REPORT ON A SECOND HABITAT ASSESSMENT FOR THE JAVAN RHINOCEROS (*RHINOCEROS SONDAICUS SONDAICUS*) WITHIN THE ISLAND OF JAVA

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Report on a Second Habitat Assessment for the Javan Rhinoceros (*Rhinoceros sondaicus sondaicus*) within the Island of Java

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Acronyms

AREAS	Asian Rhino and Elephant Action Strategy Program
ARP	Asian Rhino Project
CBM	Center for Biodiversity Management, Australia
FAO	Food and Agriculture Organization, Rome
GHNP	Gunung Halimun National Park
IRF	International Rhino Foundation, Yulee, FL, USA
IUCN	International Union for the Conservation of Nature
LIPI	*Lembaga Ilmu Pengetahuan Indonesia* (Indonesian Institute of Science)
MDS	Multi-Dimensional Scaling
NP	National Park
PFC	Plant Functional Complexity
PFT	Plant Functional Type
PHKA	*Perlindungan Hutan dan Konservasi Alam* (Forest Protection and Nature Conservation
PPA	*Perlindungan dan Pengawetan Alam* (Protection and Conservation of Nature)
RPU	Rhino Protection Unit
SRTM	Shuttle Radar Topography Mission
UKNP	Ujung Kulon National Park
WWF	Worldwide Fund for Nature
YABI	Yayasan Badak Indonesia (Indonesian Rhino Foundation)

REPORT ON A SECOND HABITAT ASSESSMENT FOR THE JAVAN RHINOCEROS (*RHINOCEROS SONDAICUS SONDAICUS*) WITHIN THE ISLAND OF JAVA

1. EXECUTIVE SUMMARY

1.1 Background

The Critically Endangered[1] Javan rhinoceros (*Rhinoceros sondaicus*) is one of the most threatened of all land mammals and the rarest of the five rhino species. It survives in two small populations: 35-50 in a reproducing population in West Java's Ujung Kulon National Park (UKNP), and fewer than six animals in a non-reproducing population in Cat Tien National Park in Vietnam.

Following the implementation of the 2007 *Strategy and Action Plan for the Conservation of Rhinos in Indonesia*, a meeting was convened on 9 May 2008 to assess progress of the conservation strategy for the Javan rhino in Ujung Kulon National Park and to set immediate goals and actions. Whereas it was formerly believed that Ujung Kulon had the holding capacity for more than 100 Javan rhino, today it is suggested that the park's carrying capacity has diminished to as low as 70 due to habitat changes and possible food competition. One of the strategies outlined in the 2007 action plan was to relocate a second population of Javan rhino to another area in order to increase carrying capacity and to sustain overall health of the population. At the 9 May 2008 meeting, it was agreed that habitat surveys, along with a rhino and banteng census, are an immediate priority. It was also agreed that the habitat assessments for both Ujung Kulon National Park (UKNP) and possible second habitat-relocation sites outside Ujung Kulon peninsula should be carried out by an independent agency to ensure critical information would be unbiased. This independent agent would be required to present the results to a board of reviewers consisting of the Indonesian Ministry of Forestry, Rhino Task Force, Scientific authority (the Indonesian Institute of Sciences or *Lembaga Ilmu Pengetahuan Indonesia* -LIPI) and rhino NGOs (the Indonesian Rhino Foundation or *Yayasan Badak Indonesia* – YABI, the World Wide Fund for Nature - WWF, the International Rhino Foundation - IRF, and BirdLife Indonesia or *Burung Indonesia*). This report presents findings from a field survey of Ujung Kulon peninsula and proposed relocation sites on the island of Java in Gunung Honje, Gunung Halimun, Masigit Kareumbi and Leuweung Sancang.

1.2 Methodology

To sustainably manage targeted elements of the biota requires appropriate baseline information. To this end, sampling should include those key elements of the biophysical

[1] www.iucnredlist.org

environment that influence the range distributions and behavior of the species in question. For this study, environmental gradient-based (gradsect) survey design was coupled with a comprehensive plant-based recording protocol (VegClass) that also included key attributes of site physical features as well as plant species, plant functional types (PFTs) and vegetation structure. As part of the gradsect procedure, environmentally representative sites (40 x 5m transects) were located initially through an inspection of available vegetation maps, previous reports and satellite imagery. Transects were then located on ground so that they traversed a range of known rhino habitat preference from low to high. All data were spatially referenced to facilitate mapping and spatial modeling of habitat pattern. A team made up of YABI, WWF and IRF personnel accompanied by an expatriate consultant surveyed these areas, and a core YABI Rhino Protection Unit (RPU) group was present at each survey. In each survey and at each study site, a member of the RPU team well-experienced in rhino habitat assessment was asked to provide a habitat preference score (1-10) based on an intuitive assessment of all habitat criteria. Each transect site was comprehensively photographed. Additional information on site features critical to Javan rhino habitat preference was recorded, as well as levels of browsing impact. To facilitate comparative analysis, the same methodology was uniformly applied to an 'orientation' survey of known rhino habitat in the peninsula of Ujung Kulon National Park (UKNP - 7 transects) followed by on-ground surveys of potential habitat in adjacent Gunung Honje (17 transects) and subsequently Gunung Halimun National Park (GHNP - 8 transects). As well as biophysical elements, in-depth socioeconomic interviews were conducted in villages surrounding Gunung Honje and at Ciusul in GHNP. Biophysical field data were compiled in industry standard format and analyzed using standard statistical regression and multivariate procedures. Suggested alternative areas in Masigit Kareumbi and Leuweung Sancang were examined using available remotely sensed imagery.

1.3 Results of data analysis

Plant-based predictors of rhino habitat preference: plant diversity or richness (number of species and plant-functional types – PFTs per transect) is negatively correlated with rhino habitat preference score as is plant litter depth. Ecological diversity measures for PFTs (Shannon H`, Simpson's and Fisher's Alpha), although statistically significant, were only weakly correlated with habitat preference. Two key vegetation structural variables, mean canopy height and basal area are not significantly correlated whereas there is a significant ($P < 0.0001$) quadratic relationship between rhino score and the ratio of projective foliage cover of woody to non-woody plants that is consistent with observed habitat preference for intermediate levels of disturbance. While elevation is negatively correlated with rhino score, other site features such as slope percent and aspect are not statistically significant. Individual plant-based variables, although statistically significant, are only of marginal value as estimators of rhino habitat preference. On the other hand, specific combinations of plant variables such as species and PFT richness, Plant Functional Complexity (PFC) and basal area, show strong non-linear correlation with rhino habitat scores. At the time of writing, the team was unable to explore predictive linkages between rhino score and remotely-sensed variables (Landsat, SRTM). Of general ecological interest is the fact that plant species and PFT diversity is surprisingly low in inland lowland peninsula UKNP (~ 20 species and 17 PFTs per 200m^2) and moderately low (~ 38 species, 25 PFTs) in Gunung Honje and

somewhat higher (57 species, 43 PFTs) in GHNP. By comparison, 200m² transects in lowland Jambi and Riau Provinces in Sumatra commonly contain more than 120 species and 80 PFTs. Presented with these facts, one may speculate that unusually low plant diversity in the areas currently occupied by Javan rhino may be a result of previous devastation caused by the eruption of Krakatau and subsequent reinvasion from shoreline plant gene pools. In UKNP inland lowland sites, this is supported by unusually high numbers of genera that are more commonly associated with littoral habitats.

1.4 Spatial modeling of habitat preference

Spatial analysis using key physical variables (geology, soil type, land cover, proximity to water, proximity to village) suggests a high percentage of areas in peninsula UKNP and Gunung Honje suitable for Javan rhinos. Modeling using DOMAIN potential mapping procedures also highlight a significant number of areas suitable for Javan rhino management. While generally indicative, neither of these approaches includes other key variables such as conditions suitable for maintaining long-term wallows or access to mineral salt sources. As such, output from these initial models should be viewed with caution.

1.5 Vulnerability to threat

Poaching activity in peninsular UKNP has been greatly reduced due to ongoing management by the RPUs. Within peninsula UKNP, possibly the greatest threat lies in the gradual reduction of food-plant resources due to forest closure and invasion of Langkap (*Arenga obtusifolia*). In Gunung Honje, increased threats arise from increasing human activity through high population pressure (including potential for rhino poaching), the fact that many people do not own land and that there is some negative reaction to the possibility of a Javan rhino reserve being established. Well-used human paths that were found on the study sites give a clear sign of trespassers using the area for subsistence. This level of threat will increase should land ownership become more extensive and land management more intensive through plantation and sedentary agriculture, as has been the case in the other areas under consideration. Aside from these major threats, other issues concern disease, especially anthrax, and comparatively low risk to tectonic events (e.g., tsunamis, earthquakes).

1.6 Potential interaction with government and non-government stakeholders and local communities

A survey of areas surrounding Gunung Honje and Gunung Halimun was conducted using a comprehensive set of 54 socioeconomic parameters designed to record positive and negative responses to rhino translocation and management. Gunung Honje recorded 38 (70%) positive responses compared to 18 (30%) for Gunung Halimun. The essentially negative response in Gunung Halimun (Ciusul) is largely due to the fact that there is no established history of rhino occupation in the area and the historical and economic background is not conducive to sustainable management of a Javan rhino population. Local government consideration to Javan rhino conservation is largely influenced by the extent to which there will be a direct financial benefit to local people.

1.7 Conclusions

Javan rhino habitat preference is governed by a wide variety of biophysical site factors including sensitivity to human activity. While vegetation and elevation are clearly important determinants of rhino habitat, their influence is strongly modified by proximity to water, to mineral salt, and especially to site conditions that favor the maintenance of long-term wallows. In times of drought, water scarcity can become problematic, as indicated in the history of UKNP, and may severely restrict rhino movement. Historical patterns of both natural and human disturbance in Ujung Kulon have generated a mosaic of successional stages of vegetation regeneration in which the early to mid-pioneer stages were valuable sources of food-plants and where patches of mature forest provided cover. Examination of vegetation cover on ground and via remote-sensing suggests that these mosaics are becoming increasingly homogeneous as succession moves toward closed forest. As a result, food-plant availability may be decreasing, especially where closed forest is being invaded by *Arenga*. In Gunung Halimun, Masigit Kareumbi and Leuweung Sancang, where human activity has greatly restricted access to favorable habitat, such resources are extremely minimal. Taking into account the various biophysical elements, including the influence of human activity, we can conclude that while conditions in peninsular UKNP and adjacent Gunung Honje may not be entirely optimal for sustained management of the Javan rhino, they are considerably better than those offered in GHNP or the other two areas, where translocation would almost certainly lead to failure.

1.8 Recommendations

The following recommendations are indicated:

1. Establish a Javan rhino research and conservation area inside the Gunung Honje area to focus on the localities covering Legon Pakis, Cihujan, Cikarang, Cikalejetan, Ranca Gebang and Aermokla to Cimahi.
2. Support establishing a Javan rhino research and conservation area through intensification of active management such as:
    a. Reforestation (replanting natural forest vegetation with rhino foodplants) around Legon Pakis and Cihujan.
    b. Implementing controlled slash and burn patch management in designated and closed forest areas with careful consideration in order to promote regeneration of rhino foodplants.
    c. Increased patrol and government-initiated protection measures to ensure against poaching in both UKNP and Gunung Honje.
    d. Establish new patrol paths and additional guard posts for both RPUs and NP staff in Gunung Honje.
3. Reduce infestation by Langkap (*Arenga)* palm through a well-planned operation using environmentally friendly herbicides (e.g., glyphosphate) as applied elsewhere in national parks in other countries such as Australia.
4. Increase education programs in areas adjacent to Gunung Honje to explain the benefits of rhino conservation, thereby facilitating the groundwork for a establishing second rhino habitat.

5. Conduct a detailed consultative study to explore the likely benefits of rhino-tourism.
6. Use the study outlined in this report as a framework for a more comprehensive study of the socioeconomic issues surrounding the establishment of a rhino sanctuary and related infrastructure in Gunung Honje.
7. Explore alternative approaches to land management as a means of improving livelihoods linked to active rhino management (e.g., wildlife tourism, cottage industries, agriculture intensification outside the designated conservation area).
8. Include financial and other incentives for villagers who support conservation efforts.
9. Identify families living inside the park boundary whose circumstances can be reconciled either by relocation and compensation, or by re-aligning the park boundary. Arbitration should be carried out on a case-by-case basis.
10. Establish a conservation extension and interpretative center in the Gunung Honje area.
11. Promote national and international awareness of the rhino conservation program and consider additional avenues for conservation support to include local and national governments.
12. Re-examine existing policy incentives and legal instruments surrounding rhino conservation with a view to improving conservation management.
13. Ensure funding mobilization from related government institutions, rhino conservation NGOs, and other related rhino conservation stakeholders in order to support the development of a second Javan rhino habitat.

2. INTRODUCTION

2.1 Background

The Critically Endangered[2] Javan rhinoceros (*Rhinoceros sondaicus*) is one of the most threatened of all land mammals and the rarest of the five rhino species. It survives in two small populations: 35-50 in a reproducing population in West Java's Ujung Kulon National Park (UKNP), and fewer than six animals in a non-reproducing population in Cat Tien National Park in Vietnam.

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Much of the available literature that deals with Javan rhino habitat, although relevant for its time (Hoogerwerf 1970; Schenkel and Schenkel-Hulliger (nd), 1969; Schenkel *et al.* 1978; Amman 1985; Hommel 1987, 1989; Haryono 1996), is largely outdated due to recent and continuing changes in human demography and habitat conditions. Sectionov (2009) has produced a valuable comparative overview of the prevailing conditions in UKNP including Gunung Honje, and other potential relocation sites in Java (GHNP, Leuweung Sancang, Masigit Kareumbi). For an assessment of habitat

[2] www.iucnredlist.org

suitability in Gunung Honje, the most recent and most comprehensive treatment is that of van Merm (2008), which includes a comprehensive literature review and an extensive investigation of socioeconomic factors that have the potential to influence the sustainable management of the rhino. However, the study did not include an ecological survey of Gunung Honje and related environments in UKNP and this, together with rapidly changing socioeconomic factors led van Merm (2008, p. 88) to conclude that "*A new elaborate study of the suitability of the Honje Mountains as Javan rhino habitat is necessary.*" The present study is intended to complement the findings by van Merm in a way that can help formulate urgent policy implementation in line with the Strategy and Action Plan outlined above. It is also intended to serve as a science-based framework for more intensive investigation of both socioeconomic and biophysical factors concerned with improved rhino management.

2.2 The name

The scientific name for the Javan rhinoceros or lesser one-horned rhinoceros is *Rhinoceros sondaicus* Desm. There are three distinct subspecies, of which only two are presumed to be extant.

The Indonesian Javan rhinoceros (*Rhinoceros sondaicus sondaicus*) is the most common of all Javan rhino subspecies. Once widespread throughout Java and Sumatra, it is now confined almost entirely to the small peninsula of Ujung Kulon on Western Java. Only 50 or 60 remain. The related Vietnamese Javan rhinoceros (*Rhinoceros sondaicus annamiticus*) is now reduced to no more than five individuals (sex unknown) contained in Cat Tien National Park within an area of about 4000 ha of severely degraded habitat (van Strien 1998; Khairani 2009). The Indian Javan rhinoceros (*Rhinoceros sondaicus inermis*) is believed to have become extinct early in the 20th Century.

2.3 Distribution and habitat

While the current distribution of Javan rhino is restricted to UKNP, available records suggest it is unlikely to have bred in any other locality in Java in recent times (*cf.* Sadjudin 1991) and despite anecdotal accounts of its occurrence in GHNP (Sectionov 2009). Unlike other rhino species that range across a variety of vegetation types from open savanna and swamps to closed forest, the Javan rhino is far more cryptic, preferring instead, dense lowland forest, adjacent tall grass and reed beds and areas of secondary forest succession or

Figure 1. Wallow in bamboo thicket, UKNP.

'*Belukar*'. It has a marked preference for areas such as floodplains that contain complex networks of watercourses and soil types that facilitate the establishment of wallows. Although this pattern of behavior is consistent with an assumed historical preference for low-lying areas, the Vietnamese subspecies ranges to about 2,000m – although this may be due to human population pressure (Khairani 2009).

2.4 Dependence on wallows

Wallowing in mud serves a variety of functions. It assists with thermoregulation and helps maintain skin condition as well as protecting against ectoparasites. A protective envelope is maintained by a post-wallowing layer of drying clay. Access to wallows is therefore a critical element of the Javan rhino habitat. According to Amman (1985) (quoted by Khairani 2009), four primary factors determine the location of wallows: a) *Topography:* mainly on plains rather than in hilly areas; b) *Type of vegetation*: a strong preference shown for *Arenga* forest, however no wallows were ever found in bamboo; c) *Shade:* influences the temperature of water and mud in the wallow and; d) *Concealability*: most wallows occur in well hidden, dense areas of vegetation accessed through vegetation 'tunnels'.

2.5 Feeding behavior and food resources

The Javan rhino is a browsing herbivore. It eats shoots, twigs, young foliage and fallen fruit (Novak 1999). Although the Javan rhino rarely eats grasses (hence its compatibility in feeding niche with banteng) it consumes a wide range of plant species and plant types. According to Sadjudin (1984), 166 species from 127 genera and 61 families have been recorded. Apart from a prehensile lip, the Javan rhino is capable of pushing over tall saplings (Figure 2) to access foliage and twigs. According to Schenkel and Schenkel-Hulliger (1969), "*In normal years the needs of the rhino such as cover, wallows, and bathing places are provided amply in Ujung Kulon. Only as to food plants the habitat does not appear optimal. The saplings of the plant species on which the rhino feeds are widely scattered and not frequent. Nowhere in the reserve larger stands of food plants are found. In this respect the nomadism of the rhino is essential. A low population density when not in balance with the food supply aggravates the situation of the rhino in these ways:*

Figure 2. Sapling pushed by feeding rhino UKNP.

- *Saplings of food plants are not chopped or broken in time to grow new shoots within reach of the rhino.*
- *If growing without having been chopped they soon become inaccessible for the rhino.*

- *The track system which would facilitate movement if well maintained loses its favorable qualities.*
- *Communication within the rhino population suffers directly with the low population density and indirectly with the deterioration of the path system…."*

Figure 3. Preferred food-plant assemblage for Javan rhino.

Saltlicks, so important to the Sumatran rhino, are unknown in UKNP (Khairani 2009). However, the Javan rhino has been observed visiting the seashore, where the need for salt may be satisfied (Schenkel and Schenkel-Hulliger 1969). According to Amman (1985), littoral zone plants contain higher levels of salt than plants further inland and this may also serve as a source of mineral salt for the rhino.

Figure 3 shows typical mix of regenerating secondary forest species especially *Amomum melanocheilos* in a typical forest mosaic in UKNP and Gunung Honje lowlands. Other species include *Barringtonia macrocarpa, Merremia peltata, Macaranga tanarius* and *Ficus* spp.

2.6 Vulnerability to threats

Poaching: Although poaching has declined significantly since 1967 with improvements in protection measures, it remains a serious threat to the species.

Competition: While banteng and Javan rhino occupy compatible niches, there are overlapping demands for certain food-plant species. Spatial compatibility is also a concern where increasing numbers of banteng and feral pigs may further restrict Javan rhino habitat.

Disease: In 1981-82 five rhinos died in UKNP from an unknown disease. While Anthrax is suspected, this has not been confirmed. Vulnerability to parasitic and bacterial infections transmitted by domestic ungulates from nearby villages is also of concern.

Inbreeding depression: The small size of the Javan rhino population in UKNP renders it vulnerable to a loss of genetic diversity through inbreeding. Maintenance of gene diversity is essential to confer resilience to disease carrying parasites, changes in food-plant resources, climate and inter-specific competition (Ramono *et al.* 1991).

Human pressure: Increased human settlement and farming activities in the eastern section of UKNP and adjacent Gunung Honje present real threats from habitat encroachment.

Access to water: Current access appears to be adequate. Although historical records (Schenkel and Schenkel-Hulliger 1969) indicate the Javan rhino has been subject to severe drought where water supply became critical. Should similar droughts occur in the future, we can only speculate about the resilience of the present herd to cope with such events.

Natural disasters: UKNP is situated in a dynamic tectonic zone that renders it vulnerable to earthquakes and tsunamis. The last eruption of Krakatau and the ensuing devastation of the UK peninsula have had a lasting effect on the Javan rhino habitat. More recent trends in climate change suggest we may expect greater variation in seasonal rainfall. These are factors to be considered in habitat planning and management.

3. TEAM STRUCTURE

Three separate teams were employed in the survey of peninsula UKNP, Gunung Honje and Gunung Halimun. To maintain uniformity of habitat preference assessment, members of the RPU were included in all three surveys. Team membership is listed in Tables 1 a, b, c. below.

Table 1a. Ujung Kulon peninsula survey members

No.	Name	Institution	Task/Expertise
1	Otong Sontani	YABI - RPU	Survey logistics, rhino preference score estimation
2	Bibhab Kumar Talukdar	IRF and IUCN AsRSG	Wildlife Management and Policy
3	M. Waladi Isnan	YABI - RPU	Operational
4	Sectionov	IRF	Habitat desk study, plant identification
5	Andy Gillison	CBM	Plant ecologist, assistant coordinator
6	Adhi Rachmat Haryadi	WWF	Operational and Health Assessment
7	Aphuy Syamsudin	YABI - RPU	Plant identifier
8	Yadi Suryadi	YABI - RPU	GPS navigator
9	Sorhim	YABI - RPU	Plant identifier
10	Jajat Sudrajat	YABI - RPU	Rhino preference score estimation
11	Iin Ruslani	YABI - RPU	
12	Odah	YABI - RPU	
13	Oman	Villager	Helper
14	Suardi	Villager	Helper

Figure 4. Team 1, Peninsular Ujung Kulon.

Table 1b. Gunung Honje survey members

No.	Name	Institution	Task/Expertise
1	Widodo Ramono	YABI	Wildlife Management and Policy
2	Bibhab Kumar Talukdar	IRF and IUCN	Wildlife Management and Policy
3	M. Waladi Isnan	YABI	Operational
4	Andy Gillison	CBM	Plant Ecologist and asst. coordinator
5	Adhi Rachmat Haryadi	WWF	Operational and Health
6	Haerudin R. Sadjudin	Expert	Wildlife Ecology
7	Pairah	Ujung Kulon National Park	Browsing mammal's impact
8	Eru N. Dahlan	Lore Lindu National Park	GIS
9	Hendra Gunawan	Centre of Research and Development of Forest and Natural Conservation	Socio- Economic

No.	Name	Institution	Task/Expertise
10	Tisno	YABI – RPU (Head, Unit 1 UKNP)	Rhino preference score estimation
11	Sorhim	YABI - RPU	Tree identification
12	Mulyani	YABI - RPU	Navigator
13	Yadi Suryana	YABI - RPU	Transect maker and determine position
14	Haerudin	YABI - RPU	Tree identification
15	Aphuy M. Syamsudin	YABI - RPU	Plant identification
16	Nana	Cikawung Village	Porter
17	Utom	Cikawung Village	Porter
18	Herman	Cikawung Village	Porter
19	Narsa	Cikawung Village	Porter
20	Wirya	Cikawung Village	Porter
21	Cecep Supriyadi	Cikawung Sempur Village	Porter

Figure 5. Team 2, Gunung Honje.

Table 1c. Gunung Halimun survey members

No.	Name	Institution	Task/Expertise
1	M. Waladi Isnan	YABI - RPUs	Operational
2	Adhi Rachmat Haryadi	WWF	Operational and health assessment
3	Haerudin R. Sadjudin	Expert	Wildlife Ecology
4	Andy Gillison	CBM	Plant ecologist, asst. coordinator
5	Pairah	UKNP	Browsing mammal's impact
6	Eru N. Dahlan	Lore Lindu National Park	GIS
7	Hendra Gunawan	Centre of Research and Development of Forest and Natural Conservation	Socio- Economic
8	Tisno	YABI – RPU (Head, Unit 1 UKNP)	Rhino preference score estimation
9	Sorhim	YABI - RPU	Tree identification
10	Yadi Suryana	YABI - RPU	GPS navigator
11	Aphuy M. Syamsudin	RPU	Check the scientific name of the plant
12	Anda Joni	Halimun Salak National Park	Navigator
13	Ahmad Rustiadi	Halimun Salak National Park	Navigator
14	Ridwan Setiawan	WWF	Operational and tree identification
15	Sumardi	Cikawung Village	Tree identification
16	Daryan	UKNP	Tree identification
17	Astab	Ciusul	Porter
18	Sanan	Ciusul	Porter
19	Kemid	Ciusul	Porter
20	Asrip	Ciusul	Porter
21	Ipong	Ciusul	Porter
22	Yadi Suryana	Ciusul	Porter

Figure 6. Team 3 Gunung Halimun National Park

4. METHODOLOGY

A uniform survey and sampling methodology was applied to the three study areas of UKNP, Gunung Honje and GHNP.

Methods of data and information acquisition about the living natural resource must be tailored to management purpose and scale both in the present and foreseeable future. In addition, the data acquired must be analyzable using standard, repeatable procedures, with outcomes readily interpretable to policy planners and decision makers. The present system of survey design and data collection is based on experience in many developing countries and has been successfully used in other parts of Indonesia, notably Java (GHNP), Sumatra, Kalimantan and Sulawesi covering a wide range of landscapes, vegetation types and farming systems (Gillison 2002).

