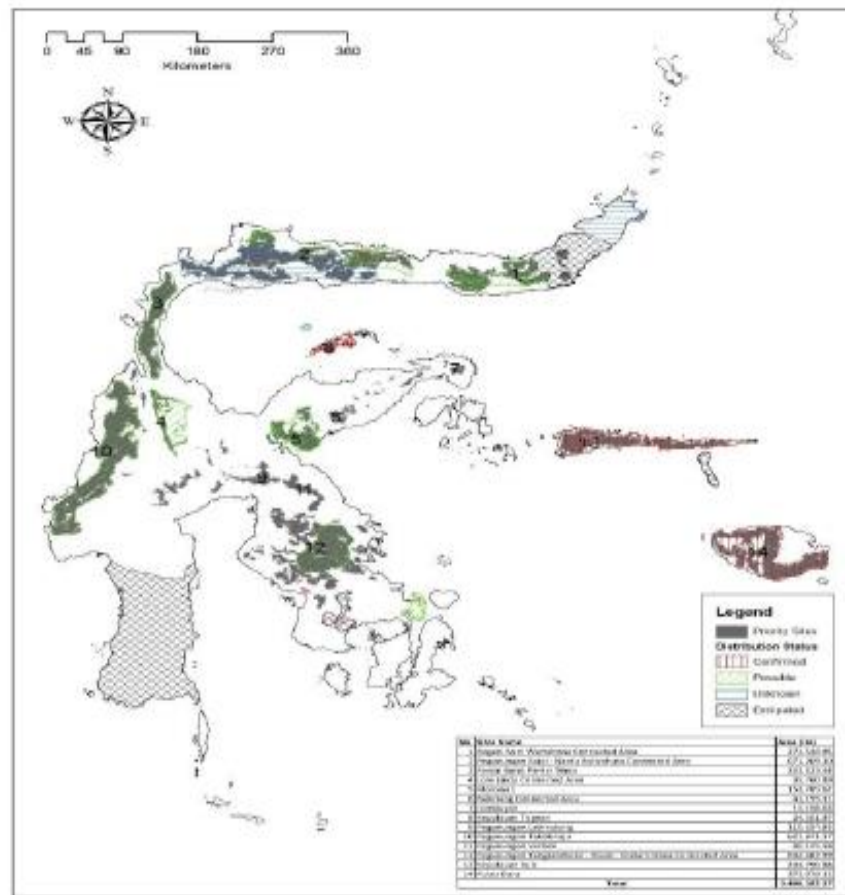


Image 2. Important Areas of Babirusa Distribution on mainland Sulawesi, Togeang Islands, Sula Islands and Buru Island in Maluku

In order to increase the effectiveness of babirusa habitat and population management, conservation priority areas have to be determined for the next ten years. These priority areas are determined based on: a) presence of babirusa species/subspecies b). forest coverage and connectivity between forested areas, c) status/unit of area management (National Park, BKSDA, Protected Forest, etc.) which are spread over several regions (Table 2).

Table 2. Primary priority areas for the management of babirusa populations and habitat on Sulawesi, the Togean Islands, Sula Islands and Buru Island in Maluku.

Province/Region	Forest Area
Northern Sulawesi and Gorontalo	1. Bogani Nani Wartabone Connected Area 2. Sojol – Nantu Mountain Connected Area
Central and Eastern Sulawesi	1. Togean Islands 2. West Coast and East Coast 3. Lore Lindu Connected Area 4. Morowali 5. Bakiriang Connected Area 6. Lombuyan
Western Sulawesi	1. Latimojong Mountain 2. Takolekaju Mountain
Southeastern Sulawesi	Tangkeleboke-Abuki-Matarombea Mountain Connected Area
Northern Maluku	Sula Islands
Maluku	Buru Island

d. Threat

Poaching is the biggest threat to the conservation of babirusa. Although protected by law, poaching levels are still high because of weak law enforcement and the large size of the illegal wildlife trade. (Clayton et.al., 1997, Clayton and Milner-Gulland, 2000). Other threats include deforestation and habitat degradation. Next to this, the small number of piglets born per litter makes the species vulnerable to exploitation (Ito et.al., 2005, Ito et.al., 2008).