Designing and implementing biodiversity baseline studies can be extremely costly and time-demanding if applied using standard statistical approaches and purely species-based inventory. Rapid appraisal methods using low-cost, high-return, gradient-directed transects or gradsects have been shown to be far more cost-effective

(Gillison and Brewer 1985; Wessels *et al.* 1998; USGS-NPS 2003). Gradsects are now widely used in surveys where there is a need for rapid appraisal of the distribution of existing biota. They are the preferred option for the National Vegetation Classification of the mainland USA as implemented by the Parks Service and The Nature Conservancy. When coupled with a standard recording protocol for species, plant functional types (PFTs) (Gillison and Carpenter 1997; Gillison 2002), vegetation structure and key site physical variables, gradsects provide an extremely useful means of rapidly establishing a knowledge baseline for planning and management. The method known as the VegClass system that is fully described elsewhere[3] is user-friendly and has been used in 12 developing countries to successfully train personnel with limited field experience and for whom English is not a first language. Unlike the majority of surveys that employ non-standard approaches, data acquired from more than 1800 sites worldwide using the standard rapid survey VegClass protocol provide a ready means of data comparison and evaluation within and between countries.

Biodiversity baseline data are but one element of the resource management matrix and are too often considered as stand-alone data. The reasons for this lie in the nature of the data that are often highly qualitative or else are restricted to species lists alone. To counter this problem, the VegClass system includes rapid, quantitative measurements of plant features that reflect plant adaptation to environment as well as vegetation structure, plant species and key site physical variables. To be considered as a useful resource component, biodiversity should play an integral part in contributing to management goals in a way that facilitates decision-making and trade-offs with respect to the prevention and rehabilitation of degraded lands. Case studies using the standardized VegClass approach combined with gradsects in baseline surveys in Africa, Brazil, Indonesia and Thailand (CBM 2009) show that when combined with soil, faunal and remotely sensed data, the frequently strong statistical linkages provide a science-based approach to selecting readily observable field indicators for biodiversity and agricultural productivity.

All data collected using this system are quantitative, thereby facilitating numerical analysis and reducing dependence on subjective interpretation. The user-friendly, open-source (public domain) software includes a means of internal data analysis and provides a ready means of exporting data according to industry-standard, spreadsheet or database programs. The spatially referenced data acquired using this methodology also lend themselves readily to spatial analysis such as predictive (GIS) modeling and mapping of species, functional types or biodiversity patterns.

At each site we positioned a 200 m^2 (40 x 5m) transect according to the standard VegClass recording procedure combined with gradsects (Figure 7), where we recorded site physical details, vegetation structure, presence of all indigenous and introduced vascular plant species and plant functional types (PFTs) (Annex II).

[3] www.cbmglobe.org

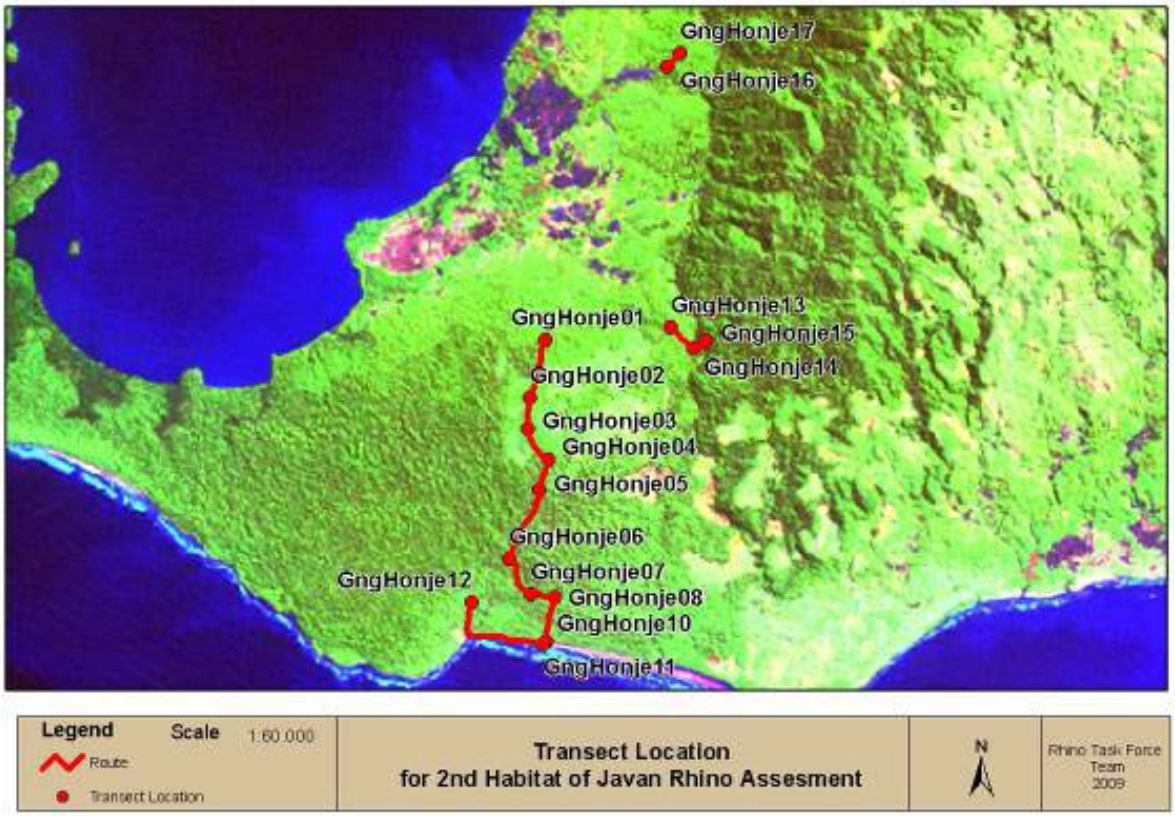
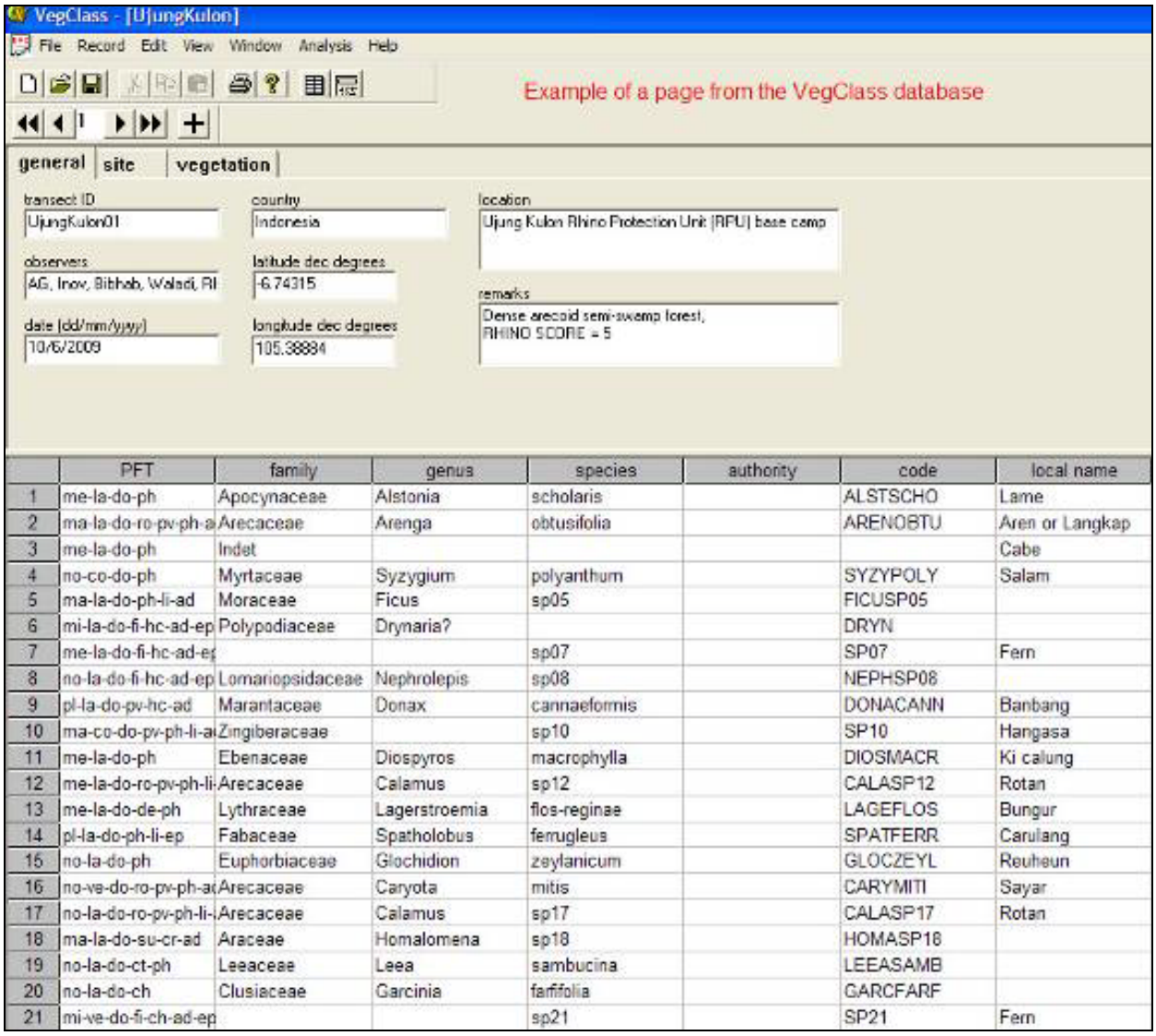


Figure 7. Survey route through Gunung Honje traversing a range of environmental gradients from shoreline to low hills.

A rule set and grammar (Gillison and Carpenter 1997) incorporated in the VegClass software were used to construct plant functional types (PFTs) from a generic set of 36 plant functional elements (PFEs) (based on the plant functional attributes of Gillison (1981). We used VegClass to generate a plant functional complexity (PFC) value as a complement to PFT richness. PFC is not a measure of functional diversity in the usual ecological sense (*cf.* Magurran 2004) but is potentially useful when comparing transects especially where PFT richness may be identical but where PFE composition varies.

Standard Pearson correlation analysis was used to explore statistical relationships between the variables recorded by VegClass and the independent rhino score assessment to see if a score for rhino habitat could be independently estimated by other, readily observable biophysical attributes. Only correlates with $P < 0.05$ were considered for potential indicator value. Under conditions where single attribute correlations may carry limited information, improvements in predictive value can be explored through multidimensional scaling (MDS) of defined attribute sets. In our case we used MDS via the PATN multivariate software package (Belbin 2008) with a Bray-Curtis similarity measure and a semi-strong hybrid scaling (SSH) procedure (Belbin 1991, 1993, 2008).



	PFT	family	genus	species	authority	code	local name
1	me-la-do-ph	Apocynaceae	Alstonia	scholaris		ALSTSCHO	Lame
2	ma-la-do-ro-pv-ph-a	Arecaceae	Arenga	obtusifolia		ARENOBTU	Aren or Langkap
3	me-la-do-ph	Indet					Cabe
4	no-co-do-ph	Myrtaceae	Syzygium	polyanthum		SYZYPOLY	Salam
5	ma-la-do-ph-li-ad	Moraceae	Ficus	sp05		FICUSP05	
6	mi-la-do-fi-hc-ad-ep	Polypodiaceae	Drynaria?			DRYN	
7	me-la-do-fi-hc-ad-e			sp07		SP07	Fern
8	no-la-do-fi-hc-ad-ep	Lomariopsidaceae	Nephrolepis	sp08		NEPHSP08	
9	pl-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis		DONACANN	Banbang
10	ma-co-do-pv-ph-li-a	Zingiberaceae		sp10		SP10	Hangasa
11	me-la-do-ph	Ebenaceae	Diospyros	macrophylla		DIOSMACR	Ki calung
12	me-la-do-ro-pv-ph-li	Arecaceae	Calamus	sp12		CALASP12	Rotan
13	me-la-do-de-ph	Lythraceae	Lagerstroemia	flos-reginae		LAGEFLOS	Bungur
14	pl-la-do-ph-li-ep	Fabaceae	Spatholobus	ferrugleus		SPATFERR	Carulang
15	no-la-do-ph	Euphorbiaceae	Glochidion	zeylanicum		GLOCZEYL	Reuheun
16	no-ve-do-ro-pv-ph-a	Arecaceae	Caryota	mitis		CARYMITI	Sayar
17	no-la-do-ro-pv-ph-li-	Arecaceae	Calamus	sp17		CALASP17	Rotan
18	ma-la-do-su-cr-ad	Araceae	Homalomena	sp18		HOMASP18	
19	no-la-do-ct-ph	Leeaceae	Leea	sambucina		LEEASAMB	
20	no-la-do-ch	Clusiaceae	Garcinia	farfifolia		GARCFARF	
21	mi-ve-do-fi-ch-ad-ep			sp21		SP21	Fern

Figure 8. Example of a page of field records from the VegClass proforma.

In many ecological studies, two or three-dimensional ordinations are commonly run to visualize the distribution sites on significant environmental gradients. Because single axis solutions are better suited to correlative analyses than multiple axes, we extracted these values for each set of plant, soil and remotely sensed variables. Each set of axis scores for plant, soil and remote sensing was then regressed against the other in turn. We applied SSH to a sub-set of five plant-based variables (species and PFT richness, species:PFT richness ratio, mean canopy height, basal area) known from similar studies in other tropical countries to correlate well with soil properties and faunal species richness (Gillison 2002; Gillison *et al.* 2003).

5. AREAS 1 AND 2 - PENINSULAR UJUNG KULON NATIONAL PARK AND GUNUNG HONJE

5.1 Geographic location

Ujung Kulon National Park (6° 45'S, 105° 20'E) and Krakatau Nature Reserve (6° 06'S, 105° 25'E) make up a World Heritage Site. UKNP lies on the extreme south-western tip of Java within the administrative province of Java Barat (West Java) and the Kabupaten of Pandeglang. The point-to-point ocean boundary encloses Ujung Kulon Peninsula and the offshore islands of Pulau Handeuleum and Pulau Peucang, whilst the island of Pulau Panaitan is separated by the 10-km-wide Panaitan Straits. The eastern boundary follows contours along the eastern foothills of the Gunung Honje massif. UKNP is located in the south-westernmost corner of the island of Java, Indonesia. It covers an area of about 300 km^2, including the entire Ujung Kulon peninsula, the islands of Peucang, Handeuleum and Panaitan and part of the mainland, including Mount Honje, of which the eastern slopes define the border of the Park (Figure 9). Ujung Kulon National Park 120,551hectares (ha) (terrestrial: 76,214 ha; marine: 44,337 ha) and ranges from sea level to 620 meters (m) at the summit of Gunung Honje.

5.2 Physical features

Ujung Kulon is a triangular peninsula protruding from the southwest extremity of mainland Java, to which it is joined by a low isthmus some 1-2 km wide. The topography is dominated in the southwest by the three north-south aligned ridges of the Gunung Payung massif, with the peaks of Gunung Payung, Gunung Guhabendang and Gunung Cikuja forming the highest points on the peninsula. To the northeast, the relief attenuates to the low rolling hills and plains of the Telanca Plateau, and ultimately to the low-lying swamps in the region of the isthmus. To the east the Gunung Honje massif forms the mainland component of the park. Coastal formations include a number of raised coral islands and their associated fringing reefs which lie off the northern coast of the peninsula, the largest of these being Pulau Handeuleum. To the south, the coastline is characterized by sand dune formations, areas of raised coral reef, and further west a long stretch of undermined and shattered sandstone slabs. Extensive coral reefs and spectacular volcanic formations occur along the exposed and broken west coast.

Geologically, Ujung Kulon, Gunung Honje and Pulau Panaitan are part of a young Tertiary mountain system, which overlies the pre-Tertiary strata of the Sunda Shelf. Both Ujung Kulon and Gunung Honje are thought to have formed the southernmost extension of the Bukit Barisan mountains during the Pleistocene, having become separated from Sumatra following the collapse of the arched Sunda straits dome.

Central and eastern Ujung Kulon comprise raised Miocene limestone formations, which have become overlain in the north by alluvial deposits and in the south by sandstones. To the west, the Gunung Payung massif is of Miocene sedimentary

origin, while the Gunung Honje massif to the east is an eastward tilted mountain block, its western edge being broken by a fault line running parallel to the coast. To the north of the peninsula, Pulau Panaitan displays a similar pattern of deposition and uplift as the Gunung Payung massif, although volcanic material and breccias form outcrops in the northwest. Soils have undergone extensive local modification following deposition of volcanic ash during the 1883 Krakatau eruption. The central plateau is typified by grumusols, regosols and mediterrans, while the Gunung Payung and Honje massifs are overlain with yellowish-red and brown latosols. To the northwest and east along the peninsula and narrow isthmus coast, alluvial hydromorphs dominate.

Figure 9. Map showing the borders of Ujung Kulon National Park including adjacent Gunung Honje. *Source:* www.panda.org

water catchments. Telanca Plateau drains southward via the Citadahan, Cibandawoh and Cikeusik Drainage is from three distinct rivers, and northeast and eastward via the Cikarang and Cigenter rivers while the southwestern massif drains radially via numerous perennial streams. Gunung Honje drains westward to Welcome Bay and southwards to the Indian Ocean.

By comparison, Gunung Honje is much more deeply dissected, with steep slopes averaging between 300- 600. There are several peaks in the Gunung Honje the tallest being Gunung Honje II at 620 meters above sea level. Others are Gunung Honje I

(608 m), Gunung Tilu (465 m), Gunung Patujah (400 m), Gunung Batu (314 m), and Gunung Cimahi (183 m).

5.3 Climate

Conditions are tropical maritime, with a seasonal mean annual rainfall of approximately 3250 millimeters (mm). Heaviest rainfall is between October and April during the northwest monsoon, and a noticeably drier period occurs between May and September during the southeast monsoon. Mean monthly rainfall figures of 400 mm have been recorded for December and January, and 100 mm per month during May to September. Mean temperatures range between 25°C and 30°C and relative humidity between 65% and 100%. Fauzi and Stoops (2004) describe the climate in the northern part of the Gunung Honje as isohyperthermic, with a mean annual temperature of 26.8°C and an average annual rainfall of 3388 mm, with peak of 549 mm in December. July is the driest month with only 108 mm of rainfall on average.

Ujung Kulon National Park received World Heritage Site status from the World Heritage Commission of UNESCO under decree No: SC/Eco/5867.2.409, after considering the uniqueness of this conservation area as the habitat of the last remaining population of the Javan rhino and the possibility that it is the world's most endangered large mammal species.

5.4 Results of data analysis

Site locations and their key physical features are listed in Table 2 (see also Figure 14 for peninsular UKNP and Gn. Honje).

Table 2. Site locations, Ujung Kulon NP, Gunung Honje, Halimun – Salak NP

Transect	Location	Lat. S	Long. E	Elevn (m)	Slope%	Aspect°
UKNP01	Ujung Kulon NP	-6.74315	105.38884	3	3	360
UKNP02	Ujung Kulon NP	-6.74818	105.38330	70	5	250
UKNP03	Ujung Kulon NP	-6.74969	105.37697	13	40	190
UKNP04	Ujung Kulon NP	-6.45175	105.23043	21	10	20
UKNP05	Ujung Kulon NP	-6.45293	105.23360	30	0	0
UKNP06	Ujung Kulon NP	-6.45270	105.23528	15	0	0
UKNP07	Ujung Kulon NP	-6.45046	105.23572	5	0	0
GHON01	Geundir	-6.82190	105.50580	21	0	0
GHON02	Cikanyere	-6.82960	105.50383	28	5	290
GHON03	Kalecetan	-6.83369	105.50352	45	0	0
GHON04	Hulu Cikalejetan	-6.83791	105.50629	50	0	0
GHON05	Hulu Cikalejetan	-6.84179	105.50508	46	0	0
GHON06	Cikalejetan selatan	-6.85099	105.50107	70	0	0
GHON07	Cikalejetan - Air Moklah	-6.85567	105.50391	71	0	0
GHON08	Kubangen Cikarang	-6.85607	105.50704	67	0	0
GHON09	Ranta sebang.	-6.85896	105.50599	64	0	0
GHON10	Airmoklah - Kalejetan	-6.86198	105.50597	6	0	0
GHON11	Pantai Kalejetan	-6.86223	105.50558	7	40	200
GHON12	West of Kalejetan river	-6.85683	105.49607	13	0	0
GHON13	Cimahi bukit	-6.82033	105.52248	62	12	210

Vascular plant species and PFT richnesss (diversity) toether with an estimate of plant functional complexity (PFC) are summarised in Table 3 with vegetation structural variables listed in Table 4.

Table 3. Summary of species, PFTs and PFC

Transect	Species	PFTs	Spp:PFT	PFC
UKNP01	23	21	1.10	170
UKNP02	15	14	1.07	112
UKNP03	25	21	1.19	144
UKNP04	21	18	1.17	138
UKNP05	21	17	1.24	134
UKNP06	20	17	1.18	142
UKNP07	18	17	1.06	90
GHON01	35	27	1.30	158
GHON02	34	22	1.55	138
GHON03	22	18	1.22	128
GHON04	52	33	1.58	174
GHON05	41	22	1.86	124
GHON06	10	7	1.43	42
GHON07	34	27	1.26	148
GHON08	55	39	1.41	230
GHON09	24	16	1.50	102
GHON10	31	25	1.24	142
GHON11	17	16	1.06	144
GHON12	33	22	1.50	136
GHON13	51	29	1.76	176
GHON14	48	28	1.71	174
GHON15	55	33	1.67	190
GHON16	47	27	1.74	176
GHON17	53	40	1.33	240
GHALNP01	50	39	1.28	208
GHALNP02	66	54	1.22	352
GHALNP03	51	47	1.09	264
GHALNP04	66	46	1.43	294
GHALNP05	64	46	1.39	266
GHALNP06	51	40	1.27	216
GHALNP07	49	36	1.36	246
GHALNP08	57	34	1.68	200

Table 4. Vegetation structural features *

Transect	Ht	CCTot	CCWdy	CCNwdy	Bryo	WPlts	Litt	BA	MFI	FICV
UKNP01	30	98	95	3	4	8	4	20.67	25.00	116.26
UKNP02	10	98	90	8	5	6	4	9.33	16.00	174.91
UKNP03	18	98	95	3	6	8	3	15.33	15.50	194.65
UKNP04	25	95	95	0	5	4	3	6.00	23.00	116.41
UKNP05	18	98	95	3	5	5	3	18.67	18.50	189.11
UKNP06	35	98	97	1	4	4	4	18.00	22.00	141.14
UKNP07	0.15	99	5	94	0	4	0.01	0.01	100.00	0.00
GHON01	28	98	97	1	0	0	4	17.33	24.75	77.13
GHON02	15	95	94	1	3	7	3	17.33	35.75	90.67
GHON03	28	95	94	1	3	8	4	17.33	41.50	73.97
GHON04	20	98	96	2	3	6	2	18.67	24.25	91.79
GHON05	38	98	97	1	6	8	3	25.33	18.00	97.65
GHON06	30	98	98	0	4	2	1	18.00	9.25	189.92
GHON07	17	90	80	10	4	7	1	17.33	16.75	140.44
GHON08	10	98	96	2	4	7	2	8.00	22.75	92.83
GHON09	35	90	89	1	3	7	2	19.33	28.75	102.17
GHON10	12	90	85	0	3	6	2	12.00	25.00	96.68
GHON11	3	95	80	15	1	3	4	1.00	99.65	1.19
GHON12	16	95	95	0	3	6	3	16.67	30.50	88.67
GHON13	18	98	96	2	4	7	3	16.00	43.50	66.41
GHON14	40	98	98	0	5	6	5	22.00	23.25	89.43
GHON15	35	98	98	0	3	5	4	30.00	27.75	82.77
GHON16	35	98	98	0	3	6	3	27.33	38.75	62.78
GHON17	18	95	90	5	3	7	4	22.67	48.00	64.00
GHALNP01	4.5	95	90	5	1	6	5	2.00	57.75	81.58
GHALNP02	22	98	96	2	8	8	12	20.67	23.25	78.71
GHALNP03	18	90	80	10	6	8	4	10.00	43.65	84.05
GHALNP04	25	95	90	5	5	8	3	15.33	25.75	102.22
GHALNP05	25	98	90	8	6	8	4	16.00	18.75	101.96
GHALNP06	35	90	85	5	6	8	8	31.33	32.55	59.97
GHALNP07	25	95	90	5	6	7	10	30.67	32.75	75.85
GHALNP08	16	70	0	70	4	5	20	33.33	46.50	77.00

* Ht = Mean canopy height (m); Cctot= Total canopy projective foliage cover percent; Ccwdy = projective foliage cover percent of woody plants; CCNwdy, PFC of non-woody plants; Bryo = cover-abundance of bryophytes; Wplts = cover-abundance of woody plants <2m tall; Litt = plant litter depth (cm); BA = basal area of all woody plants (m^2ha^{-1}); MFI = mean furcation index; FICV = coefficient of variation percent of FI. (See also Annex II for complete listing of site variables)

Plant-based predictors of rhino habitat preference: In this study, plant diversity or richness (number of species and PFTs) is negatively correlated with rhino habitat preference score as is plant litter depth. Ecological diversity measures for PFTs (Shannon H´, Simpson's and Fisher's Alpha) although statistically significant, were only weakly correlated with habitat preference. Two key vegetation structural variables, mean canopy height and basal area are not significantly correlated whereas there is a highly significant ($P < 0.0001$) quadratic relationship between rhino score and the ratio of projective foliage cover of woody to non-woody plants that is

consistent with observed habitat preference for intermediate levels of disturbance. Although statistically significant, individual plant-based variables are of only marginal value as estimators of rhino habitat preference. On the other hand, specific combinations of plant variables such as species and PFT richness, Plant Functional Complexity (PFC) and basal area, show strong non-linear correlation with rhino habitat scores (Figure 10). At the time of writing, the team was unable to explore predictive linkages between rhino score and remotely-sensed variables (Landsat, SRTM). While elevation is negatively correlated with rhino score (Figure 11), this is not reflected in other site features such as slope percent and aspect. Characteristic vegetation cover for high habitat preference can be seen in Figure 12.