Image 3. Security measurements against illegal gold mining in the Paguyaman River area (source: Adudu Nantu Foundation)



Image 4. Illegally sourced Anoa and babirusa (source: Adudu Nantu Foundation)

Box 2. Poaching of wild babirusa

The poaching of babirusa has been traditionally conducted using snare traps and active hunts with dogs. Snaring or trapping is carried out by placing snares and traps at locations babirusa are known to visit. These traditional hunting strategies have proven so effective in catching babirusa that they have had a large negative impact on populations.

The trade of babirusa meat is still conducted in several places in Sulawesi, especially in North Sulawesi. Increasing poaching levels have caused the babirusa population to decline continuously, with only an estimated 4,000 individuals left. In 1991 the illegal trade in babirusa meat reached 15 individuals per week. More recently, observations conducted by Clayton (2008-2009) in Langowan traditional market in North Sulawesi, indicated a total of between 0-7 babirusa traded with an average of 3 babirusa per day.

CHAPTER III
STRATEGY AND ACTION PLAN FOR BABIRUSA CONSERVATION
2013-2022

The production of the guidelines in this Strategy and Action Plan for Babirusa Conservation 2013-2022 is aimed at safeguarding the long term survival of babirusa in their natural habitat. In order to reach the stated objective, the following strategies and programs are stipulated:

A. Poaching and illegal trading control

Strategy : Reducing the poaching and trade of babirusa through increased law enforcement and awareness in society.

Target : The poaching and illegal trade of wild babirusa is controlled both inside and outside of conservation areas.

The actions planned to be performed are as follows.

1. Identification of hunting groups and nodes of babirusa poaching and trading activities.
2. Terminating babirusa trading channels through intelligence activities and law enforcement.
3. Intensive patrolling using standardized methods which are performed regularly and act as a control against habitat disturbance and the poaching and trading of babirusa.
4. Formation of voluntary teams/groups whose duty it is to control babirusa poaching and trading.

Poaching is one of the main factors causing population decreases. Therefore, an integrated program is needed operating cross-sectorally (Ditjen PHKA, Councils/National Park Council/BKSDA, Province Government, Regency/City Government, National Police, Attorney and

Judiciary) and cross-regionally with intensive cooperation at the provincial, regency and city administration level. Law enforcement activities related to babirusa poaching and trading are performed to educate and act as a deterrent against perpetrators. Moreover, the people's awareness and concern towards babirusa conservation must be improved.

B. Improving the management of babirusa populations in their natural habitat

Strategy : Maintaining stable babirusa populations in their natural habitat.

Target : The realization of stable babirusa populations in priority areas.

The actions planned to be performed from 2013-2022 related to population and distribution data are as follows:

1. Developing survey standards and monitoring of babirusa populations.
2. To perform thorough surveys (island-wide surveys) of babirusa populations and their distribution on Sulawesi, the Togian Islands, Sula Islands and Buru Island.
3. To perform ecological, biological and behavioral research on babirusa.
4. To determine the taxonomic status or the number of babirusa species/subspecies occurring in the wild.
5. To maintain a minimum of 13 stable babirusa populations, meaning one stable population in each of the regions in Sulawesi, Togian Islands, Sula Islands and Buru Island in Maluku where a subspecies/species occurs.

Population management is performed to maintain stable babirusa populations in their natural habitat. In order to maintain stable populations, sufficient habitat must be available and sufficiently large population sizes are required in each area containing populations or sub-populations of babirusa in the northern, central, western, southern and southeastern part of Sulawesi. To achieve this, firstly the current condition and distribution of

babirusa populations on Sulawesi must be understood through the use of standardized methods. This includes populations on the Sula and Togian Islands. It is expected that in 2015 the total number of babirusa populations in Sulawesi, their distribution and taxonomic status are known.

C. Improving the management of babirusa habitat

Strategy : Reducing habitat degradation through law enforcement and increased awareness in society. Next to this, habitat corridors must be developed to restore optimum carrying capacity.

Target : The availability of suitable habitat for babirusa (availability of food, water and protection).

The actions planned to be performed:

1. Maintaining existing habitats through:
 - a. Identification of habitats suitable for babirusa, within or outside of conservation areas.
 - b. Law enforcement activities focussed on perpetrators of encroachment, illegal logging and other illegal activities.
 - c. Routine monitoring and patrolling of areas using standardized methods and involving members of society concerned with babirusa conservation and volunteer forest rangers.
 - d. The improvement of the awareness of society towards the conservation of babirusa habitat.
2. Improving the quality of babirusa habitat through:
 - a. Rehabilitation and restoration of damaged and fragmented habitat.
 - b. Creating corridors between fragmented babirusa habitats.

Threats to babirusa conservation also occur as a result of pressure on its natural habitat. The condition of babirusa habitat is continuously deteriorating (decreasing), experiencing both destruction and fragmentation.

Various developmental activities including extensive plantations, infrastructure and illegal mining have caused the destruction of babirusa habitat. This includes illegal activities taking place in conservation areas, such as encroachment, illegal logging, poaching and many other activities. As a consequence, the carrying capacity of habitat decreases and the populations of babirusa become fragmented into small sub-populations, highly vulnerable to extinction.

D. Improvement of the role of conservation institutions

Strategy : To improve the role of conservation institutions in supporting babirusa conservation efforts.

Target : Realizing support for wild population management. (in-situ and ex-situ links).

The actions planned to be performed in relation to the capacity of conservation institutions in babirusa conservation are:

1. Appointing trained and experienced babirusa Studbook Keepers in Indonesia.
2. Creating a conservation assessment management plan (CAMP) and breeding babirusa at conservation institutions.
3. Creating a global captive management plan for babirusa at the national and international level.
4. Optimizing the function of babirusa Animal Rehabilitation Centers (PRS) in areas with sub-populations to rehabilitate confiscated babirusa and/or individuals returned by private individuals.
5. Campaigning and promoting babirusa conservation institutions as ecotourism destinations, both for domestic and international tourists, in areas with babirusa populations.

Ex-situ babirusa populations will function as a backup for in-situ babirusa populations and support babirusa conservation activities. Moreover, ex-situ

babirusa will function as a medium for public education and ex-situ research. Ex-situ and in-situ conservation programs must be performed sustainably and in synergy. The connectivity between ex-situ and in-situ conservation forms an important strategic direction and will at least cover:

1. Ex-situ conservation performed by Conservation Institutions possessing the necessary permits from authorized institutions.
2. Breeding programs for priority species/subspecies to support in-situ populations when required (ex-situ to in-situ link).
3. Ex-situ conservation aimed at animal rescue conducted in line with IUCN Guidelines for the Placement of Confiscated Animals.

Ex-situ conservation aimed at supplementing in-situ populations (restocking) will require separate regulations providing clear directions in line with the provisions and requirements for release.

E. Establishment of a database and supporting system for decision making

Strategy : Establishing a babirusa conservation database and developing a Management Information System (MIS) which is transparent, accountable, participative, and collaborative with various stakeholders.

Target : Availability of a basic and supporting data system for decision making at all management levels.

The actions planned to be performed are as follows:

1. Establishing a babirusa conservation database and a supporting system for decision making.
2. Developing networks between domestic and international stakeholders, specifically in providing data and information related to babirusa conservation.

This program aims to provide accurate, accountable, transparent and accessible data and information related to babirusa conservation that is easily accessible to multiple parties and can form the basis for formulating policy and development programs. Through this program networks can be formed including various parties such as citizens and babirusa experts. In this way information related to babirusa conservation can always be available and shared voluntarily. The data and information will be distributed using printed and electronic media. Through these activities it is hoped that awareness will develop in society related to conservation and active participation will take place, especially for babirusa conservation but also for endemic Wallacean wildlife in general.

F. Public education, communication and awareness

Strategy : Improving the awareness of the public and stakeholders to increase commitment to the importance of babirusa conservation.

Target : The implementation of public education, communication and awareness activities.

The actions planned to be performed are:

1. Performing the training of relevant skills with the staff of National Parks and KSDA, as well as communities and other stakeholders.
2. To provide counseling and conduct promotional actions highlighting the importance of babirusa conservation and the pride of communities and students around babirusa habitat towards the conservation of babirusa.
3. Distributing information on babirusa conservation through various media (leaflets, books, magazines, posters, program CDs, webs, etc.).