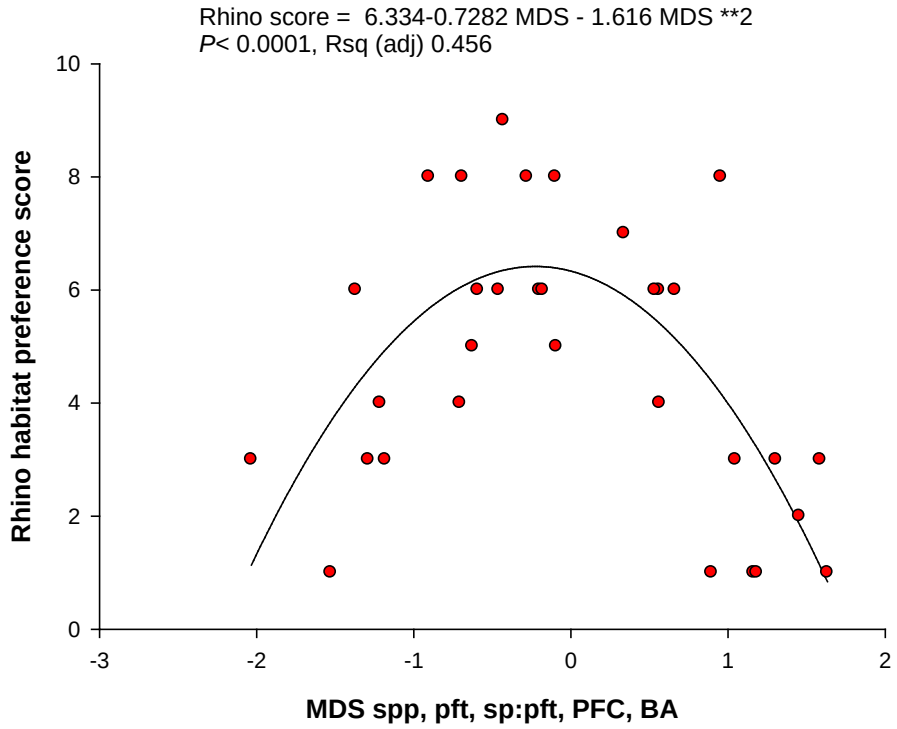


Figure 10. Rhino habitat preference score regressed against multi-dimensional scaling (MDS) of combined variables (spp, species richness; PFT, plant functional type richness; ratio spp:PFT richness; BA, basal area all woody plants m^2ha^{-1}). Points are 40x5m ($200m^2$) transects for UKNP, Gunung Honje and Gunung Halimun National Park.

Overall vegetation typology is generally consistent with accounts by Putro (1997) and Hommel (1987) as described by van Merm (2008). However, a study of recent Landsat imagery indicates vegetation succession is moving towards a more mature forest cover where the composition of food-plant species normally associated with secondary growth (e.g., Figure 3) may be expected to decline with time. Hommel (1987) quoted by van Merm (2008) notes an altitudinal depression of plant species normally associated with higher elevations. The phenomenon known as the

"Massenerhebung effect" tends to be widespread through other areas of the lowland tropics especially among islands with a lower than usual cloud layer.
Of general ecological interest is the fact that plant species and PFT diversity is surprisingly low in UKNP (~ 20 species and 17 PFTs per 200m^2) and moderately low (~ 38 species, 25 PFTs) in Gunung Honje and somewhat higher (57 species, 43 PFTs) in GHNP. By comparison, 200m^2 transects in lowland Jambi and Riau Provinces in Sumatra commonly contain more than 120 species and 80 PFTs. Presented with these facts, one may speculate that unusually low plant diversity in the areas currently occupied by Javan rhino may be a result of previous devastation caused by the eruption of Krakatau and subsequent reinvasion from shoreline gene pools. In UKNP inland lowland sites, this is supported by unusually high numbers of genera in the families Annonaceae, Ebenaceae, Lecythidaceae and Rhizophoraceaeae that are more commonly associated with littoral habitats.

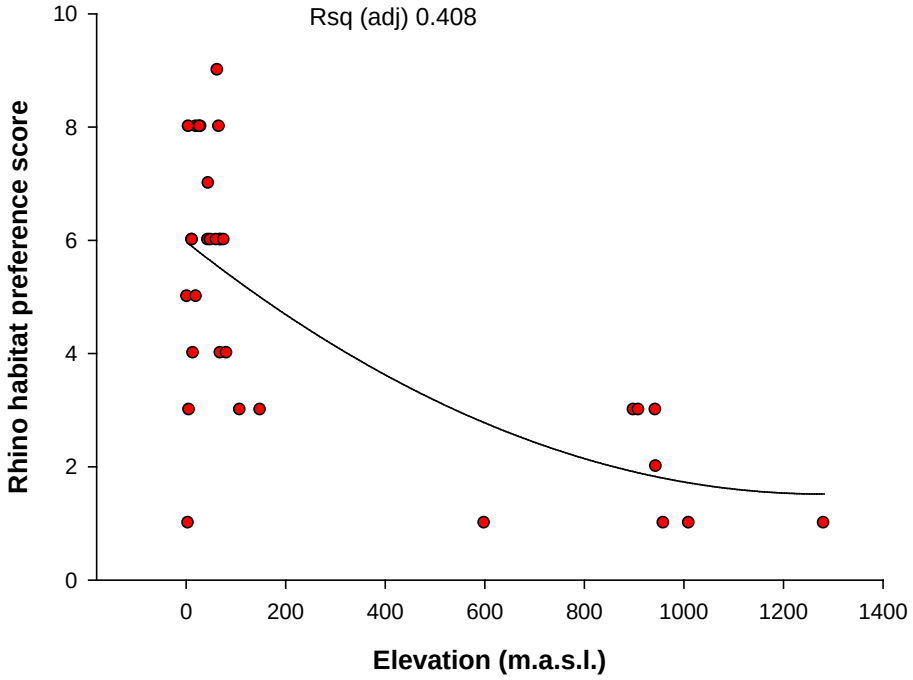


Figure 11. Rhino habitat preference score regressed against elevation.

5.5 Spatial modeling of habitat preference

Spatial analysis using key physical variables (geology, soil type, land cover, proximity to water, proximity to village) suggests there is a high percentage of areas in UKNP and Gunung Honje suitable for Javan rhinos (Figure 13). Modeling using DOMAIN potential mapping procedures (Figures 14 and 15) also highlight a significant number of areas suitable for Javan rhino management. While generally indicative, neither of these approaches includes key variables such as conditions suitable for maintaining long-term wallows or access to mineral salt sources. As such, output

from these initial models should be viewed with caution until an opportunity exists for the inclusion of a broader suite of habitat criteria.

Figure 12. UKNP Transect 4 Rhino preference score 8. Note patches of regenerating forest.

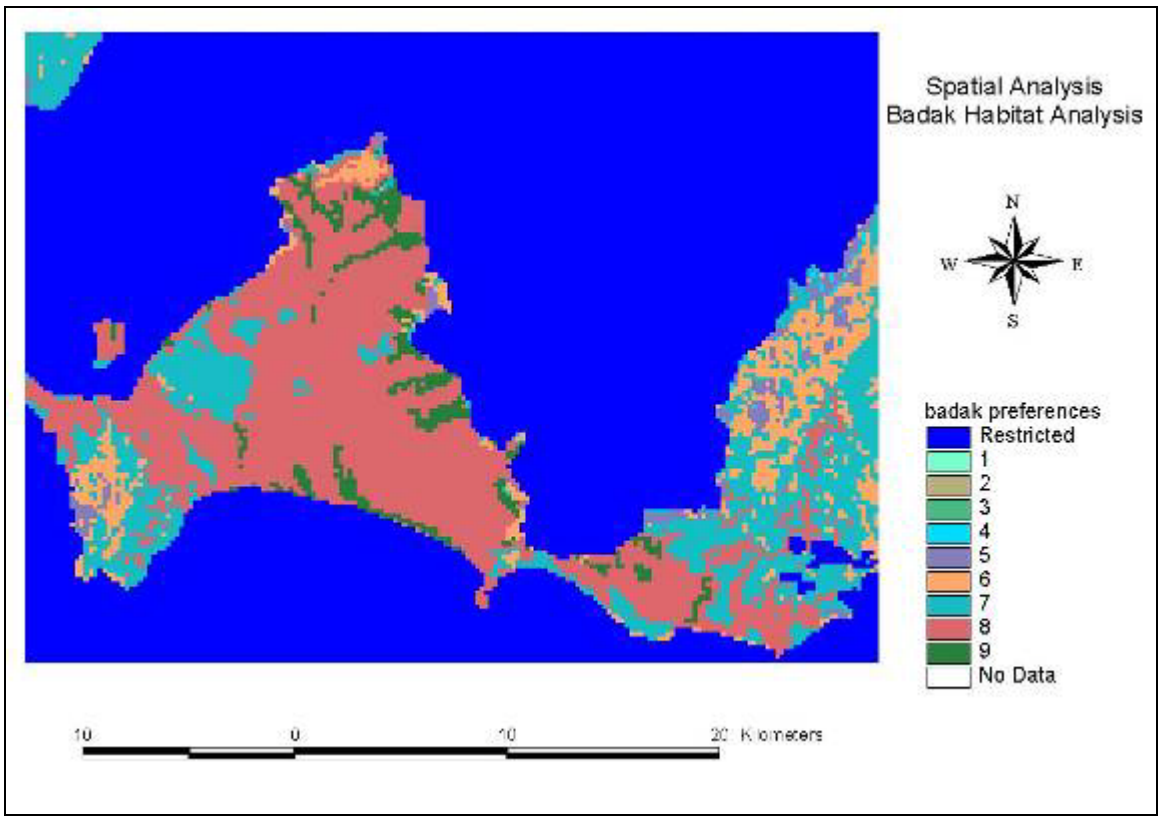


Figure 13. Spatial analysis using key physical variables (geology, soil type, land cover, proximity to water, proximity to village).

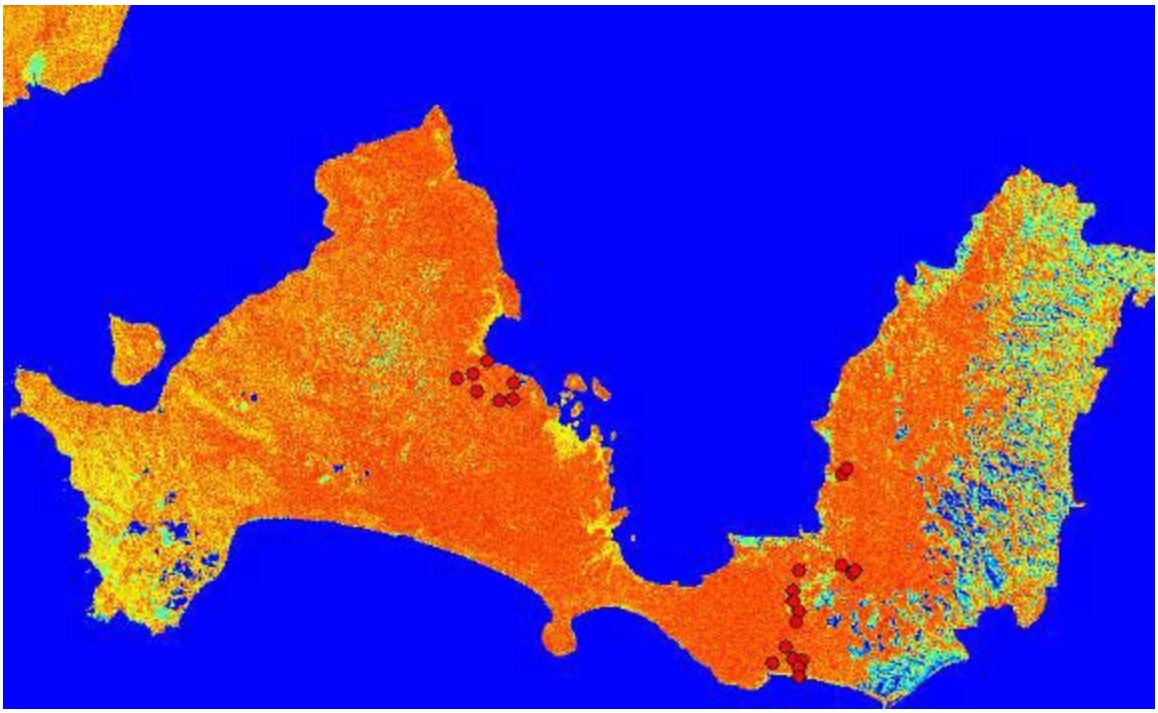


Figure 14. DOMAIN mapping of environmental representativeness of all 24 transect sites for UKNP and Gunung Honje. Red = highest similarity, grading through yellow to blue (lowest). Based on Landsat Bands 1, 2, and 3.

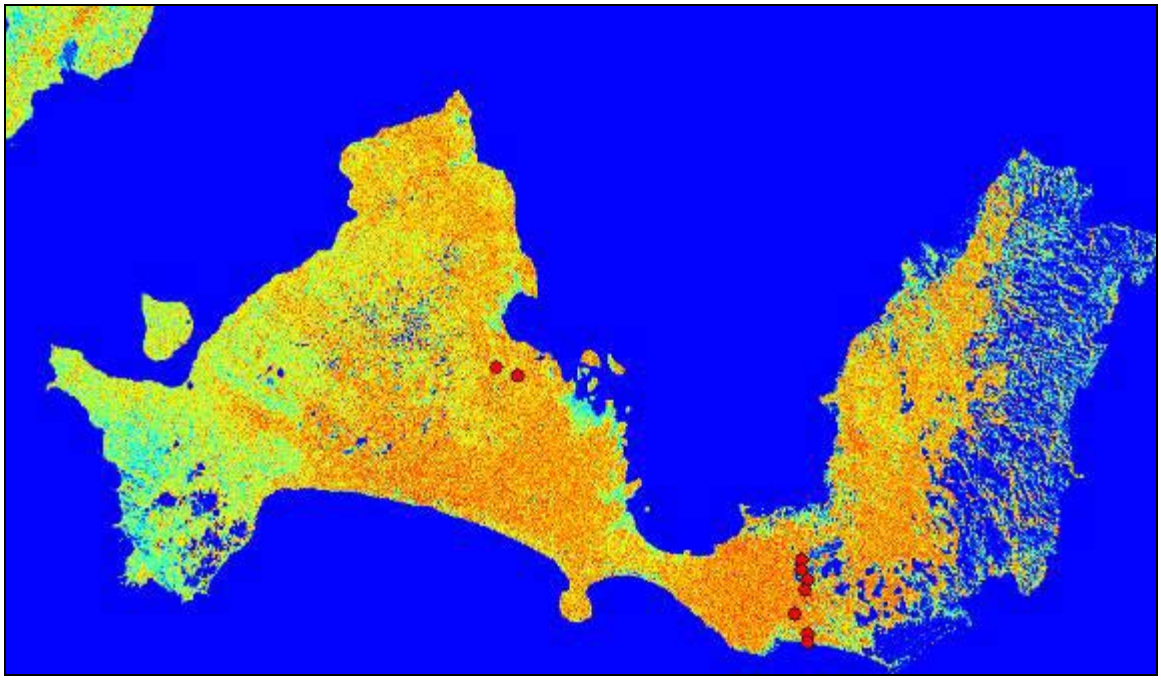


Figure 15. DOMAIN potential mapping of most preferred rhino habitat (matched against preference scores ~ 8 or higher). Red = highest similarity grading through yellow to blue (lowest match). Based on Landsat Bands 1, 2, 3.

5.6 Vulnerability to threat

Poaching activity in peninsular UKNP has been greatly reduced due to ongoing management by the RPUs. Within peninsular UKNP, possibly the greatest threat lies in the gradual reduction of food-plant resources due to forest closure and invasion of Langkap (*Arenga obtusifolia*). In Gunung Honje, increased threats arise from increasing human activity through high population pressure (including potential for rhino poaching), the fact that many people do not own land and that there is some negative reaction to the possibility of a Javan rhino reserve being established. A number of well-trodden human paths were intercepted during the survey. This level of threat will increase should land ownership become more extensive and land management more intensive through plantation and sedentary agriculture as has been the case in the other areas under consideration. Aside from these major threats, other issues concern disease, especially Anthrax, and comparatively low risk to tectonic events (e.g., tsunamis, earthquakes).

Apart from the threat levels identified in the introduction, threats in Gunung Honje are significantly higher due mainly to the relative increase in human activity through agricultural and forestry activities and greater potential for poaching.

5.7 Potential interaction with government and non-government stakeholders and local communities

Building on results from a previous survey (van Merm 2008) and with respect to the assessment criteria (Table 4), a survey of areas surrounding Gunung Honje and Gunung Halimun was conducted using a comprehensive set of 54 socioeconomic parameters designed to record positive and negative responses to rhino translocation and management. Gunung Honje recorded 38 (70%) positive responses compared to 18 (30%) for Gunung Halimun. The overall negative response in Gunung Halimun (Ciusul) is largely due to the fact that there is no recorded history of rhino occupation in the area and the socioeconomic conditions are not conducive to sustainable management of a Javan rhino population. Table 5 below outlines in detail the socioeconomic assessment (compiled by H. Gunawan).

Table 5. Criteria for the second habitat assessment of Javan rhino[4]

1. Areas that are within historic home range of the Javan rhinoceros
2. Appropriate and suitable habitat
3. Year-round water availability
4. Protected area to support habitat and species protection
5. Areas large enough to sustain the new population
6. Indications of previous rhino inhabitation
7. Ease of transport for translocating the rhinos
8. Degree of separation between original and second habitats
9. Management capacity in the second habitat
10. Potential external support for this area
11. Commitment from local government in this area
12. Potential of eco-tourism activities in this area
13. Potential for education and community awareness in the new habitat

Table 6. Results from field interviews

Key issues	Gunung Honje	Gunung Halimun
Human Population Growth	Between 1997 – 2007 Population 4.586 Density 193 – 462 ind /km^2 Population Growth Cimanggu: 2.59% per year Sumur: 3.10% per year	Ciusul : Population 1.841, Density 53 ind/ km^2 Growth 0.68 % per year
Livelihoods of local people who live in the villages close to or adjacent to the Park (Especially the closest villages),	Farmer: 72% Have no land 49% <u>Increasing number of farmers (1995 – 2007):</u> 4.78 – 10.78% per year	Farmer: 63% Have no land 43% No record
Land ownership	<u>Sub District Cimanggu</u>: Farmer 88.3% (Cibadak and Ranca Pinang respectively 95%), With ratio of land ownership: Cibadak 1.92 ha per family, Ranca pinang 1.67 ha per family. <u>Sub District Sumur</u>: Farmer 73 %	Ratio of land ownership 2.1 ha per family

[4] PHKA (2004) has set the criteria for selecting best place for second habitat consisting of the aspects listed in this table. This study deals specifically with criteria 10-13.

Key issues	Gunung Honje	Gunung Halimun
	(Ujung Jaya and Tamanjaya, respectively 80.48%) Ujung Jaya 0.82 ha per family Tamanjaya 0.79 ha per family Tamanjaya and Ujung Jaya are a potential threat to the Park area	
Interaction and dependency on forest	46%	50%
Forest encroacher	35% of 150 respondents	40% of 30 respondents
Non-timber forest product (firewood)	38 % of 41 % for sale;	88% for subsistence (where 7% for sale)
Potential poaching	Still potential poachers	No report
Perception of local people to the Program on establishing the 2nd habitat of Javan rhino	46% support 24% disagree	23% support 54% disagree
Expectation for ecotourism development	22%	16%
Potential for education and community awareness	Proud of rhino 82% Give high value to rhino 75% Appreciate conservation of rhino 27% Understand rhino must be conserved 51%	Proud of rhino 30% Give high value to rhino 20% Appreciate conservation of rhino 19% Understand rhino must be conserved 10%
Perception of local people to the Park Management	84% having good relation 98% having benefit	20% having good relation 37% having benefit
Support from local Government, at the Sub Districts and Village levels	Support from all level of local government (village, sub district, district, province)	Village level : support Sub district : No record

6. AREA 3 - GUNUNG HALIMUN NATIONAL PARK[5]

6.1 Location and history

Gunung Halimun (Halimun-Salak) National Park (GHNP) is a conservation area in the Indonesian province of West Java. It is located near the better-known Gunung Gede Pangrango National Park, and to the city of Bogor, home to Bogor Botanical Gardens. GHNP is 400 km^2 in area, half of which makes up what is arguably the best and most complete forest area in Java (Figure 16). GHNP is a large national park that includes the Nirmala tea estate. Since the mid 1980s, Javan hawk-eagles have been regularly observed both from the estate and along its borders. The forests of the Mount Halimun Massif are the largest tract of true rain forest now remaining on Java. The wide altitudinal range contributes to great habitat diversity. The area's particular importance for wildlife protection was acknowledged on 26 February 1992, when GHNP was established by Ministry of Forestry decree SK No. 282/Kpts-II/92. Originally, most of the Park's 40,000 ha was classified as protection forest, declared during the period 1924-1934. The area was slightly enlarged in 1979 when its status changed to nature reserve. On 26 May 1992, management and responsibility for the setting up of the new National Park was transferred to the Headquarters of Gunung Gede Pangrango National Park.

The park is located between longitudes 106°21' - 106°38' East and latitudes 6°37' - 6°51' South, within the regencies of Bogor, Sukabumi and Lebak. The gazetted area is mountainous, ranging from 500 m to 1,929 m above sea level (asl).

Many peaks lie within the Park's boundaries: Halimun 1929m, Sanggabuana 1919m, Kendeng 1867m, Botol 1785m, South Kendeng 1764m, South Halimun 1744m and Amdan 1463m. Apart from the primary function of habitat protection, the National Park plays an important role in supporting regional development and opportunities for research, education, eco-tourism and horticultural activities such as orchid growing. With the creation of GHNP, the three West Javan parks (Gunung Gede Pangrango, Gunung Halimun and Ujung Kulon), together provide a range of habitats from sea level to the highest peaks. Such conservation planning will help assure a secure future for the rich and threatened wildlife of this densely-populated province. Its mountain tops reach 1929m and are often mist-shrouded, while its valleys are thought to hide as-yet undiscovered biodiversity.

The lower zones hold apparently secure populations of the endangered West Javan gibbon (*Hylobates moloch moloch*). Mount Halimun is its most secure habitat, but its range is restricted to a thin ring around the park as the species is not found above 1200m. Javan langur (*Trachypithecus auratus*), and other endemic species are evident; about half of its 145 known bird species are rarely seen elsewhere in Java. The Park protects the water catchments for the densely populated urban and agricultural areas to the north.

[5] Extracted from Sectionov (2009)

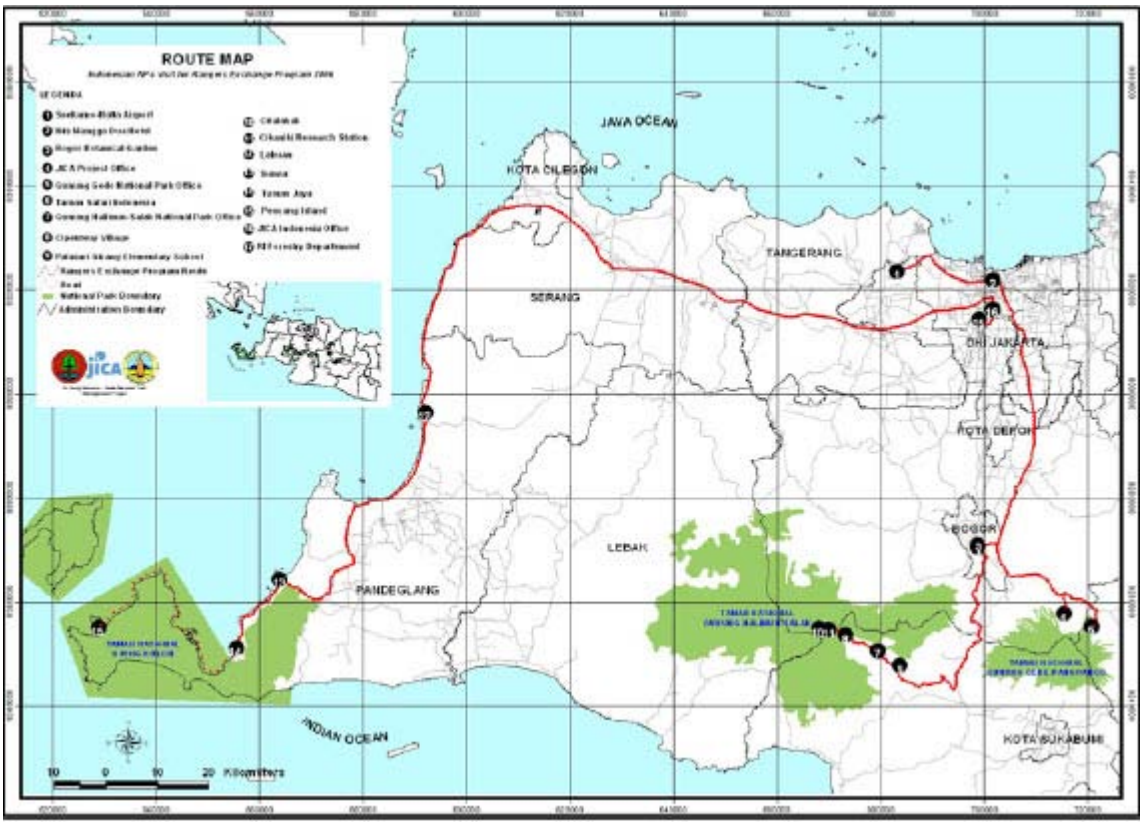


Figure 16. Location of Gunung Halimun-Salak National Park.