Through communication and public awareness, communities will change their mindset and public awareness will develop on the importance of environmental conservation, especially the conservation of endemic Wallacean animals and babirusa. This includes the availability of

manpower/staff with high capacity and standards in performing babirusa conservation obtained through education and training.

G. Development of cooperations and partnerships

Strategy Expanding partnerships and improving cooperation between related parties in order to support babirusa conservation.

Target The implementation of cooperation/ partnerships with related institutions or organizations.

The actions planned to be performed are as follows.

1. Babirusa Forum

- a. Performing the monitoring and evaluation of the implementation of the Strategy and Action Plan.
- b. Encourage cooperation between donors, universities, research institutions, etc. within and outside of the country related to babirusa conservation.
- c. Developing networks consisting of multiple parties, both from the government and non-government that are concerned with babirusa conservation. This includes networking between babirusa researchers/experts.

2. Local customs and regulations

- a. Arranging village regulations/customs for the conservation of babirusa.
- b. Strengthening the functioning of customary systems for for babirusa conservation.

Conservation efforts will not only become the responsibility of technical institutions (Council/KSDA Council/National Park), consisting of government officials at the regional level that act as regulators, facilitators and

supervisors, it will also require the support from other parties to implement field activities.

In-situ and ex-situ conservation activities require support from third parties such as business entities, NGOs, universities and other society groups. Therefore, the implementation of babirusa conservation programs will require cooperation and/or partnerships between technical institutions, provincial governments, regency/city governments and third parties.

H. Sustainable funding

Strategy : Improving and emphasizing the role of the national government, provincial governments, regency/city governments and NGOs in searching for institutional support, within and outside of the country, to fund babirusa conservation efforts.

Target : Availability of sustainable conservation funding.

The actions planned to be performed:

1. Establishing the role of provincial governments, regency/city governments in babirusa conservation by providing funding in the Regional Budgets (APBD).
2. Provincial governments, regency/city governments include babirusa conservation efforts in the Regional Strategic Plan and in the Regional Budget (APBD).

Commitment to babirusa funding

1. Establishing an endowment fund for babirusa conservation.
2. Encouraging companies/NGOs to perform ecosystem restoration in priority areas for babirusa conservation.
3. Mobilizing funds from various sources within and outside of the country, both governmental (national, provincial and regency/city) and non-governmental (business entity, societal institutions, donor organizations and individuals).

4. Integrating species conservation activities with programs such as CSR, REDD+, environmental services, nature tourism, donor programs and other similar sources in babirusa priority areas.

Babirusa conservation must become the responsibility of all stakeholders. Babirusa conservation programs can succeed if there is an increase in support and assertiveness from the national, provincial and regency/city governments, as well as from business entities, societal organizations, donor organizations and individuals. The government has the role of main stakeholder and regulator. As the animal ambassador of Sulawesi, the provincial governments and regency/city governments have important roles to play in supporting babirusa conservation activities by allocating routine funds and creating the Regional Budget. The stakeholders must support each other and cooperate in looking for funds and in establishing an endowment fund for babirusa conservation.

CHAPTER IV
LOGICAL FRAMEWORK AND TIMEFRAME
STRATEGY AND ACTION PLAN FOR BABIRUSA CONSERVATION 2013-2022

Table 3. Logical framework for the strategy and action plan for babirusa conservation 2013-2022

No	Program	Target	Activity	Success Indicator	Time Frame	Party in Charge
1	Controlling poaching and illegal trade	Control of poaching and illegal trade in babirusa habitat, within and outside of conservation areas	Identification of hunting groups and activity nodes of babirusa poaching and trade	Availability of data and mapping communities which perform babirusa poaching and trading activities	2014-2017	Ditjen PHKA, Council/National Park Council/BKSDA, Universities, Forest R&D, NGO
			Terminating babirusa trading channels through intelligence activities and law enforcement	<ul style="list-style-type: none"> - The increase in awareness on the legal position of babirusa poaching and trading and the increase in the number perpetrators that are legally processed and/or deterred - The termination of 	2013-2022	Ditjen PHKA, Council/National Park Council/BKSDA, Provincial and Regency/City Governments, Police, law officers, NGO, society