6.2 Climate

Typical annual rainfall varies from 4000 - 6000 mm/year, very high even for West Java. The wet season occurs from October to April, with precipitation around 400-600 mm/month. Even in the so-called "dry season", June to September, rainfall is usually in excess of 200 mm/month. During the day, warm air rises over the land and warm, saturated air from over the ocean moves in to take its place. When this humid air reaches the mountains it cools; water condenses into clouds and a deluge of rain follows (orthographic precipitation). Rainfall here is strongly influenced by seasonal changes in wind direction.

6.3 Geology

Based on geological history, Mount Halimun and neighboring peaks are sisters of South Sumatra's Barisan Mountains. During the Lower Miocene and Pliocene (10-20 million years ago) the rocks of the whole area were pushed upwards. This uplifting formed the Bayah Dome. Subsequent partial collapse of the structure resulted in the area of lowland, which now forms the Sunda Straits separating Java and Sumatra. The two islands were last linked some 10,000 years ago. Accompanying early tectonic movements, lava ridges built up along fracture lines in the earth's crust. With dome collapse, a south facing horseshoe formation of volcanoes developed. Over the years, weathering has eroded the area, giving a more rounded landscape, but these ancient

features remain. Mount Halimun's rocks largely consist of breccia and andesitic and basalt lavas. There also as few sedimentary areas. Gold and silver ores occur, and mining takes place in the west and southwest.

6.4 Hydrology

The Halimun Massif is a vital watershed, being the source of several important rivers supplying both the urban and farming communities of West Java. To the north, large rivers flow towards the densely populated regencies of Tangerang and Bogor, while to the South Sukabumi and Lebak regencies and the coast are fed by many small rivers. The park's forested ridges slowly release water helping to preventing floods in the wet season and water shortages in the dry season.

6.5 Vegetation

In contrast to the Mount Gede area, Mount Halimun has been poorly researched. There is still a strong conviction that the mountains are haunted; because of this, early researchers found it very difficult to obtain guides. The past geological link with South Sumatra is reflected in the vegetational affinity between the two areas. More than half the forest occurs in the altitudinal range 1000-1400m. This can be regarded as sub-montane forest, a type which possesses a greater diversity of plants than higher, cooler areas. Dominant tree species are the huge rasamala *(Altingia excelsa)*, the puspa *(Schima walichii)*, and oaks *(Castanopsis, Lithocarpus, Quercus)*. Smaller laurel trees *(Litsea spp.)* also make up an important constituent. Orchids and other epiphytes are numerous. Lianas, are well represented and include rattans. The high rainfall gives rise to a rich community of ferns and mosses, palms, rhododendrons, tree ferns and orchids, all of which add to the area's high botanical value. In the higher montane forest diversity is less, with dominant conifers *(Dacrycarpus imbricatus, Podocarpus blumeii and P. neriifolius)*.

Figure 17. Gunung Halimun National Park survey area. Ciusul upper center. Pin indicates transect # 2.

6.6 Survey of Gunung Halimun National Park

The team established seven survey points (Figure 18) located near Ciusul, to which was added similarly collected field data from another transect (Gillison CIFOR 1997). Although the rugged terrain limited the number of transects, many of the team, who had worked previously in the Park, believed that the survey points and route traversed were generally representative of the GHNP environment.

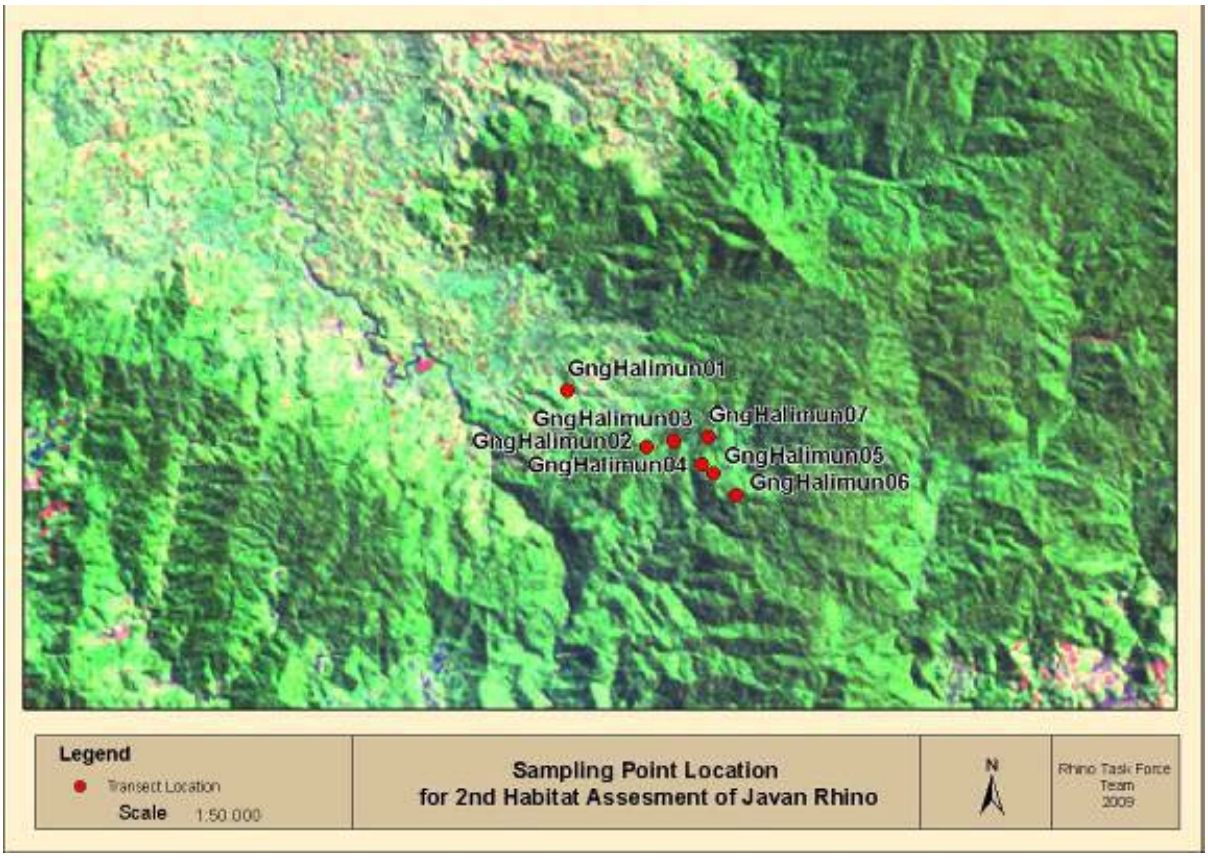


Figure 18. Transect locations in Gunung Halimun.

6.7 Results of survey

Figure 19. Example of extreme erosion in GHNP.

Recorded transect biophysical data are listed in Tables 2, 3, and 4 and in Annex III. Plant biodiversity is generally higher than that recorded for UKNP and Gunung Honje, but considerably less than that recorded using similar methodology in Sumatra (e.g., Bukit Barisan, Jambi, Riau). Farming (padi rice or *Sawah*) extends to more than 700m and the presence of invasive weed species, especially *Maesopsis emenii* and Melastomataceae (*Bellucia axinanthera, Clidemia hirta*) as well as *Chromolaena odorata*, *Mikania micrantha* and *Psidium guajava* indicates a continuing threat to any management system that requires opening of the forest canopy. Evidence from UKNP suggests that occasional opening of the canopy is necessary to promote the growth of food-plant species for rhino, normally associated with pioneer assemblages. Within GHNP, illegal mining and forest plantations are widespread. In addition, the team observed a number of examples of landscape instability as a result of some of these activities (Figure 19). While the team identified localities where rhino might survive temporarily, the highly disturbed environment coupled with intense human activity pose a continuing threat to any possibility of translocation of rhino. For these reasons, we undertook no spatial modeling of potential rhino habitat.

7. AREA 4 - LEUWEUNG SANCANG [6]

7.1 Overview of physiography, land cover and land use

The Leuweung Sancang Nature Reserve of 4,000 lies on the south coast of West Java, 40 km east of Pameunpeuk. The reserve comprises the estuaries of the Cikaengan and Ciporeang rivers that are partly covered by extensive coral reefs, mangroves swamps and sandy beaches (Figure 20). The adjacent undulating lowlands include brackish swamp forest, dry-beach forest, freshwater swamp. The reserve includes a tropical rain forest ecosystem. Of the total area, 1434 ha is tropical rain forest, 94 ha is secondary forest, 40 ha grazing ground, 509 ha is without cover (no forest) and 78 ha is rubber forest (BKSDA 1976). The region is located in Sancang village, Cibalong sub district, between 0-18m above mean sea level. Leuweung Sancang is one of the few declared international-level nature reserves in Indonesia that is yet to be impacted by tourism. Access to conservation areas in Leuweung Sancang in the Cibalong district requires a 5 hour, 118 km-long hard drive trip from Garut.

Topography and Soil

[6] Extracted from Sectionov (2009)

The Leuweung Sancang area is relatively flat (75%) rising to 177 m above sea level. Soils range from podsolics and red-yellow latosols to lithosols of volcanic origin.

Climate
Tropical maritime, with a seasonal mean annual rainfall of approximately 2500-3000 mm. The dry season occurs between June and September during the southeast monsoon. Mean temperatures range between 23 degrees °C and 35°C with a relative humidity of 92 %.

Unique animals
These include banteng (*Bos javanicus*), green peafowl (*Pavo muticus*) and muntjak (*Muntiacus muntjak*). Species of gibbon and crocodile are also found in the area.

Figure 20. Leuweung Sancang area showing remnant forest patches surrounded by intensive land use pressure.

7.2 Review of current information on biodiversity, rhino abundance and habitat

There is no established history of Javan rhino occurrence in this area.

7.3. Potential interaction with government and non-government stakeholders and local communities

Potential interaction with local stakeholders is unknown.

7.4 Conclusions

Preliminary assessment indicates that the level of human population pressure and land use intensity combined with the relatively restricted areas of potential rhino habitat mitigate against any realistic chance of successful translocation of the Javan rhino in Leuweung Sancang.

8. AREA 5 - MASIGIT KAREUMBI GAME RESERVE

8.1 Overview of physiography, land cover and land use.

The 70-ha reserve of is located between 107°57'E, 6°57'S, within the regency of West Java. (SK Mentan No.297/Kpts/Um/5/1976) (Figure 21)

Topography
Generally hilly to mountainous (Gunung Kerenceng 1736m asl) with steep slopes averaging between 20%-30% .

Climate
Mean annual rainfall of approximately 1900 mm. Mean temperatures range between 23°C and 25°C with a relative humidity between 60% and 90%.

Hydrology
The area is well served by several rivers including the Ciguruguy, Cikantap, Cimanggung, Cihanjawar, Citarik, etc. There is also evidence that animal wallows exist during the dry season.

8.2 Review of current information on biodiversity, rhino abundance and habitat.

Flora
The forest contains oaks and laurels together with numerous palms and pandans, some secondary growth with Zingiberaceae and ferns. Almost 40% of the forest is dominated by *Pinus merkusii*, bamboo and *Acacia decurrens*.

Fauna
Sambar deer (*Cervus unicolor*), wild boar (*Sus scrofa*), wild dog (*Cuon alpinus*), leopard (*Panthera pardus*), long-tailed macaque (*Macaca fascicularis*), Javan langur (*Trachypithecus auratus*), red junglefowl (*Gallus gallus*), brown-headed barbet (*Megalaima zeylanica*).

There are no known occurrences of Javan rhino in this area. From remotely sensed imagery, potential habitat conditions appear to be highly restricted.

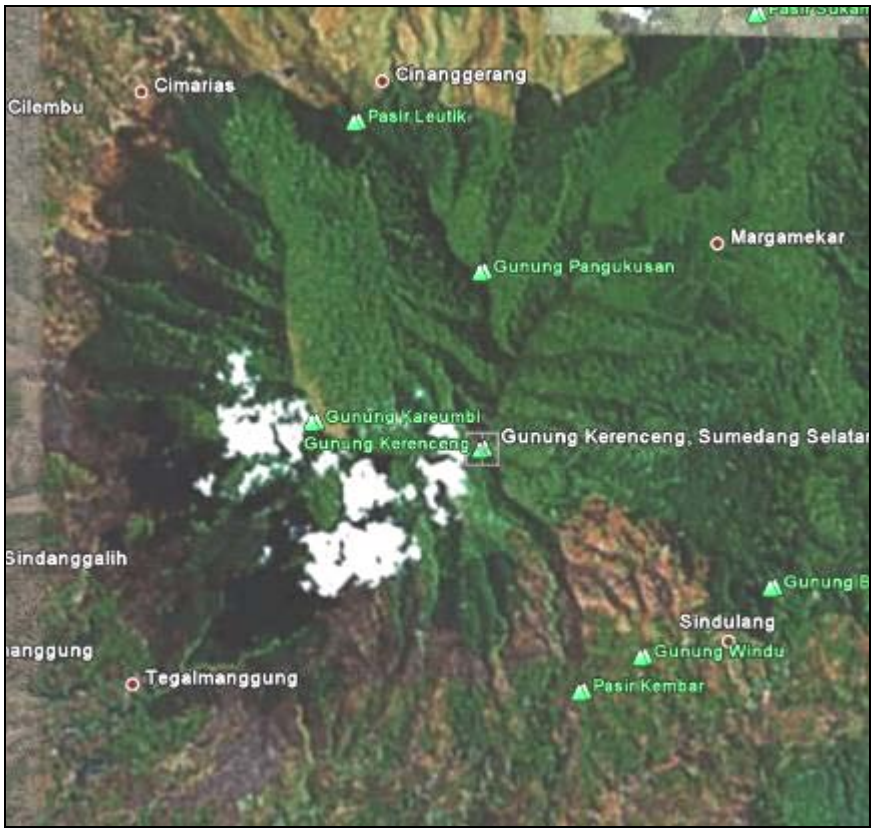


Figure 21. Masigit Kareumbi reserve surrounded by intensive land use pressure.

8.3 Potential interaction with government and non-government stakeholders and local communities.

Potential interaction with local stakeholders is unknown.

8.4 Conclusions

The relatively small size of the reserve in this mountainous terrain combined with a restricted number of likely areas for Javan rhino habitat and the surrounding high population pressure seriously limit any prospect of successful Javan rhino translocation.

9. DISCUSSION

Intensive, systematic patrolling and monitoring of the Ujung Kulon peninsula rhino population by four RPU teams in recent years has led to an in-depth understanding of environmental factors that influence rhino habitat. The comparative analysis of the three key survey areas (UKNP, Gunung Honje, GHNP) was therefore greatly assisted by the ability of

the RPUs to provide a consistent numerical ranking (1-10 point scale) of rhino habitat preference. Previous habitat assessments for Gunung Honje by Haryono (1996) and van Merm (2008) (Figures. 22, 23, Table 6) is generally consistent with the findings of the present team based on a more detailed ecological survey of the Honje lowlands and foothills and supported by a socioeconomic study (Table 5).

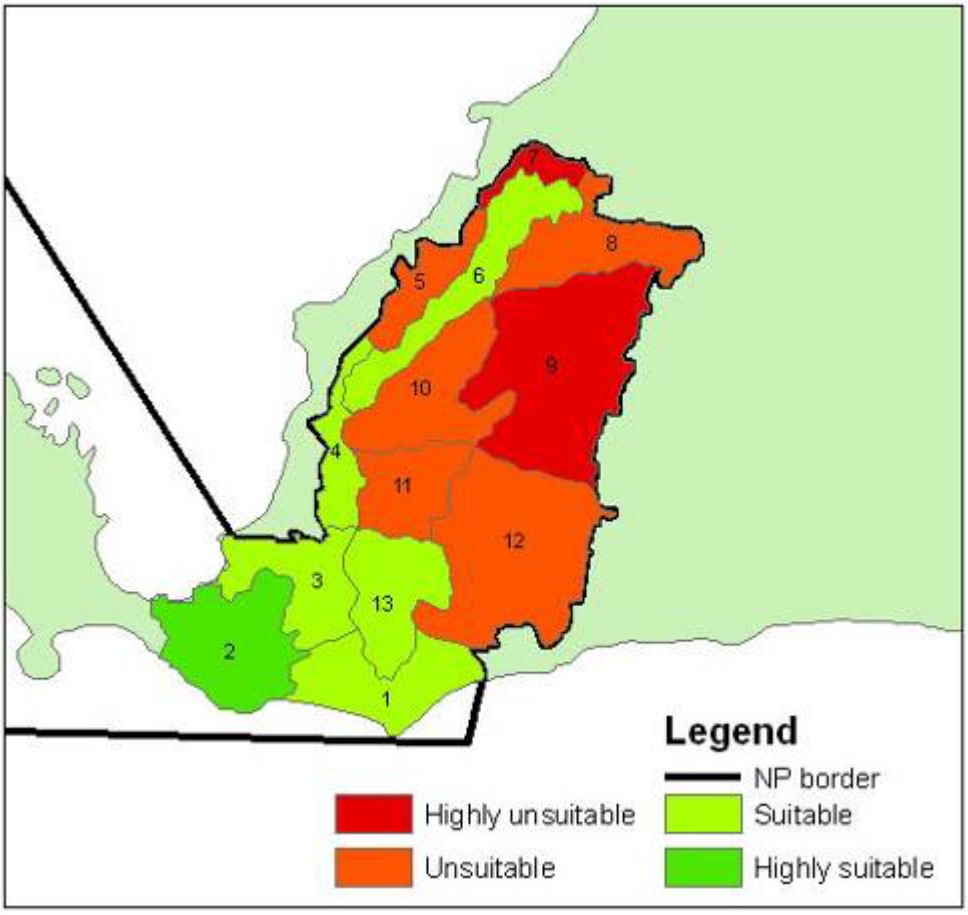


Figure 22. Rhino habitat suitability of Gunung Honje as assessed by van Merm (2008) following earlier assessment by Haryono (1996). (Block numbers follow Table 6.)

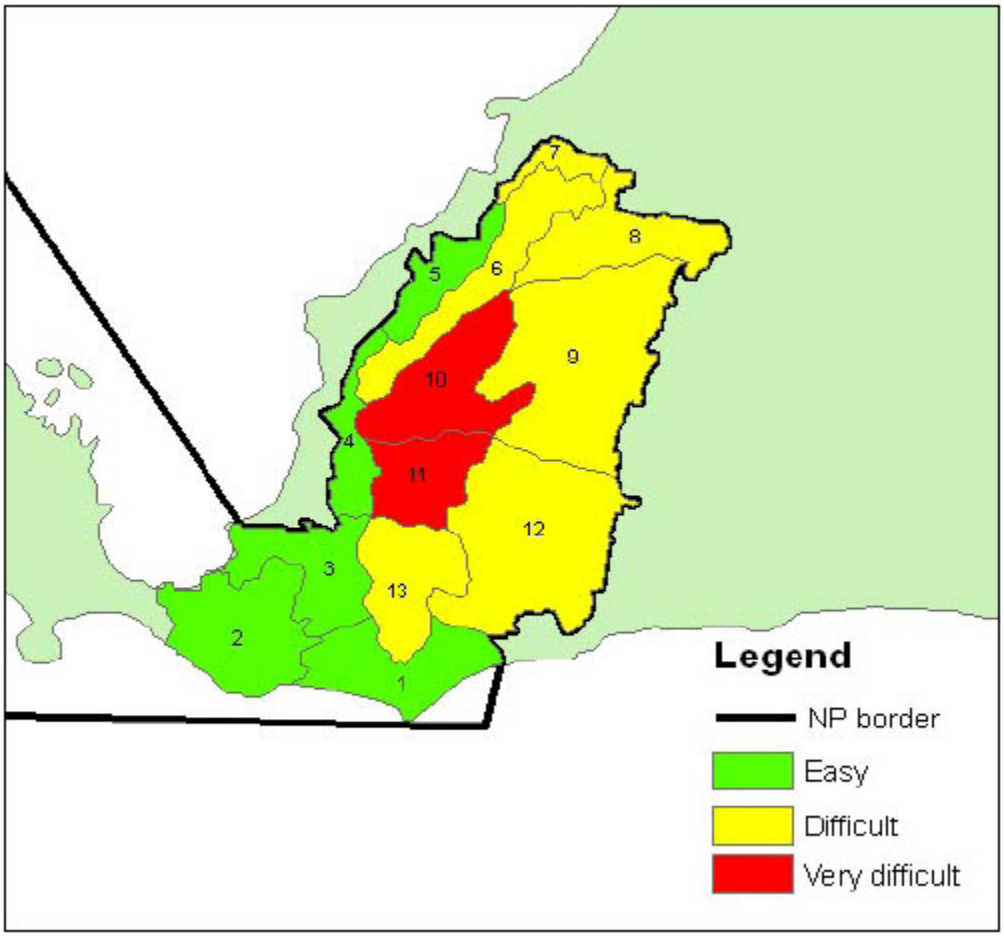


Figure 23. Rhino accessibility to the Gunung Honje area as initially defined by Haryono (1996) and modified by van Merm (2008). (Block numbers follow Table 6.)

Table 7. Water availability for rhino in Gunung Honje (from van Merm, 2008)

Block	Average number of water sources per 25 km²	Classification of water availability for rhino
1. Tanjung Sodong	3	Sufficient
2. Kalejetan	3	
3. Tanjung Lame	2	
4. Cibinua	2	
5. Cipunaga	2	
6. Cipunaga atas	1	Limited
7. Cibayoni	2	Sufficient
8. Cijaralang	3	
9. Sompok	3	
10. Gunung Honje	1	Limited
11. Gunung Ciung	1	
12. Ciakar	3	Sufficient
13. Gunung Cimahi	2	

While water availability may be reflected in Table 6, past events such as the drought of 1967 indicate that such conditions cannot be taken for granted, especially given climate-change scenarios that suggest increased warming and seasonality. For this reason, any potential relocation site should be positioned to accommodate such events as well as possible.

Of considerable concern is the current and potentially rapid invasion of *Arenga obtusifolia*, particularly given its capacity to invade and suppress regrowth under closed forest. Schenkel et al. 1978) performed pilot experiments with cutting and opening of forest that led to a significant change in light increase and thereby growth of tree saplings. They noted, "*Already two years after the cutting of palms rhino visits to the plots and feeding on saplings were observed*." While such results are promising, from a practical viewpoint, manual removal of palms is unlikely to be cost-effective. The use of rapidly degradable herbicides such as glyphosphate is likely to far more effective.

The ecological survey of peninsular UKNP and Gunung Honje has produced a reasonably clear idea of current conditions and the routes taken (much via GPS navigation through trackless vegetation cover) appear to intercept most of the heterogeneity indicated by remote sensing via Landsat and GoogleEarth. Vegetation however, is only one part of the biophysical story and more needs to be known about soil variability especially as this relates to wallow establishment, food-plant distribution and availability of mineral salts.

The spatial modeling of rhino habitat, while indicative and to a large degree consistent with the team's observations in the field, can only be regarded as a first cut. Next steps should include spatial referencing at finer scale, especially focusing on conditions that determine food-plant location and establishment together with known and potential sites for wallows both in the mid- to long-term.

Given the potentially critical impact of land use with increasing human population pressure, attention to socioeconomic issues is vital for planning purposes. While the socioeconomic survey conducted in the surrounds of Gunung Honje and GHNP has provided many useful insights, it should be regarded not as the final word but more of a framework to guide future, more detailed studies.

10. CONCLUSIONS

Javan rhino habitat preference is governed by a wide variety of biophysical site factors including sensitivity to human activity. While vegetation and elevation are clearly important determinants of rhino habitat, their influence is strongly modified by proximity to water, to mineral salt and especially to site conditions that favor the maintenance of long-term wallows. In times of drought, water scarcity can become problematical as indicated in the history of UKNP and may severely restrict rhino movement.

Historical patterns of both natural and human disturbance in Ujung Kulon have generated a mosaic of successional stages of vegetation regeneration in which the early to mid-pioneer stages were valuable sources of food-plants and where patches of mature forest provided cover. Examination of vegetation cover on ground and via remote-sensing suggest that these

mosaics are becoming increasingly homogeneous as succession moves toward closed forest. As a result, food-plant availability may be decreasing, especially where closed forest is being invaded by *Arenga*.

In Gunung Halimun, Masigit Kareumbi and Leuweung Sancang, where human activity has greatly restricted access to favorable habitat, such resources are extremely minimal. Taking into account the various biophysical elements, including the influence of human activity, we can conclude that while conditions in UKNP and adjacent Gunung Honje may not be entirely optimal for sustained management of the Javan rhino, they are considerably better than those offered in GHNP or the other two areas, where translocation would almost certainly lead to failure.

11. RECOMMENDATIONS

The following recommendations are indicated:

1. Establish a Javan rhino research and conservation area inside the Gunung Honje area to focus on the localities covering Legon Pakis, Cihujan, Cikarang, Cikalejetan, Ranca Gebang and Aermokla to Cimahi.
2. Support establishing a Javan rhino research and conservation area through intensification of active management such as:
    a. Reforestation (replanting natural forest vegetation with rhino foodplants) around Legon Pakis and Cihujan.
    b. Implementing controlled slash and burn patch management in designated and closed forest areas with careful consideration in order to promote regeneration of rhino foodplants.
    c. Increased patrol and government-initiated protection measures to ensure against poaching in both UKNP and Gunung Honje.
    d. Establish new patrol paths and additional guard posts for both RPUs and NP staff in Gunung Honje.
3. Reduce infestation by Langkap (*Arenga)* palm through a well-planned operation using environmentally friendly herbicides (e.g., glyphosphate) as applied elsewhere in national parks in other countries such as Australia.
4. Increased education programs in areas adjacent to Gunung Honje to explain the benefits of rhino conservation, thereby facilitating the groundwork for establishing a second rhino habitat.
5. Conduct a detailed consultative study to explore the likely benefits of rhino-tourism.
6. Use the study outlined in this report as a framework to undertake a more comprehensive study of the socioeconomic issues surrounding the establishment of a rhino sanctuary and related infrastructure in Gunung Honje.
7. Explore alternative approaches to land management as a means of improving livelihoods linked to active rhino management (e.g. wildlife tourism, cottage industries, agriculture intensification outside the designated conservation area).
8. Include financial and other incentives for villagers who support conservation efforts.

9. Identify families living inside the park boundary whose circumstances can be reconciled either by relocation and compensation, or by re-aligning the park boundary. Arbitration should be carried out on a case-by-case basis.
10. Establish a conservation extension and interpretative center in the Gunung Honje area.
11. Promote national and international awareness of the rhino conservation program and consider additional avenues for conservation support to include local and national governments.
12. Re-examine existing policy incentives and legal instruments surrounding rhino conservation with a view to improving conservation management.
13. Ensure funding mobilization from related government institutions, rhino conservation NGOs, and other related rhino conservation stakeholders in order to support the development of a second Javan rhino habitat.

12. ACKNOWLEDGEMENTS

This survey was truly an international and inter-organizational endeavor which reflects our mutual commitment to the long-term survival of the Javan rhino. The authors of this report are indebted to the YABI team for their untiring efforts and assistance to make this assessment a success, in particular the assistance of Pak Widodo, Pak Eeng, Pak Waladi and the RPU team in the field. The spatial modeling was successfully achieved by the combined efforts of Pak Eru and Bibhab Kumar Talukdar in the face of considerable odds.

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ANNEX I

Terms of Reference

1. Assessment of vegetation and landforms suitability for Javan rhinos. Incorporate with rhino survey information and satellite imagery.
2. Assess park holding capacity – require areas with holding capacity of at least 100 rhino assuming a need of 4.25 sq. km/rhino with sufficient food sources, and/or areas suitable for setting up sanctuary of three to four pairs for population reproduction purposes.
3. Assess the area's permanent water sources – rivers, waterholes, wallowing potential? Water quality must be good and free of pollutant (laboratory assessment)
4. Assess park security -
    - Encroachment assessment – farming, agriculture, hunting.
    - Illegal logging assessments.
    - Law enforcement and protection in the area
    - Current management capacity.
    - Potential management capacity.
5. Disease risk assessment – investigate past disease outbreak (since 1982), potential threats such as farm animals surrounding/within the park and other introduced species.
6. Assessment of invasive flora – e.g., Arenga palm and Lantana.
7. Assessment of potential competition with wildlife (i.e., wild cattle/banteng, elephants, rhinos, etc.)
8. Assessment of potential predators
9. Assessment of fire and drought risks.
10. Assessment of threat prone to natural disasters such as volcano, cyclone, earthquake, tsunami.
11. Assessment of the potential for forestation/plantation of rhino feed plants.
12. Assessment of the human growth/population and forest conversion and encroachment trends.
13. Assessment of local traditions that may positively or negatively affect conservation efforts.
14. Assessment of community and governmental (local and central) support to potential relocation and introduction of Javan rhinos.
15. Areas to be surveyed
    - Ujung Kulon National Park – Mt Honje Region
    - Berbak National Park
    - Gunung Halimun National Park
    - Harapan Forrest

Rapid Assessment

A rapid assessment will be conducted in which each of the proposed sites will be visited with the aim to narrow-down the potential sites to two.

The output of the rapid assessment shall be a referenced document for each of the four potential sites in which the area's suitability to harbor a Javan rhino population will be assessed against the criteria spelled-out in the ToR above. The team shall prepare a separate document in which the findings of each of the potential sites are discussed, the areas prioritized based on a discussion of scientific and practical (suitability, economic costs, local people's attitudes) arguments and the two most suitable sites selected as advice to the Indonesian Rhino Task Force.

The rapid assessment team shall consist of 5 members with an aim to have expertise in the following; Javan rhino ecology, Forest ecology, Rapid vegetation surveys, Rhino management and security, Wildlife diseases and community engagement.

Name	Organisation	Speciality

It is proposed that the costs for the rapid assessment shall be covered by YABI, IRF, WWF and ARP. The rapid assessment team shall be contracted by YABI.

The rapid assessment shall be conducted not later than 1 July 2009.

The team shall report to the Indonesian Rhino Task Force not later than 15 July 2009 after which the Rhino Task Force endorses the recommendation of the rapid assessment team not later than 1 August 2009 when it submits the recommendation for official approval to the Department of Wildlife in the Indonesian's Government Ministry of Forestry.

Detailed Feasibility Study

A detailed feasibility study shall be conducted in each of the two selected sites. The feasibility study shall be conducted against the same criteria as in the ToR provided above but shall be in much more depth than in the rapid assessment.

In addition the feasibility study shall come-up with a detailed and costed implementation plan of required action to prepare the area to receive a Javan rhino population. This plan shall cover the following aspects:

- Law enforcement requirements (staffing, staff training, guard posts, and equipment needs and an outline patrol schedule).
- Infrastructure requirements (temporary rhino paddocks, fencing of a 4,000 ha sanctuary, access roads and paths).
- Community engagement requirements (outreach and awareness raising).
- Mitigation of encroachments where required (indication of scope (no. of ha, no of people and households involved; compensation).
- Maintenance requirements of the above for a period of 10 years in yearly installments.
- A proposed allocation of costs towards the Indonesian Government with selected inputs from NGOs (YABI, WWF, IRF, ARP) and institutional donors (World Bank GEF, USAID, etc).

The output of the detailed assessment shall be a referenced document for each of the two potential sites in which the investments required to prepare the area to harbor a Javan rhino population. The team shall submit the document as advice to the Indonesian Rhino Task Force.

The detailed assessment team shall consist of

Name	Organisation	Speciality

It is proposed that the costs for the detailed assessment be shared between the Indonesian Government and NGOs (YABI, IRF, WWF, ARP). The detailed assessment team shall be contracted by YABI.

The detailed rapid assessment of the short-listed sites is estimated to last 6 months and shall be conducted not later than 1 January 2010.

The team shall report to the Indonesian Rhino Task Force not later than 15 January 2010 after which the Rhino Task Force shall select the best suitable site for submission to the Department of Wildlife in the Indonesian's Government Ministry of Forestry for official approval not later than 1 February 2010.

ANNEX II

List of data variables recorded for each 40 x 5m transect

Site feature	Descriptor	Data type
Location reference	Location	Alpha-numeric
	Date (dd-mm-year)	Alpha-numeric
	Plot number (unique)	Alpha-numeric
	Country	Text
Observer/s	Observer/s by name	Text
Physical	Latitude deg.min.sec. (GPS)	Alpha-numeric
	Longitude deg.min.sec. (GPS)	Alpha-numeric
	Elevation (m.a.s.l.) (aneroid or GPS)	Numeric
	Aspect (compass. deg.) (perpendicular to plot)	Numeric
	Slope percent (perpendicular to plot)	Numeric
	Soil depth (cm)	Numeric
	Soil type (US Soil taxonomy)	Text
	Parent rock type	Text
	Litter depth (cm)	Numeric
	Terrain position	Text
Site history	General description and land-use / landscape context	Text
Vegetation structure	Vegetation type	Text
	Mean canopy height (m)	Numeric
	Crown cover percent (total)	Numeric
	Crown cover percent (woody)	Numeric
	Crown cover percent (non-woody)	Numeric
	Cover-abundance (Domin) - bryophytes	Numeric
	Cover-abundance woody plants < 2m tall	Numeric
	Basal area (mean of 3) (m^2ha^{-1});	Numeric
	Furcation index (mean and cv % of 20)	Numeric
	Profile sketch of 40x5m plot (scannable)	Digital
Plant taxa	Family	Text*
	Genus	Text*
	Species	Text*
	Botanical authority	Text*
	If exotic (binary, presence-absence) #	Numeric
Plant Functional Type	Plant functional elements combined according to published rule set.	Text*
Quadrat listing	Unique taxa and PFTs per quadrat (for each of 8 (5x5m) quadrats) #	Numeric
Photograph	Hard copy and digital image #	JPEG

* Where identified, usually with voucher specimens. More detailed information available at www.cbmglobe.org

ANNEX III

List of Plant Functional Types and Plant Species for Ujung Kulon, Gunung Honje and Gunung Halimun transects

Ujung Kulon 01

PFT	Family	Genus	Species	Local name
me-la-do-ph	Apocynaceae	Alstonia	scholaris	Lame
ma-la-do-su-cr-ad	Araceae	Homalomena	sp18	
ma-la-do-ro-pv-ph-ad	Arecaceae	Arenga	obtusifolia	Aren or Lengkap
me-la-do-ro-pv-ph-li-ad	Arecaceae	Calamus	sp12	Rotan
no-la-do-ro-pv-ph-li-ad	Arecaceae	Calamus	sp17	Rotan
no-ve-do-ro-pv-ph-ad	Arecaceae	Caryota	mitis	Sayar
no-la-do-ch	Clusiaceae	Garcinia	parvifolia	
me-la-do-ph	Ebenaceae	Diospyros	macrophylla	Ki calung
no-la-do-ph	Euphorbiaceae	Glochidion	zeylanicum	Reuheun
pl-la-do-ph-li-ep	Fabaceae	Spatholobus	ferrugleus	Carulang
me-la-do-ph	Indet		sp03	Cabe
no-la-do-ct-ph	Leeaceae	Leea	sambucina	
no-la-do-fi-hc-ad-ep	Davalliaceae	Nephrolepis	sp08	
me-la-do-de-ph	Lythraceae	Lagerstroemia	flos-reginae	Bungur
pl-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis	Banbang
ma-la-do-ph-li-ad	Moraceae	Ficus	sp05	
no-co-do-ph	Myrtaceae	Syzygium	polyanthum	Salam
no-la-do-ch-li-ad-ep	Piperaceae	Piper	sp23	
mi-la-do-fi-hc-ad-ep	Polypodiaceae	Drynaria?	sp06	
no-la-do-de-ct-ph	Sterculiaceae	Pterospermum	javanicum	Bayur
ma-co-do-pv-ph-li-ad	Zingiberaceae		sp10	Hangasa
me-la-do-fi-hc-ad-ep			sp07	Fern
mi-ve-do-fi-ch-ad-ep			sp21	Fern

Ujung Kulon 02

PFT	Family	Genus	Species	Local name
ma-la-do-pv-ch-ad	Arecaceae	Arenga	obtusifolia	Langkap
ma-la-do-su-pv-hc-ad	Zingiberaceae	Amomum	melanocheilos	
me-la-do-ch-li	Convolvulaceae	Lepistemon	urceolatus	
mi-la-do-ch-li	Rhamnaceae	Zizyphus	horsfieldii	
mi-la-do-hc-li	Asteraceae	Mikania	micrantha	
mi-la-do-hc-li	Menispermaceae?		sp07	Tawulu
mi-la-do-pv-ch-ad	Arecaceae	Calamus	sp02	
no-co-do-ph	Myrtaceae	Syzygium	polyantha	
no-la-do-ch-li-ad	Verbenaceae	Lantana	camara	
no-la-do-ct-ph	Boraginaceae	Cordia	sp13	
no-la-do-hc-li	Vitaceae		sp08	Kilobur
pl-co-do-de-ct-ph	Moraceae	Ficus	obscura	
pl-la-do-ch-li-ep	Fabaceae	Derris	elliptica	
pl-la-do-ct-ph-ad	Leeaceae	Leea	sambucina	
pl-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis	Bambang

Ujung Kulon 03

PFT	Family	Genus	Species	Local name
no-la-do-ph-li	Annonaceae	Uvaria	littoralis	
ma-la-do-pv-ph-ad	Arecaceae	Arenga	obtusifolia	
no-la-do-ch-ad	Asteraceae	Chromolaena	odorata	
mi-la-do-hc-li	Asteraceae	Mikania	cordata?	
mi-la-do-ch-li	Caesalpinaceae	Caesalpinia?	sp07	
no-la-do-ch-li-ad	Convolvulaceae	Merremia	sp06	
no-la-do-ch	Elaeocarpaceae?			Kituak
no-la-do-ph-ad	Euphorbiaceae	Baccaurea	javanica	
no-la-do-ct-ph	Euphorbiaceae	Bischofia	javanica	Gadog
pl-la-do-pv-ph-li-ad-ep	Fabaceae	Spatholobus	ferrogleus	
pi-la-do-ct-ph	Lauraceae	Cinnamomum	iners	
pl-la-do-pv-ch-ad	Marantaceae	Donax	cannaeformis	
no-la-do-hc-li	Menispermaceae?			
me-la-do-ch	Myrsinaceae	Embelia	ribes	
me-la-do-ch	Rubiaceae	Tarenna?	sp21	
no-la-do-fi-ch-li	Schizaeaceae	Lygodium	circinnatum?	
pi-la-do-fi-hc-ad	Selaginellaceae	Selaginella	sp09	
no-la-do-ch-li	Smilacaceae	Smilax	macrocarpa	
pl-la-do-de-ct-ph	Sterculiaceae	Pterocymbium	tectorium	
no-la-do-ch	Urticaceae	Poikilospermum	suaveolens	
no-la-do-ch-li-ad	Vitaceae		sp25	Kupukupu
ma-la-do-su-pv-hc-ad	Zingiberaceae	Amomum	megalocheilos	Tepus?
no-la-do-hc-li-ad			sp10	Keruk
no-la-do-fi-hc-ad			sp16	Fern
no-la-do-fi-hc-ad			sp17	Fern

Ujung Kulon 04

PFT	Family	Genus	Species	Local name
no-la-do-hc-li-ad	Araceae	Pothos?	sp20	
ma-la-do-ro-pv-ph-ad	Arecaceae	Arenga	obtusifolia	
no-la-do-ro-pv-ph-li-ad	Arecaceae	Calamus	sp15	
ma-la-do-ro-pv-ph-ad	Arecaceae	Salacca	edulis	
pi-la-do-ct-ph	Dilleniaceae	Dillenia	excelsa	
me-la-do-ch	Ebenaceae	Diospyros	cauliflora	
me-la-do-ch	Lauraceae	Cinnamomum	iners	
ma-la-do-ph	Lecythidaceae	Barringtonia	macrocarpa	
no-la-do-ct-ph-ad	Leeaceae	Leea	sambucina	
me-la-do-de-ph	Lythraceae	Lagerstroemia	flos-reginae	
pl-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis	
ma-la-do-pv-hc-ad	Marantaceae?			Patat
pl-la-do-ch	Moraceae	Artocarpus	elastica	
pl-la-do-ct-ph	Myrtaceae	Syzygium	formosum	
no-la-do-ph	Myrtaceae	Syzygium	polyanthum	
no-la-do-pv-ph-li-ad	Poaceae	Schizostachyum	zolleringii	
no-la-do-ch-li-ad	Vitaceae	Cissus	sp18	
ma-la-do-su-pv-hc-ad	Zingiberaceae	Amomum	melanocheilos?	
no-la-do-ch			sp11	Harupat
no-la-do-ch			sp13	Kontor monyet
no-la-do-fi-hc-ad			sp19	Fern

Ujung Kulon 05

PFT	Family	Genus	Species	Local name
no-la-do-ch	Annonaceae	Pseuduvaria	reticulata	
no-la-do-ch	Annonaceae	Uvaria	littoralis	
no-la-do-ph	Annonaceae		sp10	Kililin
ma-la-do-ro-pv-ph-ad	Arecaceae	Arenga	obtusifolia	
mi-la-do-ro-ch-li-ad	Arecaceae	Calamus	sp08	
pl-la-do-ro-pv-ph-li-ad	Arecaceae	Calamus?	sp07	
no-la-do-ch	Ebenaceae	Diospyros	cauliflora	
no-la-do-ph	Ebenaceae	Diospyros	macrophylla	
me-co-do-ch	Euphorbiaceae	Aporusa	arborea	
pl-la-do-ct-ph	Lauraceae	Litsea	noronhae	Huru
no-la-do-ch-ad	Leeaceae	Leea	sambucina	
pl-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis	
ma-ve-do-pv-hc-ad	Marantaceae?		sp15	Patat
no-la-do-fi-hc-ad	Schizaeaceae	Lygodium	sp20	
me-la-do-de-ph	Sterculiaceae	Pterospermum	javanicum	
mi-la-do-hc-li	Vitaceae	Cayratia?	sp09	
no-la-do-hc-li-ad	Vitaceae	Cissus	sp11	
no-la-do-ch-li-ad			sp13	Kigugula
me-ve-do-ph			sp14	Waren
mi-la-do-ct-ph			sp16	Jejenukan
no-la-do-ph			sp19	Duruf

Ujung Kulon 06

PFT	Family	Genus	Species	Local name
ma-la-do-ro-su-cr-ad	Araceae	Alocasia?	sp17	
pl-la-do-ro-pv-ph-ad	Arecaceae	Areca	pumida	Bingbin
ma-la-do-ro-pv-ph-ad	Arecaceae	Arenga	obtusifolia	
no-la-do-ro-pv-ch-li-ad	Arecaceae	Calamus	sp05	
no-la-do-ro-pv-ch-li-ad	Arecaceae	Calamus	sp15	
me-la-do-ro-pv-ph	Arecaceae	Caryota	mitis	
mg-co-do-ro-pv-ph	Arecaceae	Corypha	utan	
no-la-do-su-ch-ad	Costaceae	Costus	sp16	Paching
no-la-do-ct-ph	Fabaceae	Pongamia	pinnata	
no-la-do-ch	Lauraceae	Litsea	noronhae	
me-la-do-ct-ph	Leeaceae	Leea	sambucina	
pl-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis	
ma-ve-do-pv-hc-ad	Marantaceae	Phyrnium	repens	Patat
no-la-do-ch	Moraceae	Ficus	sp10	
me-la-do-ph	Myrsinaceae	Ardisia	humilis	
no-la-do-ch	Myrtaceae	Syzygium	polyantha	
no-la-do-ch-li-ad-ep	Piperaceae	Piper	sp19	
no-la-do-hc-li-ad	Piperaceae?	Piper	sarmentosum	Karuk
me-co-do-ph	Rubiaceae	Nauclea	coadunata	
ma-la-do-su-pv-hc-ad	Zingiberaceae	Amomum	melanocheilos	

Ujung Kulon 07

PFT	Family	Genus	Species	Local name
na-ve-do-hc-ad	Acanthaceae		sp08	
nc-la-do-ch	Apocynaceae?		sp05	
no-la-do-ch	Asteraceae	Chromolaena	odorata	
mi-la-do-ro-cr	Asteraceae		sp03	
na-ve-do-th	Asteraceae		sp13	
na-la-do-ch	Caesalpinaceae	Cassia	tora?	
na-ve-do-pv-hc	Cyperaceae		sp18	
le-la-do-hc	Fabaceae		sp11	
na-la-do-hc	Fabaceae		sp15	'medic-like'
na-ve-do-hc	Goodeniaceae?		sp02	
mi-ve-do-ch	Lamiaceae		sp16	
le-la-do-ch	Mimosaceae	Mimosa	pudica	
mi-co-do-pv-hc-ad	Poaceae	Axonopus	compressus?	
na-co-do-hc-ad	Poaceae	Chrysopogon	aciculatus	
na-ve-do-pv-hc-ad	Poaceae	Ischaemum	sp10	
na-ve-do-hc	Scrophulariaceae?		sp09	
no-la-do-ch-ad	Verbenaceae	Lantana	camara	
mi-la-do-cr			sp17	

List of Plant Functional Types and plant species for Gunung Honje transects

Gunung Honje 01

PFT	Family	Genus	Species	Local name
me-la-do-ro-pv-ch-li-ad	Arecaceae	Calamus	sp07	
me-la-do-ro-pv-ch-ad	Arecaceae	Caryota	mitis	
me-la-do-ro-pv-ch-li-ad	Arecaceae	Daemonorops	sp30	
ma-la-do-ro-pv-ph-ad	Arecaceae	Licuala	gracilis	
me-la-do-ro-pv-ch-ad	Arecaceae	Salacca	edulis	
no-la-do-su-hc-ad	Costaceae	Costus	persistus	
pl-la-do-ph	Dilleniaceae	Dillenia	aurea	
no-la-do-ph	Dilleniaceae	Dillenia	aurea	
me-la-do-ch	Ebenaceae	Diospyros	celebica	
no-ve-do-ch	Ebenaceae	Diospyros	javanica	
no-la-do-ch	Euphorbiaceae	Glochidion	rubrum?	
me-ve-do-ct-ph	Euphorbiaceae	Glochidion	zeylanicum	
me-la-do-ch	Euphorbiaceae	Macaranga	tanarius?	Mara
no-la-do-ch	Euphorbiaceae	Mallotus	philippensis	
no-la-do-ch	Euphorbiacfeae	Aporusa	arborea	
me-la-do-ch-ad	Fabaceae	Derris	thyrsifolia	
no-la-do-ct-ph	Lauraceae	Dehaasia	caesia	
mi-la-do-ph	Lauraceae	Litsea	noronhae?	
me-la-do-ch-li-ad	Leeaceae	Leea	sambucina	
me-co-do-pv-ph	Liliaceae	Dracaena	fruticosa	
pl-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis	
no-la-do-ct-ph	Moraceae	Taxotrophis	taxoides	
mi-la-do-ch-li	Moraceae?		sp36	
mi-la-do-ch	Myrtaceae	Decaspermum	fruticosum	
mi-la-do-ct-ph	Myrtaceae	Decaspermum	fruticosum	
no-co-do-pv-ph-li-ad	Poaceae	Gigantochloa?	sp15	
no-la-do-ch	Rhizophoraceae	Carallia	brachiata	
me-la-do-ch	Rutaceae	Evodia	latifolia	
no-la-do-ph	Rutaceae	Micromelum	pubescens	
mi-la-do-ch-li	Smilacaceae	Smlax	sp33	
me-la-do-de-ch	Sterculiaceae	Sterculia	sp19	
no-co-do-ph	Verbenaceae	Vitex	pubescens	
me-la-do-su-pv-hc-ad	Zingiberaceae	Amomum	megacheilos	
ma-co-do-ro-pv-hc-ad		Mapania	sp05	
me-la-do-ct-ph		Oxymitra	cuneiformis	
me-la-do-ph			sp10	Ki sero
me-la-do-ch-li			sp21	kigugula