				babirusa trading channel links.		
			Intensive patrolling which is performed regularly as a control measurement against habitat disturbance and poaching and trading	Establishment of a database with information related to habitat disturbance; a decrease in poaching activities of 75%, as well as significant decreases in the hunting of populations and the destruction of habitat.	2013-2022	Ditjen PHKA, Council/National Park Council/BKSDA, Provincial and Regency/City Governments, NGO, society
			Formation of voluntary teams/groups whose duty it is to control babirusa poaching and trade	Increased awareness and concern in society towards babirusa conservation through the formation of volunteer babirusa conservation teams/groups	2013-2016	Ditjen PHKA, Council/National Park Council/BKSDA, Provincial and Regency/City Governments, NGO, society
2	Improving the management of	The realization of stable babirusa	To perform thorough surveys (island-wide	- There is a standardized babirusa	2013	Ditjen PHKA, Council/National

	babirusa populations in their natural habitat	populations in priority areas	surveys) on the populations and distribution of babirusa in Sulawesi, Togian Islands, Sula Islands and Buru Island	survey and monitoring protocol, to be used in all babirusa habitat areas. – Populations and distribution of babirusa are known and will be updated for a minimum of once every 5 years	2013-2022	Park Council/BKSDA, Universities, LIPI, Forest R&D, NGO
			To perform ecological, biological and behavioral research on babirusa (habitat, home range, population dynamics, habitat carrying capacity, food potential and feeding behavior) including population parameters (birth, mortality, sex ratio, age structure, etc.)	The ecology, biology including population parameters and behavior of babirusa are known	2013-2015	Universities, PHKA, Ditjen PHKA, Council/National Park Council/BKSDA LIPI, Forest R&D, Universities, NGO
			To determine the taxonomic status or the	– Assessment of species and subspecies in their	2013-2015	Ditjen PHKA, Council/National

			number of wild babirusa species/sub-species.	natural habitat Distribution and the number of babirusa species/subspecies is known – The population structure is known and gene mapping is conducted.		Park Council/BKSDA, Universities, Research Organization/Institution, NGO
			To maintain a minimum of 13 stable babirusa populations, with one stable population in each region in Sulawesi, Togian Islands, Sula Islands and Buru Island in Maluku where the species occurs	There are a minimum of 13 areas with stable babirusa populations which are managed intensively and effectively to be observed from a decrease in the rate of habitat degradation, encroachment and other illegal activities in the relevant areas	2013-2022	Ditjen PHKA, Council/National Park Council/BKSDA, Provincial and Regency/City Governments, NGO, society
3	Improving the management of	The availability of suitable habitat for	Maintaining existing habitat:			

	babirusa habitat	babirusa (availability of food, water and protection)	<ul style="list-style-type: none"> - Identification of habitats suitable for babirusa, within and outside of conservation areas 	<ul style="list-style-type: none"> - Forest areas that are babirusa habitat are identified and known - Habitat preferences of babirusa are known 	2013-2017	Ditjen PHKA, Council/National Park Council/BKSDA, Universities, Research Organization, NGO
			<ul style="list-style-type: none"> - Law enforcement activities against perpetrators of encroachment, illegal logging and other illegal activities are conducted, as well as activities related to awareness of the law 	Perpetrators of illegal logging, encroachment, illegal farming and forest destruction are legally processed and given just sentences.	2013-2022	Ditjen PHKA, Council/National Park Council/BKSDA, Police and other law enforcers, NGO
			<ul style="list-style-type: none"> - Routine monitoring and patrolling of areas using standardized methods and involving volunteer forest 	Routine patrols and the formation of volunteer forest rangers for babirusa conservation	2013-2022	Ditjen PHKA, Council/National Park Council/BKSDA, Provincial and

			rangers and members of local society who are concerned about babirusa			Regency/City Governments, NGO, society
			– Improvement of the awareness in society and concern about the conservation of babirusa habitat	People are actively participating in babirusa conservation	2013-2022	Ditjen PHKA, Council/National Park Council/BKSDA, Provincial and Regency/City Governments, University, NGO, society
			Improving habitat quality			
			– Rehabilitation and restoration of damaged and fragmented habitat	Improvement of the carrying capacity of babirusa habitat, especially in priority areas	2013-2018	Ditjen PHKA, Council/National Park Council/BKSDA, Provincial and Regency/City Governments, University, NGO,

						society
			– Creating corridors between fragmented babirusa habitat areas	Exchange between fragmented babirusa populations, especially in priority areas	2015-2022	Ditjen PHKA, Council/National Park Council/BKSDA, Provincial and Regency/City Governments, University, NGO, business entity
4	Improvement of the role of conservation institutions	The realization of population management support in nature (in-situ and ex-situ links)	Appointing a trained and experienced babirusa Studbook Keeper in Indonesia	Babirusa Studbook Keeper is appointed	2013	Ditjen PHKA, BKSDA, PKBSI, conservation organization
			Arranging a conservation assessment management plan (CAMP), as well as the breeding of babirusa species in conservation institution units	– There are management planning documents and documents for the assessment of babirusa conservation in conservation institutions.	2013-2015	Ditjen PHKA, Council/KSDA Council, PKBSI, conservation organization

				<ul style="list-style-type: none"> - Increasing the ex-situ population to support wild populations - Improvement of the orderliness of administration and management in conservation institutions 		
			Compiling a captive management plan for the national level	Roadmap for planning global babirusa captive breeding activities at the national and international level approved by all parties	2013-2015	Ditjen PHKA, PKBSI, conservation institution, University, research organization
			Optimizing the function of babirusa Animal Rehabilitation Centers (PRS) in subpopulation areas to rehabilitate confiscated babirusa	Babirusa Animal Rehabilitation Centers (PRS) in subpopulation areas to rehabilitate confiscated babirusa and/or babirusa returned	2013-2015	Ditjen PHKA, Council/ BKSDA Council, Provincial and Regency/City Governments,

			and/or babirusa returned by private individuals.	by private individuals operate optimally in line with national and international criteria.		NGO, University, conservation institution, PPS Tasikoki Bitung
			Campaigning and promoting babirusa conservation institutions as leading ecotourism destinations in subpopulation areas, both for domestic and international tourists	Nature tourism visits in each location to reach a minimum of 100 visitors/year in the first 5 years	2013-2017	Ditjen PHKA, Council/ BKSDA Council, Provincial and Regency/City Governments, conservation institution, PPS Tasikoki Bitung
5	Establishment of a database and supporting system for decision making	Availability of database and supporting system for decision making at all management levels	Establishment of a database and supporting system for decision making	Availability of a database and supporting system for decision making at all management levels	2013	Ditjen PHKA, Council/National Park Council/BKSDA, University, research institution, NGO
			Establishing a multi-party network between	– Establishing a network of multiple parties for	2013	Ditjen PHKA, Council/National

			domestic and international stakeholders, specifically in the provisioning of data and information related to babirusa conservation	babirusa conservation Establishing a system for sharing data and information related to babirusa conservation between stakeholders		Park Council/BKSDA, Provincial and Regency/City Governments, NGO, business entity
6	Public education, communication and awareness	The implementation of public education, communication and awareness	To perform the training of skills to the staff of National Parks and KSDA, communities and other stakeholders	<ul style="list-style-type: none"> - Communities around conservation areas have skills relevant to babirusa conservation efforts (species identification, guide or interpreter for ecotourism, etc.) - Implementation of education and training (intelligence, law enforcement, species identification, monitoring and survey (MIST), inventorying 	2013-2022	Counseling and development board for education and training, Ditjen PHKA, Council/BKSDA Council/National Park, University, NGO

				and data analysis, handling injured/ill animals, ex-situ management, studbook keeping, etc.)		
			To provide awareness raising and perform actions promoting the value of babirusa conservation and the pride of communities and students living around babirusa habitat towards babirusa conservation	<ul style="list-style-type: none"> - Guidelines/materials for awareness raising are available - Knowledge and appreciation possessed by students and communities relating to the importance babirusa conservation is increased. 	2013-2022	Counseling and development board for education and training, Ditjen PHKA, Council/BKSDA Council/National Park, Provincial and Regency/City Governments, University, NGO
			To produce various kinds of media to distribute information on babirusa conservation (leaflets,	Availability and spreading of information on babirusa conservation	2013-2022	Ditjen PHKA, Council/BKSDA Council/National Park, Provincial