Gunung Honje 02

PFT	Family	Genus	Species	Local name
me-la-do-ch	Anacardiaceae	Buchanania	arborescens	
mi-la-do-ct-ph	Anacardiaceae	Spondias	pinnata	
ma-la-do-ro-pv-ph-ad	Arecaceae	Arenga	obtusifolia	
me-la-do-ro-pv-ch-li-ad	Arecaceae	Calamus	sp33	
pl-la-do-ro-pv-ch	Arecaceae	Caryota	mitis	
ma-la-do-pv-ph-ad	Arecaceae	Licuala	gracilis	
me-la-do-ct-ph	Clusiaceae	Garcinia	dioica	
mi-la-do-pv-hc-ad	Cyperaceae	Scleria	sp12	
me-la-do-ch-li-ad	Dilleniaceae	Tetracera	scandens	
me-la-do-ph	Ebenaceae	Diospyros	macrophylla	
me-la-do-ct-ph	Euphorbiaceae	Antidesma	bunius	
no-la-do-ph	Euphorbiaceae	Aporusa	arborea	
no-la-do-ch	Euphorbiaceae	Glochidion	rubrum	
no-la-do-ct-ph	Euphorbiaceae	Mallotus	philippensis	
me-la-do-ph	Euphorbiaceae	Sumbaviopsis	albicans	
me-la-do-ch-li	Fabaceae	Derris	thyrsifolia	
na-ve-do-ph-li-ad	Fabaceae	Millettia	glauca	
no-co-do-pv-ch-li-ad	Flagellariaceae	Flagellaria	indica	
me-la-do-ch	Lecythidaceae	Barringtonia	gargantostachyum	
me-la-do-ph	Leeaceae	Leea	sambucina	
me-co-do-ph	Lythraceae	Lagerstroemia	flos-reginae	
pl-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis	
no-ve-do-ch	Melastomataceae	Clidemia	hirta	
no-la-do-ch	Myrsinaceae	Ardisia	humilis	
mi-la-do-ch-li-ad	Rhamnaceae	Zizyphus	horsfieldii	
no-la-do-ct-ph	Rubiaceae	Randia	paniculata	
me-la-do-ch	Rubiaceae		sp22	
me-la-do-ch	Rubiaceae?		sp27	Ki koris
me-la-do-ct-ph	Sterculiaceae	Pterospermum	acerifolia	
no-la-do-ct-ph	Symplocaceae	Symplocos	sp10	
no-ve-do-ch	Thymelaeaceae	Phaleria	octandra?	
no-la-do-ch	Tiliaceae	Grewia	paniculata	
no-co-do-ph	Verbenaceae	Vitex	pubescens	
no-la-do-ch-li			sp04	Ki cha'ang

Gunung Honje 03

PFT	Family	Genus	Species	Local name
me-la-do-ph	Anacardiaceae	Buchanania	arborescens	
no-co-do-ph-li	Apocynaceae?		sp22	
ma-la-do-ro-pv-ph-ad	Arecaceae	Arenga	obtusifolia	
no-la-do-ro-pv-ch-li-ad	Arecaceae	Calamus	sp12	
pl-la-do-pv-ph	Arecaceae	Caryota	mitis	
mg-co-do-ro-pv-ph	Arecaceae	Corypha	utan	
me-la-do-ch	Clusiaceae	Garcinia	dioica	
ma-la-do-ph	Dilleniaceae	Dillenia	aurea	

PFT	Family	Genus	Species	Local name
no-la-do-ch-li	Dilleniaceae	Tetracera	scandens	
no-ve-do-pv-ph	Euphorbiaceae	Aporusa	arborea	
no-la-do-ch	Euphorbiaceae		sp16	Ki jarang
no-la-do-de-ch	Lythraceae	Lagerstroemia	flos-reginae	
me-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis	
me-la-do-ch	Myrsinaceae	Ardisia	humilis	
mi-la-do-ct-ph	Rubiaceae	Randia	patula	
mi-la-do-ph	Rutaceae	Acronychia	laurifolia	
no-la-do-ch	Sapindaceae	Erioglossum	sp11	
no-la-do-fi-ch-li	Schizaeaceae	Lygodium	sp14	
no-la-do-ch	Symplocaceae	Symplocos	contin...?	
no-la-do-ph	Tiliaceae	Grewia	paniculata	
no-la-do-ch-li			sp05	Ki cha'ang
no-la-do-ph-li			sp10	ki repet

Gunung Honje 04

PFT	Family	Genus	Species	Local name
pl-co-do-ph	Anacardiaceae	Buchanania	arborescens	
me-la-do-ph	Anacardiaceae	Dracontomelon	dahu	
me-la-do-ph	Anacardiaceae	Spondias	pinnata	
me-la-do-ph	Annonaceae	Uvaria	littoralis	
mi-la-do-hc-ad-ep	Araceae	Anadendron	microstachyum	
ma-la-do-su-hc-ad	Araceae	Homalomena	cordata?	
me-la-do-ro-pv-ch-li	Arecaceae	Arenga	obtusifolia	
no-la-do-ch-li-ad	Arecaceae	Calamus	sp04	
pl-co-do-ro-pv-ch-ad	Arecaceae	Caryota	mitis	
me-co-do-ro-pv-ch-ad	Arecaceae	Dendrocalamus	sp15	
me-la-do-ro-pv-ph-ad	Arecaceae	Dendrocalamus	sp43	
me-la-do-ro-pv-ph-ad	Arecaceae	Oncospermum	filamentosum	
me-la-do-ph	Chrysobalanaceae	Parinari	sumatrana	
no-la-do-ph	Combretaceae?		sp33	
me-la-do-ph-li-ad	Dilleniaceae	Tetracera	scandens	
me-la-do-ph	Ebenaceae	Diospyros	macrophylla	
me-la-do-ph	Euphorbiaceae	Aporusa	arborea	
no-la-do-ph	Euphorbiaceae	Baccaurea	javanica	
mi-la-do-ph	Euphorbiaceae	Bridelia	monoica	
no-la-do-ph	Euphorbiaceae	Excoecaria	virgata	
me-la-do-ph	Euphorbiaceae	Glochidion	zeylanicum	
mi-la-do-ch	Euphorbiaceae	Phyllanthus	emblica	
pl-la-do-ch	Euphorbiaceae	Sumbaviopsis	albicans	
me-la-do-ph-li-ad	Fabaceae	Derris	elliptica	
no-co-do-ro-pv-ch-li-ad	Flagellariaceae	Flagellaria	indica	
ma-la-do-ph	Lecythidaceae	Barringtonia	macrocarpa	
no-la-do-ch	Leeaceae	Leea	sambucina	
me-la-do-de-ph	Lythraceae	Lagerstroemia	flos-reginae	
me-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis	
pl-la-do-hc-ad	Marantaceae	Phyrnium	parviflorum	

PFT	Family	Genus	Species	Local name
mi-la-do-ch	Moraceae	Taxotrophis	taxoides	
me-la-do-ph	Myrtaceae	Syzygium	polyantha	
no-la-do-ph	Olacaceae	Anacolosa	frutescens	
mg-co-do-ro-pv-ph-ad	Pandanaceae	Pandanus	furcatus	
mi-la-do-ch-li	Rhamnaceae	Zizyphus	horsfieldii	
no-la-do-ch	Rubiaceae	Psychotria?	sp16	
me-la-do-ct-ph	Rutaceae	Evodia	latifolia	
no-la-do-ct-ph	Rutaceae	Micromelum	pubescens	
me-la-do-ch	Sapindaceae	Erioglossum	rubiginosum	
pl-co-do-ph	Sterculiaceae	Pterospermum	diversifolium	
no-la-do-ph	Sterculiaceae	Pterospermum	javanicum	
me-la-do-ph	Sterculiaceae	Sterculia	sp20	
pl-la-do-ct-ph	Sterculiaceae	Sterculia	sp38	
no-la-do-ph	Thymelaeaceae	Phaleria	octandra	
me-co-do-ph	Verbenaceae	Vitex	pubescens	
mi-la-do-hc-ad	Verbenaceae		sp31	
mi-la-do-su-hc-ad	Zingiberaceae	Alpinia	sp49	
me-la-do-ch-li			sp10	'Arae Ki Sero'
mi-la-do-fi-hc-ad			sp24	Fern
mi-la-do-hc			sp25	'Ki Bau'
no-la-do-ph			sp41	'Bengerr'
me-la-do-hc-li			sp52	'Arae Ki laburr'

Gunung Honje 05

PFT	Family	Genus	Species	Local name
no-la-do-ch	Actinidiaceae	Saurauia	sp31	
pl-la-do-ph	Anacardiaceae	Dracontomelon	dahu	
me-la-do-ph	Anacardiaceae	Gluta	renghas	
me-la-do-ph	Annonaceae	Oxymitra	cuneiformis	
pl-la-do-ph	Annonaceae	Uvaria	littoralis	
me-la-do-hc-li-ad	Araceae	Pothos?	sp09	
ma-la-do-pv-ch	Arecaceae	Arenga	obtusiflia	
ma-ve-do-pv-ch	Arecaceae	Arenga	obtusifolia	
ma-la-do-ro-pv-ph-ad	Arecaceae	Caryota	mitis	
me-la-do-ch	Clusiaceae	Garcinia	dioica	
ma-la-do-ch	Dilleniaceae	Dillenia	excelsa	
me-la-do-ch	Ebenaceae	Diospyros	javanica	
me-la-do-ph	Ebenaceae	Diospyros	macrophylla	
me-la-do-ch	Ebenaceae	Diospyros	pendula	
no-la-do-ch	Ebenaceae	Diospyros	sp21	
me-la-do-ch	Ebenaceae	Diospyros	sp22	
me-la-do-ch	Ebenaceae	Diospyros	sp39	
no-la-do-ch	Euphorbiaceae	Baccaurea	javanica	
no-la-do-ch-li	Fabaceae	Derris	thysiflora	
me-la-do-ch	Lauraceae	Dehaasia	caesia	
pl-la-do-ph-ad	Lecythidaceae	Barringtonia	macrophylla	
pl-la-do-ch	Lecythidaceae	Planchonia	valida	

PFT	Family	Genus	Species	Local name
ma-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis	
ma-la-do-ph	Moraceae	Artocarpus	elasticus	
me-ve-do-ch	Myristicaceae	Myristica?	sp29	'Kontor monyet'
me-la-do-ph	Myrsinaceae	Ardisia	lanceolata	
no-co-do-ph-li	Myrsinaceae	Embelia	javanica	
me-ve-do-ph	Myrtaceae	Syzygium	polyantha	
me-la-do-ch	Myrtaceae	Syzygium	sp28	
no-la-do-ch	Rhamnaceae	Zizyphus	horsfieldii	
me-la-do-ch-li	Rubiaceae	Paedaria	scandens	
me-la-do-ch	Rutaceae	Micromelum	pubescens	
me-la-do-ph	Sapindaceae	Pometia	pinnata?	
me-la-do-de-ch	Sterculiaceae	Sterculia	sp08	
no-la-do-ch	Tiliaceae	Pentace	polyantha	
me-la-do-ct-ph	Winteraceae?	Bubbia?	sp32	
me-la-do-ch			sp15	'kupu kupu'
no-la-do-hc-li			sp24	'Singa depa'
me-la-do-ch			sp26	'Ki kacang'
no-la-do-fi-hc-ad			sp27	Fern
no-la-do-ch			sp33	'Si urr'

Gunung Honje 06

PFT	Family	Genus	Species	Local name
ma-la-do-ro-pv-ph-ad	Arecaceae	Arenga	obtusifolia	
no-la-do-ph	Chrysobalanaceae	Parinari	sumatrana	
pl-la-do-ph	Dilleniaceae	Dillenia	excelsa	
me-la-do-ph	Euphorbiaceae	Aporusa	arborea	
no-la-do-ph	Euphorbiaceae	Baccaurea	javanica	
no-la-do-ph-ad	Moraceae	Ficus	elastica?	
me-la-do-ch	Myrsinaceae	Ardisia	lanceolata	
no-la-do-ph	Tiliaceae	Microcos	paniculata	
no-la-do-ch-li			sp04	'Ka sungka'
me-la-do-ch			sp05	'Ki ndog'

Gunung Honje 07

PFT	Family	Genus	Species	Local name
no-la-do-ch	Anacardiaceae	Spondias	pinnata	
no-la-do-hc-ad	Apocynaceae	Anodendron	microstachyum	
ma-co-do-ro-pv-ph	Arecaceae	Arenga	obtusifolia	
me-la-do-ro-pv-ch-li-ad	Arecaceae	Calamus	sp25	
pl-la-do-ro-pv-ch-li-ad	Arecaceae	Daemonorops	sp20	
pl-la-do-ro-pv-ch-li-ad	Arecaceae	Dendrocalamus	sp22	
mg-la-do-ro-pv-ph-ad	Arecaceae	Licuala	spinulosa	
ma-co-do-pv-hc-ad	Cyperaceae	Mapania	sp28	
pl-la-do-ph	Dilleniaceae	Dillenia	excelsa	
me-la-do-ch-li	Dilleniaceae	Tetracera	scandens	
no-la-do-ch	Ebenaceae	Diospyros	javanica	

PFT	Family	Genus	Species	Local name
no-la-do-ph	Euphorbiaceae	Baccaurea	javanica	
me-la-do-ph	Euphorbiaceae	Macaranga	tanarius?	
me-la-do-ch	Euphorbiaceae	Sumbaviopsis	albicans	
me-la-do-ph-li	Fabaceae	Derris	thyrsiflora	
me-la-do-pv-ch-li-ad	Flagellariaceae	Flagellaria	indica	
me-ve-do-pv-hc-ad	Hypoxidaceae	Curculigo	orchioides?	
pl-la-do-ch	Lecythidaceae	Barringtonia	macrocarpa	
me-la-do-ch	Lecythidaceae	Planchonia	valida	
no-la-do-ch-ad	Leeaceae	Leea	sambucina	
ma-la-do-pv-hc-ad	Marantaceae	Phrynium	parviflorum	
me-la-do-ch	Myristicaceae	Myristica	sp04	
no-la-do-ch	Myristicaceae	Myristica	sp24	'Kupu kupu'
no-la-do-ct-ph	Myrtaceae	Decaspermum	fruticosum	
mi-la-do-ch	Rubiaceae	Randia	patula	
me-la-do-ct-ph	Rubiaceae		sp26	
no-la-do-ch	Rutaceae	Micromelum	pubescens	
ma-la-do-ch	Sterculiaceae	Pterospermum	diversifolium	
me-ve-do-ph	Verbenaceae	Vitex	pubescens	
me-ve-do-su-hc-ad	Zingiberaceae	Globba	pendella?	
me-la-do-hc-ad			sp12	'Singa depa'
me-la-do-ch			sp17	'Si urr'
no-la-do-ph-li			sp34	'Ki liburr'
na-la-do-fi-hc-ad-ep			sp23	Fern

Gunung Honje 08

PFT	Family	Genus	Species	Local name
pl-la-do-ch	Anacardiaceae	Buchanania	arborescens	
no-la-do-ch	Annonaceae	Oxymitra	cuneiformis	
me-la-do-ch	Annonaceae	Stelechocarpus	burahol	
no-la-do-ph-li	Annonaceae	Uvaria	littoralis	
me-la-do-hc-li-ad	Apocynaceae	Anodendron	microstachyum	
ma-la-do-hc-li-ad-ep	Araceae	Rhaphidophora?	sp42	
me-la-do-ct-ph	Araliaceae	Polyscias	sp37	
ma-la-do-ro-pv-ph-ad	Arecaceae	Arenga	obtusifolia	
pl-co-do-ro-pv-ph-ad	Arecaceae	Daemonorops	sp03	
pl-la-do-ro-pv-ch-li-ad	Arecaceae	Daemonorops	sp06	
mg-la-do-ro-pv-ch	Arecaceae	Licuala	spinosa	
no-la-do-hc-li	Asteraceae	Mikania	micrantha	
me-la-do-ch-li	Caesalpinaceae	Phanera	sp08	
me-la-do-hc-li-ad	Convolvulaceae	Merremia	peltata	
me-la-do-su-hc-ad	Costaceae	Costus	speciosus?	
pl-la-do-ph	Dilleniaceae	Dillenia	excelsa	
no-la-do-ph	Ebenaceae	Diospyros	sp31	
no-ve-do-ct-ph	Euphorbiaceae	Baccaurea	javanica	
mi-la-do-ch	Euphorbiaceae	Bridelia	stipularis	
me-la-do-ch	Euphorbiaceae	Sumbaviopsis	albicans	
mi-la-do-ch-li	Fabaceae	Derris	sp46	
me-la-do-ch-li-ad	Fabaceae	Derris	thyrsiflora	

PFT	Family	Genus	Species	Local name
na-la-do-ch-li	Fabaceae	Millettia	sp24	
me-la-do-ph-li	Fabaceae	Spatholobus	sp45	
me-co-do-pv-ch-li-ad-ep	Flagellariaceae	Flagellaria	indica	
no-la-do-ch-li	Gnetaceae	Gnetum	costatum?	
me-la-do-ch	Lauraceae	Dehaasia	caesia	
me-la-do-ct-ph	Lauraceae	Litsea	noronhae	
pl-la-do-ph	Lecythidaceae	Barringtonia	macrocarpa	
no-la-do-ch-ad	Leeaceae	Leea	sambucina	
pl-la-do-pv-hc-ad	Marantaceae	Donax	cannaeformis	
mg-la-do-pv-hc-ad	Marantaceae	Phrynium	parviflorum	
no-la-do-ch-li	Myristicaceae	Myristica		
me-la-do-ch	Myristicaceae	Myristica?	sp48	
no-la-do-ch	Myrtaceae	Decaspermum	fruticosum	
pl-la-do-ch	Myrtaceae	Eugenia	sp56	
ma-co-do-ro-pv-ch-ad	Pandanaceae	Pandanus	sp17	
nc-co-do-pv-ch-li	Poaceae	Gigantochloa	sp52	
nc-la-do-ch	Rhamnaceae	Zizyphus	horsfieldii	
no-la-do-ch-li-ad	Rubiaceae	Uncaria	sp18	
me-la-do-ch	Rutaceae	Evodia	latifolia	
no-la-do-ph	Sapindaceae	Erioglossum	sp13	
mi-la-do-fi-hc-li	Schizaeaceae	Lygodium	circinnatum	
no-pe-do-hc-li-ad	Smilacaceae	Smilax	sp07	
pl-la-do-ph	Sterculiaceae	Pterospermum	diversifolium	
me-la-do-ph	Verbenaceae	Vitex	pubescens	
no-la-do-ch-li-ad	Vitaceae	Cayratia	geniculata	
mg-la-do-su-pv-hc-ad	Zingiberaceae	Amomum	melanocheilos	
me-la-do-su-pv-hc-ad	Zingiberaceae		sp11	
na-pe-do-fi-hc-ad-ep			sp29	Fern
no-la-do-ch-li			sp32	'Ki ngugula'
mi-la-do-hc-ad			sp38	'Singa depa'
no-la-do-ch			sp39	'Ki parapin'
no-la-do-fi-hc-ad				Fern
no-la-do-fi-hc-ad				Fern
me-la-do-ch-li-ad				'Ka sungka'

Gunung Honje 9

PFT	Family	Genus	Species	Local name
mg-co-do-ro-pv-ph	Arecaceae	Corypha	utan	
mg-la-do-ro-pv-ch	Arecaceae	Licuala	spinosa	
no-la-do-hc-li-ad-ep	Blechnaceae	Stenochlaena	palustris	
pl-la-do-ch	Dilleniaceae	Dillenia	excelsa	
me-la-do-ph	Ebenaceae	Diospyros	celebica	
me-la-do-ph	Ebenaceae	Diospyros	javanica	
me-la-do-ph	Euphorbiaceae	Aporusa	arborea	
no-la-do-ph	Euphorbiaceae		sp14	
me-la-do-ch-li-ad	Fabaceae	Derris	thyrsiflora	
me-la-do-ph	Lauraceae	Dehaasia	caesia	
me-la-do-de-ph	Lythraceae	Lagerstroemia	flos-reginae	

PFT	Family	Genus	Species	Local name
pl-co-do-ph	Moraceae	Ficus	elastica	
me-la-do-ch	Myrsinaceae	Ardisia	humilis	
no-la-do-ch	Myrtaceae	Decaspermum	fruticosum	
me-la-do-ch	Myrtaceae	Eugenia	sp09	
no-la-do-ph	Myrtaceae	Eugenia	sp23	
me-la-do-hc-ad	Pteridaceae	Acrostichum	aureum	
mi-la-do-ph-li	Rubiaceae	Uncaria	sp17	
no-la-do-ch	Thymelaeaceae	Phaleria	octandra	
me-la-do-ph	Verbenaceae	Vitex	pubescens	
no-la-do-ch	Verbenaceae		sp11	
no-la-do-ch-li			sp07	'Ki gugula'
no-la-do-ct-ph			sp19	'Bingbin'
no-la-do-fi-hc-ad				Fern

Gunung Honje 10

PFT	Family	Genus	Species	Local name
mi-la-do-hc-ad	Acanthaceae	Hemigraphis	sp09	
pl-la-do-ch	Annonaceae	Oxymitra	albicans	
no-co-do-ph	Apocynaceae	Alstonia	scholaris	
no-pe-do-su-hc-li-ad-ep	Apocynaceae	Anodendron	sp23	
me-la-do-su-cr-ad	Araceae	Alocasia	sp28	
no-la-do-su-ch-li-ad	Asclepiadaceae	Hoya	sp20	
no-la-do-ch-li-ad	Asteraceae	Chromolaena	odorata	
mi-la-do-hc-li-ad	Asteraceae	Mikania	micrantha	
no-la-do-ro-ch	Cycadaceae	Cycas	rumphii	
me-la-do-ph-li-ad	Dilleniaceae	Tetracera	scandens	
no-la-do-ch	Ebenaceae	Diospyros	javanica	
no-la-do-ch	Ebenaceae	Diospyros	maritima	
me-la-do-ph-ad	Leeaceae	Leea	sambucina	
pl-la-do-ct-ph	Meliaceae	Aglaia	latifolia	
me-co-do-ph	Meliaceae	Chisocheton	macrocarpus	
pl-la-do-ch	Myrsinaceae	Ardisia	humilis	
me-la-do-ph	Myrtaceae	Eugenia	sp14	
mi-la-do-pv-hc-ad	Poaceae	Leptaspis	sp11	
mi-la-do-pv-hc-ad	Poaceae	Paspalum	sp12	
mi-ve-do-ct-ph	Rubiaceae	Randia	patula	
pl-la-do-ph	Sapotaceae	Palaquium?	sp29	
pl-la-do-ct-ph	Urticaceae	Laportea	stimulans	
no-la-do-ch-li-ad	Verbenaceae	Lantana	camara	
me-co-do-ch-li-ad	Vitaceae	Cayratia	geniculata	
no-co-do-hc-li-ad	Vitaceae	Cissus	bicolor	
me-la-do-hc-li-ad	Vitaceae	Cissus	repens	
na-la-do-fi-hc-ad		Tectaria?	sp13	
na-la-do-fi-hc-ad			sp05	Fern
me-la-do-ct-ph			sp15	'Ki ndog'
no-la-do-ph-li-ad			sp16	'Ki liburr'
no-la-do-ph-li			sp17	'Ka kapotputchang'

Gunung Honje 11

PFT	Family	Genus	Species	Local name
no-la-do-ch	Asteraceae	Chromolaena	odorata	
me-ve-do-hc-li-ad	Convolvulaceae	Ipomoea	pes-caprae	
na-ve-do-pv-hc-ad	Cyperaceae	Scleria	sp06	
mi-ve-do-ch	Euphorbiaceae	Breynia	sp14	
na-ve-do-hc-ad	Fabaceae	Atylosia?	sp16	
na-la-do-hc-ad	Fabaceae	Zornia?	sp04	
me-ve-do-su-ch	Goodeniaceae	Scaevola	frutescens	
na-co-is-hc-li-ep-pa	Lauraceae	Cassytha	filiformis	
me-pe-do-ct-ph	Meliaceae	Aglaia	latifolia	
no-pe-do-hc-li-ad	Menispermaceae		sp011	
mg-ve-do-ro-pv-ch-ad	Pandanaceae	Pandanus	tectorius	
na-ve-do-pv-hc-ad	Poaceae	Ischaemum?	sp05	
na-ve-do-hc	Scrophulariaceae		sp17	
mi-pe-do-ch-li-ad	Verbenaceae	Lantana	camara	
me-co-do-ct-ph	Verbenaceae	Premna	corymbosa	
mi-la-do-ch-li-ad	Vitaceae	Cayratia	sp03	
me-pe-do-hc-li	Vitaceae	Cissus	repens	

Gunung Honje 12

PFT	Family	Genus	Species	Local name
no-la-do-hc	Acanthaceae		sp28	
ma-la-do-ph	Anacardiaceae	Buchanania	arborescens	
ma-la-do-su-hc-ad	Araceae	Homalomena	sp25	
pl-la-do-hc-li-ad-ep	Araceae	Rhaphidophora	sp10	
me-la-do-ro-pv-ph-ad	Arecaceae	Areca	catechu	
ma-la-do-pv-ph-ad	Arecaceae	Arenga	obtusifolia	
me-ve-do-ro-pv-ph-ad	Arecaceae	Caryota	mitis	
mg-la-do-ro-pv-ph-ad	Arecaceae	Licuala	spinosa	
me-la-do-ch	Ebenaceae	Diospyros	javanica	
me-la-do-ch	Ebenaceae	Diospyros	pendula	
no-la-do-ch	Euphorbiaceae	Baccaurea	javanica	
me-la-do-ch-li	Fabaceae	Derris	thyrsiflora	
no-la-do-ch-li	Fabaceae	Spatholobus	sp05	
no-la-do-ch	Fabaceae		sp29	
me-la-do-ch	Lauraceae	Dehaasia	caesia	
ma-la-do-ph	Lecythidaceae	Barringtonia	macrocarpa	
no-la-do-ch	Leeaceae	Leea	sambucina	
me-co-do-de-ph	Lythraceae	Lagerstroemia	flos-reginae	
me-la-do-hc-ad	Marantaceae	Donax	cannaeformis	
ma-ve-do-pv-hc-ad	Marantaceae	Phrynium	parviflorum	
me-ve-do-ch	Myrsinaceae	Ardisia	lanceolata	
me-la-do-ch	Myrsinaceae	Embelia	javanica	
me-la-do-ph	Myrtaceae	Eugenia	sp18	
me-la-do-ch	Myrtaceae	Syzygium	polyantha	
ma-co-do-ro-pv-ch-ad	Pandanaceae	Pandanus	sp07	