			books, magazines, posters, program CDs, webs, etc.)			and Regency/City Governments, NGO
7	Development of cooperations and partnerships	The implementation of cooperation/ partnerships with related institutions/ organizations through expansion of partnerships and by improving the cooperation between related parties to support babirusa conservation.	Babirusa Forum:			
			– Performing monitoring and evaluation of the implementation of the Strategy and Action Plan for Babirusa Conservation	Implementation of monitoring and evaluation of the Strategy and Action Plan for a minimum of once every 2 years	2013-2022	Ditjen PHKA, Council/BKSDA Council/National Park, NGO
			– Encouraging cooperation from donors, universities, research institutions, etc. within and outside of the country related to babirusa conservation	Establishment of cooperations with stakeholders related to babirusa conservation	2013-2022	Ditjen PHKA, Council/BKSDA Council/National Park, Provincial and Regency/City Governments, NGO, private institution
			– Developing networks consisting of multiple parties, both governmental and non-	Formation of a group consisting of experts and observers of Indonesian babirusa in the shape of a	2013-2015	Ditjen PHKA, Council/BKSDA Council/National Park, Provincial

			governmental who are concerned with babirusa conservation, including networking between babirusa researchers/experts	forum		and Regency/City Governments, NGO, private institution
			Local customs and regulations:			
			– Arranging village regulations/ customs for babirusa conservation	There are village customs/ regulations for babirusa conservation	2014-2016	PHKA, Provincial and Regency/City Governments, Customs Institution, Society
			– Strengthening the function of customs and local organizational forms for the conservation of babirusa	The functioning of customs and local organizational forms for babirusa conservation.	2014-2016	PHKA, Provincial and Regency/City Governments, Customs Institution, Society
8	Sustainable funding	Availability of sustainable conservation	Establishing the role of provincial governments and regency/city			

		funding support by improving and emphasizing the roles of national, provincial, reGENCY/city governments and NGOs in searching for institutional support within and outside of the country to provide funding for babirusa conservation	governments in babirusa conservation by providing conservation funding in the Regional Budget (APBD)			
			– Provincial governments and reGENCY/city governments include babirusa conservation efforts in the regional strategic plan and in the Regional Budget (APBD)	Nine (9) reGencies include babirusa conservation in the regional strategic plan and Regional Budget (APBD)	2014-2022	Provincial and ReGENCY/City Governments
			Commitment to babirusa funds			
			– Establishing an endowment fund for babirusa conservation	Management of endowment fund for babirusa conservation	2013-2022	Ditjen PHKA, Provincial and ReGENCY/City Governments, NGO, AWCSG
			– Encouraging	The beginning of	2013-2022	Ditjen PHKA,

			companies/NGOs to perform ecosystem restoration in priority areas for babirusa conservation.	ecosystem restoration activities in babirusa priority habitats outside of conservation areas.		Ditjen BUK, Provincial and Regency/City Governments, NGO, private
			– Fund mobilization from various sources within and outside of the country, both governmental (national, provincial and regency/city) and non-governmental (business entities, societal institutions, donor organizations and individuals)	Implementation of babirusa conservation activities with the support from stakeholders	2013-2022	Ditjen PHKA, Ditjen BUK, Provincial and Regency/City Governments, NGO, private
			– Performing the integration of species conservation activities with programs such as CSR, REDD+,	Funding from CSR, REDD+, environmental services ,nature tourism and donor programs is allocated to support	2014-2022	Private, Provincial and Regency/City Governments, NGO, AWCSG

			environmental services nature tourism, donor programs and other similar programs in priority areas for babirusa conservation	babirusa conservation		
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**Certified to be a true copy of the original
HEAD OF LEGAL AND ORGANIZATION BUREAU,**

**Signed
KRISNA RYA**

**MINISTER OF FORESTRY
REPUBLIC OF INDONESIA,**

**Signed
ZULKIFLI HASAN**