PFT	Family	Genus	Species	Local name
mi-la-do-ch-li	Rhamnaceae	Zizyphus	horsfieldii	
no-la-do-ch	Rubiaceae		sp27	
no-la-do-fi-hc-li-ad	Schizaeaceae	Lygodium	circinatum	
no-co-do-ph	Verbenaceae	Vitex	pubescens	
no-la-do-ch			sp06	'Ki Kugula'
no-la-do-ch-li			sp08	'Charulang'
no-la-do-ch-li			sp14	Chalana dahang'
me-la-do-hc-li-ad			sp11	'Singa depa'

Gunung Honje 13

PFT	Family	Genus	Species	Local name
me-la-do-ch	Anacardiaceae	Buchanania	arborescens	
ma-la-do-su-pv-hc-ad	Araceae	Homalomena	sp35	
ma-ve-do-ro-pv-ph-ad	Arecaceae	Arenga	obtusifolia	
no-la-do-ro-pv-ch-li-ad	Arecaceae	Calamus	sp27	
pl-la-do-ro-pv-ph-ad	Arecaceae	Caryota	mitis	
pl-la-do-ro-pv-ch-li-ad	Arecaceae	Daemonorops	sp07	
no-la-do-ph	Bignoniaceae	Rademachera	gigantea	
me-la-do-ph	Clusiaceae	Garcinia	dioica	
me-ve-do-hc-li-ad	Convolvulaceae	Merremia	peltata	
me-la-do-ch-ad	Dilleniaceae	Tetracera	scandens	
no-la-do-ph	Ebenaceae	Diospyros	javanica	
me-la-do-ph	Ebenaceae	Diospyros	pendula	
no-la-do-ct-ph	Euphorbiaceae	Aporusa	arborea	
no-la-do-ph	Euphorbiaceae	Baccaurea	javanica	
no-la-do-ch	Euphorbiaceae	Glochidion	sp20	
me-la-do-ch	Euphornbiaceae	Sumbaviopsis	albicans	
me-la-do-ch	Fabaceae	Derris	thyrsiflora	
no-la-do-ct-ph	Flacourtiaceae	Flacourtia	rukum?	
no-co-do-pv-ph-li-ad	Flagellariaceae	Flagellaria	indica	
me-la-do-ch	Lauraceae	Cinnamomum	diversifolium?	
no-la-do-ph	Lauraceae	Dehaasia	caesia	
me-co-do-ph	Lauraceae	Litsea	sp37	
ma-la-do-ph	Lecythidaceae	Barringtonia	macrocarpa	
me-ve-do-de-ph	Lythraceae	Lagerstroemia	flos-reginae	
pl-la-do-hc-ad	Marantaceae	Donax	cannaeformis	
no-la-do-ph	Myrtaceae	Eugenia	sp06	
no-la-do-ph	Myrtaceae	Eugenia	sp25	
me-la-do-ch	Myrtaceae	Eugenia	sp49	
no-la-do-ph	Myrtaceae	Syzygium	sp43	
mi-la-do-ch	Rhamnaceae	Zizyphus	horsfieldii	
me-co-do-hc-li-ad-ep	Rubiaceae	Morinda	sp45	
mi-la-do-ch	Rubiaceae	Randia	patula	
me-la-do-ch	Rubiaceae		sp16	
me-la-do-ct-ph	Rutaceae	Evodia	latifolia	
no-la-do-ch	Sapindaceae	Erioglossum	sp18	
ma-la-do-ct-ph	Sapotaceae		sp42	
no-la-do-fi-hc-li	Schizaeaceae	Lygodium	circinatum	

PFT	Family	Genus	Species	Local name
no-la-do-ch-li-ad-ep	Smilacaceae	Smilax	sp47	
me-la-do-de-ch	Sterculiaceae	Sterculia	sp17	
me-ve-do-ph	Verbenaceae	Vitex	pubescens	
no-la-do-hc-ad	Verbenaceae		sp21	
pl-la-do-su-hc-ad	Zingiberaceae	Alpinia?	sp33	
pl-la-do-ct-ph			sp02	'Ki se urr'
no-ve-do-ch			sp04	'Ki charang de ha'
no-la-do-ph			sp13	'Ka kaduan'
no-la-do-ch			sp21	'Ka sakot jengkol'
no-la-do-hc-ad			sp24	'Singa depa'
me-la-do-ph			sp30	'Ki uu lama'
no-la-do-ph			sp36	'Ki ndog'
me-la-do-ch			sp40	'Se urrgel?'
me-la-do-ct-ph			sp48	'Hulu tumbile'

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PFT	Family	Genus	Species	Local name
me-la-do-su-hc-ad	Araceae		sp18	
ma-la-do-pv-cr	Araceae		sp46	
pl-la-do-ch-li	Arceaceae	Calamus	sp13	
pl-la-do-pv-ph	Arecaceae	Arenga	obtusifolia	
no-la-do-ro-su-pv-hc-ad	Arecaceae	Calamus	sp41	'Rotan hijau'
ma-la-do-ph-ad	Arecaceae	Caryota	mitis	
pl-la-do-ro-pv-ch-li-ad	Arecaceae	Daemonorops	sp33	
no-la-do-de-ch	Bombaceae	Neesia	altissima	
me-la-do-ct-ph	Burseraceae	Canarium	sp30	
me-la-do-ch	Clusia	Garcinia	dioica	
me-la-do-ph	Dipterocarpaceae		sp47	'Ki tenjo'
me-la-do-ph	Ebenaceae	Diospyros	macrophylla	
me-la-do-ch	Euphorbiaceae	Baccaurea	javanica	
me-la-do-ch	Euphorbiaceae	Sumbaviopsis	albicans	
ma-la-do-ph	Fabaceae	Parkia?	sp23	
me-la-do-ch	Flacourtiaceae	Flacourtia	rukum	
pl-la-do-ph	Lecythidaceae	Barringtonia	macrophylla	
me-la-do-de-ch	Lythraceae	Lagerstroemia	flos-reginae	'Bungurr'
me-la-do-hc-ad	Marantaceae	Donax	cannaeformis	
ma-la-do-hc-ad	Marantaceae	Phrynium	parviflorum	
no-la-do-ph	Myristicaceae	Myristica	sp32	'Kontor monyet'
me-la-do-ph	Myrsinaceae	Ardisia	Lanceolata	
me-la-do-ph	Myrtaceae	Decaspermum	frutescens	
me-la-do-ph	Myrtaceae	Eugenia	polycephala	
no-la-do-ph	Myrtaceae	Syzygium	polyantha	
mi-la-do-ch	Olacaceae	Strombosia	javanica	
mi-la-do-ch	Rubiaceae	Randia	patula	
no-la-do-ph	Rubiaceae		sp01	
no-la-do-ch	Rubiaceae		sp17	
me-la-do-ch	Sapindaceae	Erioglossum	rubiginosum	
le-la-do-fi-hc-ad	Selaginellaceae	Selaginella	wildenowii?	

PFT	Family	Genus	Species	Local name
pi-la-do-de-ch	Sterculiaceae	Sterculia	sp34	
me-la-do-fi-hc-ad	Tectariaceae	Tectaria	sp15	
no-la-do-fi-hc-ad	Tectariaceae	Tectaria	sp16	
no-la-do-ph	Theaceae	Schima	wallichii	
no-la-do-ch	Thymelaeaceae	Phaleria	octandra	
no-pe-do-hc-li-ad	Vitaceae	Cissus	bicolor?	
ma-la-do-su-pv-hc-ad	Zingiberaceae	Amomum	melanocheilos	
no-la-do-ph			sp05	'Se eurr gelang'
no-la-do-ch-li			sp08	'Carulan'
no-la-do-ch			sp10	'cacabean'
no-la-do-hc			sp22	'Sarau nanbulu'
no-la-do-ch-li			sp26	'Wurungan'
no-la-do-ph			sp34	'kakaduan'
no-la-do-ch			sp36	'Ki parapin'
no-la-do-ch			sp37	'Ki kadu'
no-la-do-ch-li			sp38	'Ki luburr'
na-pe-do-fi-hc-ad			sp48	Fern

Gunung Honje 15

PFT	Family	Genus	Species	Local name
ma-co-do-ro-pv-ch-ad	Agavaceae	Cordyline	terminalis?	
no-la-do-su-hc-li-ad-ep	Araceae		sp25	
me-co-do-ro-pv-ph-ad	Arecaceae	Areca	catechu	
ma-la-do-ch-ad	Arecaceae	Arenga	obtusifolia	
no-la-do-ch-li-ad	Arecaceae	Calamus	sp17	
no-la-do-ro-pv-ch-li-ad	Arecaceae	Calamus	sp44	'Rotan cacing'
me-la-do-pv-ch-li-ad	Arecaceae	Daemonorops	sp14	
no-la-do-fi-hc-ad	Blechnaceae	Stenochlaena	palustris	
no-la-do-ph	Clusiaceae	Garcinia	dioica	
pl-la-do-ph	Dilleniaceae	Dillenia	excelsa	
me-ve-do-ch-li-ad	Dilleniaceae	Tetracera	scandens	
ma-la-do-ph	Dipterocarpaceae	Dryobalanops	sp10	
pl-la-do-ph	Dipterocarpaceae		sp46	
me-la-do-ph	Ebenaceae	Diospyros	javanica	
no-la-do-ph	Ebenaceae	Diospyros	javanica	
no-ve-do-ct-ph	Euphorbiaceae	Aporusa	arborea	
me-la-do-ph	Euphorbiaceae?		sp11	'Ki pari'
me-la-do-ch-li	Fabaceae	Derris	thyrsiflora	
me-la-do-ch	Fabaceae		sp07	'Jengkot'
me-la-do-ct-ph	Lauraceae	Cinnamomum	iners	
me-la-do-ph	Lauraceae	Dehaasia	caesia	
me-la-do-ct-ph	Lauraceae	Litsea	noronhae	
pl-la-do-ct-ph	Lauraceae	Litsea	sp24	
pl-la-do-ch	Lecythidaceae	Barringtonia	macrocarpa	
me-la-do-ph-ad	Leeaceae	Leea	sambucina	
pl-la-do-hc-ad	Marantaceae	Donax	cannaeformis	
me-la-do-ct-ph	Meliaceae	Aglaia?	sp51	
no-la-do-ct-ph	Meliaceae?		sp20	

PFT	Family	Genus	Species	Local name
me-la-do-ch-li	Menispermaceae	Sarcopetalum	macrophylla	
me-co-do-de-ct-ph	Moraceae	Ficus	callosa	
me-la-do-ph	Myristicaceae	Myristica	sp12	
me-la-do-ch	Myrsinaceae	Ardisia	lanceolata	
me-co-do-ph	Myrtaceae	Eugenia	cuprea	
no-la-do-ch	Myrtaceae	Eugenia	sp38	
no-la-do-ph	Myrtaceae	Eugenia	spicata	
me-la-do-ro-pv-ch-li-ad-ep	Pandanaceae	Freycinetia	sp03	
na-la-do-ch	Rhizophoraceae	Anisophyllea	disticha	
pl-la-do-ch-li	Rubiaceae		sp09	
me-la-do-ct-ph	Sapindaceae	Xerospermum	norhonianum	
le-la-do-hc-ad	Selaginellaceae	Selaginella	sp05	
no-la-do-ct-ph	Tiliaceae	Pentara	polyantha	
no-la-do-pv-hc-ad			p35	
me-la-do-ph-li			sp04	'Ki cepotpudchang'
me-co-do-ph-li-ad			sp08	'Kasongket'
no-la-do-ch			sp19	'Ki parapin'
no-la-do-ch-li			sp26	'Ki carolang'
no-la-do-ch-li			sp30	'Ki rapet'
no-la-do-ch			sp32	'Ki lamparr'
no-la-do-ch			sp34	'Ki loho'
no-la-do-ct-ph			sp37	'Ki kacangan'
no-la-do-ch			sp40	'Se urr'
pl-la-do-ph			sp41	'Hantap'
no-la-do-ch			sp55	Carangdahan'
me-la-do-ch			sp57	'Ki bulu'
me-la-do-ch			sp63	'Dudukuan'
no-la-do-ch				'Zirak'

Gunung Honje 16

PFT	Family	Genus	Species	Local name
no-la-do-ph	Anacardiaceae	Dracontomelon	dahu	
pl-la-do-ch	Anacardiaceae	Gluta	renghas	
no-la-do-ph	Annonaceae	Oxymitra	cuneiforms	
ma-la-do-su-hc-ad	Araceae	Homalomena	sp43	
ma-la-do-ro-pv-ch-ad	Arecaceae	Arenga	obtusifolia	
no-la-do-ro-pv-ph-li-ad	Arecaceae	Calamus	sp36	
pl-la-do-ro-pv-ph	Arecaceae	Caryota	mitis	
me-la-do-de-ph	Burseraceae	Canarium	sp18	
no-la-do-ph	Chrysobalanaceae	Parinari	sumatrana	
ma-la-do-su-pv-hc-ad	Commelinaceae		sp30	
me-pe-do-ph	Ebenaceae	Diospyros	javanica	
me-la-do-ch	Euphorbiaceae	Baccaurea	javanica	
mi-la-do-ch	Euphorbiaceae	Bridelia	aspera	
me-la-do-ch	Euphorbiaceae	Sumbaviopsis	albicans	
me-la-do-ct-ph	Lauraceae	Litsea	sp22	
me-la-do-ph-ad	Leeaceae	Leea	sambucina	
no-la-do-ch	Meliaceae	Agalia	latifolia	

PFT	Family	Genus	Species	Local name
me-la-do-ph	Meliaceae	Chisocheton	macrocarpa	
no-ve-do-de-ct-ph-ad	Moraceae	Ficus	sp48	
me-la-do-de-ct-ph	Moraceae	Ficus	variegata?	
no-la-do-ph	Myristicaceae	Myristica	sp12	
me-la-do-ph	Myristicaceae	Myristica	sp19	
no-la-do-ch	Myrtaceae	Decaspermum	frutescens	'Ipis kulit'
mi-la-do-ph	Myrtaceae	Eugenia	sp14	
me-la-do-ct-ph	Myrtaceae		sp11	
no-la-do-ch-li-ad	Piperaceae	Piper	sp17	
mi-la-do-ph	Rhamnaceae	Zizyphus	horsfieldii	
no-la-do-ch	Rubiaceae	Lasianthus?	sp38	
mi-la-do-hc-li-ad	Rubiaceae	Nertera	depressa	
mi-la-do-ct-ph	Rubiaceae	Randia	patula	
no-la-do-ct-ph	Rubiaceae	Randia	patula	
no-la-do-ph	Rubiaceae		sp25	
no-la-do-ph	Rutaceae	Micromelum	pubescans	
no-la-do-ph	Sapindaceae	Erioglossum	rubiginosum	
no-la-do-ph	Sapotaceae		sp33	
no-la-do-fi-hc-li	Schizaeaceae	Lygodium	circinatum	
no-la-do-de-ph	Sterculiaceae	Pterospermum	diversifolium	
ma-la-do-fi-hc-ad	Tectariaceae	Tectaria	sp31	
mi-la-do-ch	Thymelaeaceae	Phaleria	octandra	
no-la-do-ct-ph	Verbenaceae	Vitex	pubescens	
me-la-do-ch	Verbenaceae?		sp10	
ma-la-do-su-hc-ad	Zingiberaceae	Alpinia	sp41	
ma-la-do-su-pv-hc-ad	Zingiberaceae	Globba	sp20	
me-la-do-ph			sp06	'Ki ganik'
mi-la-do-ch-li			sp13	'Ki rapet'
no-la-do-ch-li			sp37	'Kupu kupu'
no-la-do-ch-li-ad			sp39	'Ki kunti'
pl-la-do-ch			sp47	'Ki koris'

Gunung Honje 17

PFT	Family	Genus	Species	Local name
ma-la-do-su-hc-ad	Araceae	Homalomena	sp23	
no-la-do-ct-ph	Araliaceae	Polyscias	sp17	
me-la-do-ch-li-ad-ep	Convolvulaceae	Merremia	peltata	
no-la-do-su-pv-hc-ad	Costaceae	Costus	speciosus cf.	
ma-co-do-su-cr	Cyperaceae	Mapania	sp49	
mi-co-do-pv-hc-ad	Cyperaceae	Scleria	sp24	
pl-la-do-ph	Dilleniaceae	Dillenia	obovata	
no-la-do-ch-li-ad	Dilleniaceae	Tetracera	scandens	
me-pe-do-de-cr-li	Dioscoreaceae	Dioscorea	sp54	
no-la-do-ph	Ebenaceae	Diospyros	javanica	
no-la-do-ch	Euphorbiaceae	Aporusa	arborea	
no-la-do-ch	Euphorbiaceae	Bridelia	monoica	
mi-la-do-ct-ph	Euphorbiaceae	Bridelia	stipularis	
no-la-do-ph	Euphorbiaceae	Glochidion	sp11	

PFT	Family	Genus	Species	Local name
na-ve-do-de-ct-ph	Fabaceae	Adenanthera?	sp15	
me-la-do-ch-li	Fabaceae	Derris	elliptica	
na-la-do-ch-li	Fabaceae		sp09	
no-la-do-pv-ch-li	Flagellariaceae	Flagellaria	indica	
me-co-do-pv-hc-ad	Hypoxidaceae	Curculigo	orchioides	
no-la-do-pv-ch	Lamiaceae		sp28	
no-la-do-ph	Lauraceae	Cinnamomum	iners	
ma-la-do-ct-ph	Lecythidaceae	Barringtonia	macrocarpa	
no-la-do-ph-ad	Leeaceae	Leea	sambucina	
ma-la-do-pv-hc-ad	Marantaceae	Phrynium	parviflora	
no-la-do-ch	Melastomataceae	Melastoma	affine?	
me-la-do-ch	Meliaceae	Chisocheton	macrophylla	
ma-la-do-ch	Moraceae	Artocarpus	elasticus	
ma-la-do-de-ph	Moraceae	Ficus	fistulosa	
no-la-do-ch	Myristicaceae		sp47	
no-la-do-ch	Myrsinaceae	Ardisia	lanceolata	
no-la-do-ch	Myrtaceae	Eugenia	polyantha	
no-la-do-ch	Myrtaceae	Eugenia	polyantha	
mg-co-do-ro-pv-ph-ad	Pandanaceae	Pandanus	sp01	
no-la-do-pv-hc-ad	Poaceae	Leptaspis (scrotochloa?)	sp51	
mi-la-do-hc	Rubiaceae	Borreria	alata	
no-la-do-ch-li-ep	Rubiaceae	Mussaenda	frondosa?	
pl-la-do-ct-ph	Rubiaceae	Psychotria?	sp20	
mi-la-do-ch	Rubiaceae	Randia	patula	
pi-la-do-ph	Rubiaceae/	Neonauclea?	sp45	
no-la-do-ch	Sapindaceae	Erioglossum	rubiginosum	
no-la-do-fi-hc-li	Schizaeaceae	Lygodium	circinnatum ?	
no-la-do-ch	Tiliaceae	Pentara	polyantha	
pi-la-do-ch	Urticaceae	Dendrocnide?	sp50	
no-co-do-ph	Verbenaceae	Vitex	pubescens	
no-la-do-ct-ph	Verbenaceae	Viticipremna cf.	sp53	
mi-la-do-hc-li-ad-ep	Vitaceae	Cayratia	sp31	
pl-la-do-su-pv-hc-ad	Zingiberaceae	Alpinia	sp25	
ma-la-do-su-pv-hc-ad	Zingiberaceae	Globba	sp18	
no-la-do-ch-li			sp14	'Ki wurungan'
no-la-do-ch-li			sp33	'Ki gugula'
mi-la-do-hc-ad			sp37	'Ki repet'
me-la-do-ch			sp52	'Ki melati'
mi-la-do-ch			sp19	'Ka ma urr'
no-la-do-hc-ad			sp35	'Singa depa'

List of Plant Functional Types and plant Species for Gunung Halimun transects

GunungHalimun 01

PFT	Family	Genus	Species	localName
no-la-do-ct-ph	Annonaceae	Annona	sp08	
no-ve-do-ct-ph	Araliaceae	Polyscias	sp30	
ma-la-do-ro-pv-ch-ad	Arecaceae	Arenga	pinnata	
me-la-do-ch	Asteraceae	Chromolaena	odorata	
no-la-do-hc-li-ad	Asteraceae	Mikania	micrantha	
no-la-do-ch	Asteraceae		sp19	
le-la-do-fi-hc-ad	Blechnaceae	Blechnum	sp14	
no-la-do-fi-hc-ad	Blechnaceae	Blechnum	sp20	
no-la-do-ct-ph	Bombacaceae	Durio	zibethinus	
no-co-do-ch	Boraginaceae?		sp31	'Ki centong'
na-co-do-pv-hc-ad	Cyperaceae		scleria/	
me-co-do-pv-hc-ad	Cyperaceae		sp18	
na-la-do-fi-hc-ad	Davalliaceae	Nephrolepis	hirsutula?	
le-la-do-fi-hc-ad	Dennstaedtiaceae	Pteridium	esculentum	
no-pe-do-de-cr-li	Dioscoreaceae	Dioscorea	hispida	
me-pe-do-de-cr-li-ad-ep	Dioscoreaceae	Dioscorea	sp43	
na-la-do-ct-ph	Euphorbiaceae	Bridelia	sp47	
ma-pe-do-ct-ph	Euphorbiaceae	Macaranga	tanarius?	
ma-la-do-ch	Euphorbiaceae	Macaranga	triloba	
me-pe-do-ct-ph	Euphorbiaceae	Omalanthus	populifolius?	
na-la-do-ct-ph	Fabaceae	Peltophorum	pterocarpum	
me-co-do-ch	Flacourtiaceae	Casearia	flavivirens	
le-la-do-fi-hc-li-ad	Gleicheniaceae	Dicranopteris	linearis	
pl-co-do-pv-hc	Hypoxidaceae	Curculigo	orchioides	
no-la-do-ch	Malvaceae	Urena	lobata	
pl-la-do-ch	Melastomataceae	Bellucia	axinanthera	
no-la-do-ch	Melastomataceae	Clidemia	hirta	
no-la-do-ch	Melastomataceae	Melastoma	malabathricum	
le-la-do-hc	Mimosaceae	Mimosa	pudica	
no-la-do-ch	Myrtaceae	Decaspermum	frutescens?	
me-ve-do-ch	Myrtaceae	Psidium	guajava	
me-la-do-ch-ad	Piperaceae	Piper	aduncum	
me-co-do-pv-hc-ad	Poaceae	Imperata	cylindrica	
mi-la-do-pv-hc-ad	Poaceae		sp16	
na-la-do-hc	Polygalaceae	Polygala	chinensis	
mg-ve-do-fi-hc-ad	Polypodiaceae	Drynaria	sp21	
no-co-do-ph	Rhamnaceae	Maesopsis	eminii	
me-pe-do-ch-li-ad	Rosaceae	Rubus	moluccanus	
mi-la-do-hc	Rubiaceae	Borreria	alata	
me-co-do-ch	Sapindaceae	Nephelium	lappaceum	
mi-la-do-fi-hc-li-ad	Schizaeaceae	Lygodium	circinnatum	
pi-la-do-fi-hc-ad	Selaginallaceae	Selaginella	sp28	
no-pe-do-ch-li-ad	Smilacaceae	Smilax	zeylanica	
mi-la-do-ct-ph	Symplocaceae	Symplocos	sp27	
me-la-do-ch	Symplocaceae	Symplocos	sp48	
no-la-do-ch-ad	Verbenaceae	Lantana	camara	

PFT	Family	Genus	Species	localName
me-la-do-ct-ph	Verbenaceae	Premna	corymbosa	
mi-la-do-ch	Verbenaceae	Stachytarpheta	jamaicensis	
no-la-do-fi-hc-ad			sp22	Fern
na-ve-do-hc			sp34	

Gunung Halimun 02

PFT	Family	Genus	Species	localName
pi-co-do-ro-pv-ch-ad	Agavaceae	Cordyline	terminalis?	
mi-la-do-hc-li-ad	Apocynaceae		sp23	
me-pe-do-pv-hc	Araceae	Anodendrum	microstachya	
me-co-do-ro-su-hc-li-ad-ep	Araceae	Epipremnum?	sp09	
ma-ve-do-su-pv-hc-ad	Araceae	Homolaena	cordata	
na-la-do-su-hc-ad-ep	Araceae	Pothos?	sp43	
no-co-do-so-hc-li-ad-ep	Araceae	Pothos?	sp65	
me-la-do-su-pv-ch	Araceae		sp46	
no-la-do-ct-ph-ad	Araliaceae	Polyscias	sp24	
me-la-do-ch-ad-ep	Araliaceae	Schefflera	javanica	
pl-la-do-ro-pv-ch-ad	Arecaceae	Areca	pumida	
ma-co-do-ro-pv-ph-ad	Arecaceae	Caryota	mitis	
me-co-do-ro-pv-ch-ad	Arecaceae	Daemonorops	sp41	
pi-la-do-ro-pv-ph-ad	Arecaceae	Licuala	spinosa	
ma-co-do-ro-pv-hc-ad	Arecaceae	Plectocomia	elongata	
mi-la-do-su-hc-ad-ep	Asclepiadaceae	Hoya	sp14	
ma-ve-do-fi-hc-ad-ep	Aspleniaceae	Asplenium	nidus	
pl-la-do-de-ct-ph	Bombacaceae	Neesia	altissima	
le-la-do-ro-fi-ph-ad	Cyatheaceae	Cyathea	pubescens	
no-pe-do-de-cr-li	Dioscoreaceae	Dioscorea	sp50	
no-co-do-ph	Elaeocarpaceae	Sloanea?	sp33	
mi-co-do-ph-ad-ep	Ericaceae	Agapetes	sp51	
na-co-do-ph-ad-ep	Ericaceae	Vaccinium	sp49	
ma-la-do-ch	Euphorbiaceae	Macaranga	triloba	
me-co-do-ph	Fagaceae	Quercus	sondaica	
mi-pe-do-su-hc-li-ad-ep	Gesneriaceae		sp88	
me-la-do-ch	Lauraceae	Dehaasia	caesia	
me-la-do-ct-ph	Lauraceae	Litsea	impressa	
no-la-do-ch-ad	Leeaceae	Leea	sp61	
pi-la-do-ct-ph	Melastomataceae	Bellucia	axinanthera	
no-la-do-ch-li-ad	Melastomataceae	Clidemia	hirta	
mi-la-do-hc-li-ad-ep	Moraceae	Ficus?	sp37	
me-la-do-ct-ph	Myrsinaceae	Ardisia	lanceolata	
no-la-do-ch	Myrtaceae	Decaspermum	frutescens?	
no-la-do-ct-ph	Myrtaceae	Eugenia	cymosa	
me-la-do-ch	Myrtaceae	Eugenia	opaca	
no-la-do-ph	Myrtaceae	Eugenia	subglauca	
no-ve-do-so-su-hc-ad-ep	Orchidaceae	Bulbophyllum	sp34	
mi-la-do-su-hc-ad	Orchidaceae	Malaxia	sp25	
ma-co-do-su-pv-hc-ad	Orchidaceae	Phaius	indigoferus?	

PFT	Family	Genus	Species	localName
le-la-do-so-su-hc-ad-ep	Orchidaceae		sp39	
no-la-do-so-su-hc-ad-ep	Orchidaceae		sp40	
no-la-do-so-su-pv-hc-ad-ep	Orchidaceae		sp52	
no-la-do-so-su-pv-hc-ad-ep	Orchidaceae		sp53	
no-co-do-pv-ch-li-ad-ep	Pandanaceae	Freycinetia	javanica?	
me-co-do-ro-pv-ch-li-ad-ep	Pandanaceae	Freycinetia	sp10	
mg-co-do-ro-pv-ch-ad	Pandanaceae	Pandanus	sp11	
mi-co-do-pv-ch-li-ad	Poaceae	Bambusa	sp59	
me-la-do-ch	Rubiaceae	Lasianthus?	sp45	
no-la-do-ch-li-ad-ep	Rubiaceae	Morinda	sp05	
me-la-do-ch	Rubiaceae	Morinda	sp27	
me-la-do-ct-ph	Rubiaceae	Urophyllum	glabrum	
pi-la-do-fi-hc-ad	Selaginellaceae	Selaginella	sp56	
me-la-do-hc-li-ad	Smilacaceae	Smilax	sp60	
no-la-do-de-ch	Sterculiaceae	Sterculia	sp15	
no-la-do-ch	Symplocaceae	Symplocos	fasiculata	
no-la-do-fi-hc-ad	Tectariaceae	Tectaria	sp20	
no-la-do-ct-ph	Theaceae	Schima	wallichii	
no-la-do-ct-ph	Theaceae	Thea	sinensis??	
mi-la-do-su-hc-ad	Urticaceae	Elatostema	sp32	
me-la-do-su-pv-hc-ad	Zingiberaceae	Globba	sp04	
no-la-do-fi-hc-ad-ep			sp13	Fern
na-la-do-fi-hc-ad-ep			sp17	Fern
me-la-do-ch			sp42	'Jengkot'
no-la-do-fi-hc-ad			sp47	Fern
me-la-do-ph			sp57	'Madja'

Gunung Halimun 03

PFT	Family	Genus	Species	Local name
me-la-do-ch	Actinidiaceae	Saurauia	sp11	
pl-la-do-ch	Annonaceae	Goniothalamus	macrophylla	
ma-la-do-so-su-hc-ad	Araceae	Alocasia?	sp09	
no-pe-do-su-hc-li-ad-ep	Araceae	Pothos?	sp06	
me-la-do-su-hc-li-ad-ep	Araceae	Pothos?	sp34	
ma-la-do-ro-pv-ph-ad	Arecaceae	Areca	pumida	
pl-co-do-ro-pv-ch-ad	Arecaceae	Plectocomia	ciliata	
pl-co-do-ro-pv-ph-ad	Arecaceae		sp16	'Nge nge'
ma-ve-do-fi-hc-ad-ep	Aspleniaceae	Asplenium	nidus	
mi-la-do-hc-li-ad	Asteraceae	Mikania	micrantha	
pl-la-do-su-hc-ad	Begoniaceae	Begonia	robusta	
pl-la-do-su-hc-ad	Commelinaceae		sp28	
pl-la-do-su-pv-hc-ad	Costus	Costus	speciosus	
no-co-do-hc-li	Cucurbitaceae	Trichosanthes	sp51	
le-la-do-ro-fi-ph-ad	Cyatheaceae	Cyathea	pubescens?	
me-la-do-ch-li-ad-ep	Ericaceae	Vaccinium	sp18	
me-la-do-ph	Euphorbiaceae	Antidesma	moluccanum	
mi-la-do-ct-ph	Euphorbiaceae	Glochidion	borneensis?	
ma-la-do-ch	Euphorbiaceae	Macaranga	triloba	

PFT	Family	Genus	Species	Local name
me-co-do-hc-ad	Hypoxidaceae	Curculigo	orchioides	
me-la-do-ct-ph	Icacinaceae	Platea	macrophylla	
pl-co-do-ph	Lauraceae	Litsea	impressa	
ma-la-do-hc-ad	Marantaceae	Phrynium	parviflorum	
no-la-do-ch-li	Melastomataceae	Miconia?	sp24	
me-ve-do-de-ct-ph	Moraceae	Ficus	sp17	
pl-la-do-de-ct-ph	Moraceae	Ficus	sp46	
mg-co-do-ro-su-pv-hc-ad	Musaceae	Musa	acuminata	
me-la-do-ch	Myrtaceae	Eugenia	sp04	
ma-co-do-ro-su-pv-hc-ad-ep	Orchidaceae	Phaius	indigoferus?	Fern
me-co-do-ro-pv-ch-li-ad	Pandanaceae	Freycinetia	sp39	
no-co-do-pv-ph-ad	Poaceae	Schizostachyum	zollingeri	
mi-la-do-fi-hc-li-ad-ep	Polypodiaceae	Phymatosorus	sp42	
me-la-do-ch-li-ad	Rosaceae	Rubus	moluccanus	
no-la-do-ch-li-ad-ep	Rubiaceae	Mussaenda	frondosa	
no-la-do-ct-ph	Rubiaceae	Psychotria?	sp38	
me-co-do-ch-li	Rubiaceae	Uncaria	glabrata?	
me-la-do-ct-ph	Rubiaceae	Urophyllum	glabrum	
me-pe-do-ch-li-ad-ep	Smilacaceae	Smilax	sp19	
no-la-do-ch	Symplocaceae	Symplocos	sp44	
me-co-do-hc-li-ad-ep	Urticaceae	Poikilospermum	suaveolens	
mg-la-do-su-pv-hc-ad	Zingiberaceae	Amom	coccineum	
mg-la-do-su-hc-ad	Zingiberaceae	Amomum	megalocheilos	
ma-la-do-su-pv-hc-ad	Zingiberaceae	Globba	sp35	
no-la-do-hc			sp13	'Ja jaruman'
le-la-do-fi-hc-ad-ep			sp14	Fern
na-la-do-fi-hc-ad			sp27	Fern
no-la-do-hc-li-ad-ep			sp29	'Ki rapet'
le-la-do-fi-hc-ad-ep			sp33	Fern
no-la-do-fi-hc-ad			sp36	Fern
me-la-do-su-hc-ad			sp37	'Anjueng'
me-la-do-fi-hc-li-ad-ep			sp45	Fern

Gunung Halimun 04

PFT	Family	Genus	Species	Local name
no-la-do-hc	Acanthaceae		sp57	
me-la-do-ch	Actinidiaceae	Saurauia	sp63	
no-la-do-ro-pv-ch	Agavaceae	Cordyline	fruticosa	
me-la-do-ch	Annonaceae	Oxymitra	cuneiformis	
pl-la-do-su-pv-hc-ad	Araceae	Homalomena	sp21	
me-la-do-ct-ph	Araliaceae	Schefflera	longifolia?	
me-la-do-ch	Araliaceae	Schefflera	sp24	
ma-la-do-ro-pv-ph-ad	Arecaceae	Apama	tomentosa	
no-la-do-ch-li-ad	Arecaceae	Calamus	sp30	
ma-co-do-ro-pv-ch-li-ad	Arecaceae	Plectocomia	elongata	
na-la-do-su-hc-li-ad-ep	Asclepiadaceae	Dischidia	sp03	
mg-ve-do-pv-fi-hc-ad-ep	Aspleniaceae	Asplenium	nidus	
pl-la-do-fi-ph-ad	Aspleniaceae	Asplenium	sp66	

PFT	Family	Genus	Species	Local name
le-la-do-ro-ph-ad	Cyatheaceae	Cyathea	pubescens	
no-co-do-pv-hc-ad	Cyperaceae	Scleria	sp40	
mi-la-do-fi-hc-ad-ep	Davalliaceae	Nephrolepis	hirsutula?	
no-la-do-ct-ph	Euphorbiaceae	Glochidion	sp12	
pl-la-do-ct-ph	Euphorbiaceae	Macaranga	triloba	
le-la-do-ch	Euphorbiaceae	Phyllanthus	sp41	
me-la-do-ph-ad	Fagaceae	Quercus	sondaica	
ma-co-do-ro-pv-hc-ad	Hypoxidaceae	Curculigo	orchioides	
no-la-do-ch	Icacinaceae	Gonocaryum - cf	sp22	
me-la-do-ch	Icacinaceae		sp44	
no-la-do-ch-ad	Melastomataceae	Clidemia	hirta	
no-la-do-ch	Melastomataceae	Pternandra	galeata	
no-la-do-ch-li	Melastomataceae		sp61	
no-la-do-hc-li-ad-ep	Menispermaceae	Percampylus	sp18	
mi-pe-do-hc-li-ad-ep	Moraceae	Ficus	sp32	
mi-la-do-de-ch-li	Moraceae	Ficus	subulata	
no-la-do-ch	Moraceae		sp58	
mg-co-do-ro-su-pv-hc-ad	Musaceae	Musa	acuminata	
no-la-do-ch	Myrsinaceae	Ardisia	sp31	
no-la-do-hc-li-ad-ep	Myrsinaceae		sp33	
me-la-do-ph	Myrtaceae	Eugenia	cuprea	
no-la-do-ch	Myrtaceae	Eugenia	subglauca	
no-la-do-ch	Myrtaceae	Syzygium	polyanthum	
mi-la-do-ch	Myrtaceae	Syzygium	sp36	
ma-la-do-su-hc-ad	Orchidaceae	Phaius	indigoferus	
mi-la-do-so-su-hc-ad-ep	Orchidaceae		sp13	
no-la-do-ro-pv-ch-li-ad-ep	Pandanaceae	Freycinetia	sp28	
no-co-do-pv-ch-li-ad-ep	Pandanaceae	Freycinetia	sp51	
mg-co-do-ro-pv-ch-ad	Pandanaceae	Pandanus	sp02	
no-la-do-hc-li-ad-ep	Piperaceae	Piper	sp37	
no-la-do-hc-li-ad-ep	Piperaceae	Piper	sp42	
no-la-do-pv-hc-ad	Poaceae	Leptaspis?	sp62	
me-la-do-ct-ph	Rosaceae	Prunus	grisea	
no-la-do-hc-li-ad	Rubiaceae	Mussaenda	frondosa?	
no-la-do-ct-ph	Rubiaceae	Psychotria?	sp04	
me-la-do-ch	Rubiaceae	Psychotria?	sp59	
mi-la-do-hc	Rubiaceae		sp54	
no-la-do-ph	Rutaceae	Evodia	latifolia	
pi-la-do-fi-hc-ad	Selaginellaceae	Selaginella	sp23	
me-la-do-ch-li-ad-ep	Smilacaceae	Smilax	zeylanica-cf	
mi-la-do-ph	Theaceae	Eurya	acuminata	
me-la-do-su-hc-li-ad-ep	Urticaceae?		sp15	'Ki lampahan'
me-la-do-ct-ph	Violaceae	Rinorea	sp10	'Kokosan'
no-la-do-hc-li-ad-ep	Vitaceae	Cayratia	sp14	
me-la-do-hc-li-ad-ep	Vitaceae	Cayratia	sp60	
na-la-do-fi-hc-li-ad-ep			sp07	Fern
me-pe-do-hc-li-ad			sp19	'Ki bulu'
no-la-do-ph			sp34	'Ki bang bara'
le-la-do-fi-hc-ad			sp45	Fern

PFT	Family	Genus	Species	Local name
me-la-do-ch			sp46	'Le umchang'
no-la-do-ch			sp47	'Ki serung'
le-la-do-fi-hc-ad			sp50	Fern
nc-la-do-fi-hc-li-ad-ep			sp53	Fern

Gunung Halimun 05

PFT	Family	Genus	Species	Local name
no-la-do-ch	Actinidiaceae	Saurauia	pendula	
no-la-do-ct-ph	Altingiaceae	Altingia	excelsa	
me-la-do-ct-ph	Annonaceae	Goniothalamus	sp58	
ma-la-do-su-hc-ad	Araceae	Alocasia	sp47	
ma-la-do-su-pv-hc-ad	Araceae	Homalomena	caudata?	
me-la-do-hc-li-ad-ep	Araceae	Pothos?	sp04	
ma-la-do-su-hc-li-ad-ep	Araceae	Rhaphidophora?	sp49	
me-la-do-su-hc-ad	Araceae		sp62	palmate aroid
me-la-do-ro-pv-ph-ad	Arecaceae	Areca	catechu	
ma-la-do-ro-pv-ph-ad	Arecaceae	Areca	pumida	
me-la-do-ro-pv-ch-li-ad	Arecaceae	Calamus	sp33	
pl-la-do-ro-pv-ph-ad	Arecaceae	Caryota	mitis	
ma-la-do-ro-pv-ch-ad	Arecaceae	Plectocomia	elongata	
no-la-do-ro-pv-ph-ad	Arecaceae		sp02	'Nge nge'
no-la-do-su-pv-hc-ad	Costaceae	Costus	speciosus	
le-la-do-fi-ph-ad	Cyatheaceae	Cyathea	pubescens-cf	
no-pe-do-de-cr-li	Dioscoreaceae	Dioscorea	sp45	
mi-la-do-ph	Elaeocarpaceae	Elaeocarpus	sp52	
no-la-do-ch	Euphorbiaceae	Antidesma	bunius	
ma-la-do-ct-ph	Euphorbiaceae	Macaranga	triloba	
me-co-do-ct-ph	Icacinaceae	Platea	excelsa	
no-la-do-ct-ph	Lauraceae	Cinnamomum	sintoc	
ma-co-do-su-hc-ad	Liliaceae?		sp46	
no-la-do-ph	Melastomataceae	Pternandra	galeata	
no-la-do-ct-ph	Melastomataceae	Pternandra	galeata	
mi-la-do-hc-li-ad-ep	Melastomataceae		sp12	
me-la-do-ch-li-ad	Melastomataceae		sp20	
me-la-do-ct-ph	Melastomataceae		sp25	
ma-la-do-ct-ph	Moraceae	Artocarpus	elasticus	
pl-la-do-de-ph	Moraceae	Ficua	fistulosa	
na-la-do-hc-li-ad-ep	Moraceae	Ficus	sp11	
me-la-do-de-ct-ph	Moraceae	Ficus	subulata	
me-la-do-ph	Myristicaceae	Knema	glauca	
mi-la-do-ch	Myrtaceae	Eugenia	cuprea	
no-la-do-ph	Myrtaceae	Eugenia	cuprea	
me-la-do-ct-ph	Myrtaceae	Eugenia	sp08	
no-la-do-ph	Myrtaceae	Eugenia	subglauca	
me-la-do-ch	Ochnaceae?		sp30	
ma-la-do-so-su-hc-li-ad-ep	Orchidaceae	Bulbophyllum	sp61	
mi-la-do-so-su-hc-ad-ep	Orchidaceae		sp15	
mi-la-do-so-su-hc-ad	Orchidaceae		sp18	

PFT	Family	Genus	Species	Local name
mi-la-do-so-su-hc-ad	Orchidaceae		sp57	
no-la-do-pv-ch-li-ad-ep	Pandanaceae	Freycinetia	sp40	
no-la-do-pv-ch-li-ad-ep	Pandanaceae	Freycinetia	sp42	
ma-la-do-su-ch-ad	Pandanaceae	Freycinetia	sp50	
mg-co-do-ph-ad	Pandanaceae	Pandanus	furcatus	
mg-la-do-ro-pv-ch	Pandanaceae	Pandanus	furcatus?	
ma-co-do-ct-ro-pv-ph	Pandanaceae	Pandanus	sp55	
mi-la-do-hc-li-ad-ep	Piperaceae	Piper	sp05	
me-ve-do-hc-li-ad-ep	Piperaceae	Piper	sp34	
no-la-do-hc-li-ad-ep	Polygonaceae?		sp64	'Carulang'
pl-la-do-fi-hc-ad-ep	Polypodiaceae	Drynaria	sparsisora?	
mi-la-do-hc-li-ad-ep	Rubiaceae	Morinda-cf	sp09	
no-la-do-ch-li	Rubiaceae	Mussaenda	frondosa?	
me-la-do-ch	Rubiaceae	Urophyllum	glabratum	
no-la-do-ch	Rutaceae		sp14	
me-la-do-ch	Sapindaceae	Erioglossum	rubiginosum	
le-la-do-fi-hc-ad	Selaginellaceae	Selaginella	sp29	
pl-la-do-de-ct-ph	Sterculiaceae	Sterculia	coccinea	
no-la-do-ch	Symplocaceae	Symplocos	sp10	
no-la-do-hc-li-ad-ep	Vitaceae	Cayratia	sp53	
me-la-do-su-pv-hc-ad	Zingiberaceae		sp39	'Ela'
na-la-do-fi-hc-ad			sp28	Fern
na-la-do-fi-hc-ad			sp32	Fern
le-la-do-fi-hc-ad			sp54	Fern
mi-la-do-ch			sp56	'Cingkabulu'

Gunung Halimun 06

PFT	Family	Genus	Species	Local name
no-la-do-hc-li	Apocynaceae	Alyxia	reinwardtii	
me-la-do-su-hc-ad	Araceae	Aglaonema	costatum cf.	
me-la-do-su-hc-ad	Araceae	Epipremnum *cf.*	sp16	
me-pe-do-su-hc-li-ad-ep	Araceae	Pothos cf.	sp06	
ma-la-do-su-hc-li-ad-ep	Araceae	Rhphidophora *cf.*	sp39	
pl-la-do-ro-pv-ch-ad	Arecaceae	Calamus	sp04	
no-la-do-pv-ch-li-ad	Arecaceae	Calamus	sp14	
ma-la-do-ro-pv-ch-ad	Arecaceae	Licuala	spinosa cf.	
me-la-do-pv-ch-ad	Arecaceae	Plectocomia	elongata	
mg-co-do-fi-hc-ad-ep	Aspleniaceae	Asplenium	nidus	
pl-la-do-fi-hc-ad	Aspleniaceae	Asplenium	sp33	
no-la-do-ch	Clusiaceae	Garcinia	sp08	
me-la-do-ph	Cornaceae	Nyssa	javanica	
le-la-do-ro-fi-ph-ad	Cyatheaceae	Cyathea	pubescens *cf.*	
no-pe-do-de-cr-li	Dioscoreaceae	Dioscorea	sp21	
no-la-do-hc-ad-ep	Ericaceae	Vaccinium	sp49	
me-la-do-ch-li	Euphorbiaceae cf.		sp29	'Kupu kupu'
no-co-do-ph	Fagaceae	Castanopsis	acuminatissima	
me-ve-do-ph	Fagaceae	Lithocarpus	indica	
no-la-do-ph	Fagaceae	Quercus	gemelliflora	

PFT	Family	Genus	Species	Local name
me-co-do-ph	Fagaceae	Quercus	sondaica	
pl-la-do-ch	Lauraceae	Litsea	impressa	
no-la-do-ch	Lauraceae	Litsea	sp07	
no-la-do-ch-ad	Leeaceae	Leea	sp40	
no-la-do-fi-hc-ad	Marattiaceae	Marattia	asiatica	
no-la-do-ch-li	Moraceae	Ficus	subulata	
me-la-do-ct-ph	Myristicaceae *aff.*		sp42	
no-co-do-ph	Myrtaceae	Eugenia	excelsa	
mi-la-do-ch	Myrtaceae	Eugenia	sp17	
mi-la-do-pv-hc-ad	Orchidaceae	Malaxis	sp44	
me-ve-do-so-su-pv-hc-ad	Orchidaceae		sp26	
no-la-do-pv-hc-ad	Orchidaceae		sp41	
me-co-do-so-su-hc-ad-ep	Orchidaceae		sp48	
no-la-do-so-su-hc-ad	Orchidaceae		sp51	
no-pe-do-su-ch-li-ad-ep	Pandanaceae	Freycinetia	sp05	
mg-la-do-ro-pv-ch-ad	Pandanaceae	Pandanus	sp16	
me-la-do-ch	Piperaceae	Piper	sp45	
no-la-do-fi-hc-ad-ep	Polypodiaceae	Drynaria	sp47	
no-la-do-ct-ph	Rubiaceae	Urophyllum	glabrum cf	
le-la-do-fi-hc-ad	Selaginellaceae	Selaginella	sp50	
me-la-do-ch-li	Smilacaceae	Smilax	sp37	
no-la-do-fi-hc-ad	Tectariaceae	Tectaria	sp13	
no-la-do-ct-ph	Theaceae	Schima	wallichii	
me-la-do-ch	Tiliaceae	Pentara	polyantha	
me-la-do-su-hc-ad	Zingiberaceae		sp35	
mi-la-do-fi-hc-ad			sp10	Fern
me-la-do-fi-hc-ad			sp11	Fern
no-la-do-ch			sp19	'Ki melati'
me-la-do-ch			sp20	'Ki bulu'
le-la-do-fi-hc-li-ad-ep			sp38	Fern
no-la-do-ch-li			sp46	'Arae tatankilan'

Gunung Halimun 07

PFT	Family	Genus	Species	Local name
mi-la-do-hc-li-ad	Apocynaceae		sp31	
pl-pe-do-su-hc-li-ad-ep	Araceae	Epipremnum cf.	sp15	
no-pe-do-su-pv-hc-li-ad-ep	Araceae	Pothos	sp37	
ma-la-do-su-hc-ad	Araceae		sp47	
me-la-do-ch	Araliaceae	Schefflera	sp50	
ma-la-do-ro-pv-ph-ad	Arecaceae	Areca	pumida	
ma-la-do-ro-pv-ch-ad	Arecaceae	Daemonorops	sp06	
ma-la-do-ro-pv-ch-ad	Arecaceae	Licuala	spinosa cf.	
ma-ve-do-ro-pv-hc-ad-ep	Aspleniaceae	Asplenium	nidus	
no-la-do-ch	Chloranthaceae cf.	Chloranthus cf.	sp13	
le-la-do-ro-fi-ph-ad	Cyatheaceae	Cyathea	pubescens	
mi-la-do-fi-hc-ad-ep	Davalliaceae	Nephrolepis	hirsutula *cf.*	
me-la-do-ct-ph	Elaeocarpaceae	Elaeocarpus	petiolatus *cf.*	
no-la-do-ch	Euphorbiaceae	Aporusa	arborea	

PFT	Family	Genus	Species	Local name
me-la-do-ph	Euphorbiaceae	Glochidion	palustre *cf.*	
no-la-do-ct-ph	Euphorbiaceae	Glochidion	sp32	
ma-la-do-ch	Euphorbiaceae	Macaranga	triloba	
no-la-do-hc-ad	Fabaceae	Derris	thyrsiflora *cf.*	
no-la-do-ch	Fagaceae	Lithocarpus	sp10	
no-la-do-ph-ad	Fagaceae	Lithocarpus	sp48	
me-co-do-ph	Fagaceae	Quercus	teysmanii	
me-la-do-ch	Lauraceae	Cinnamomun	iners	
me-la-do-ph	Lauraceae	Litsea	brachstachya	
me-la-do-ch	Lauraceae	Litsea	impressa *cf.*	
no-la-do-ch	Lauraceae	Litsea	sp28	
no-la-do-ch-ad	Leeaceae	Leea	sambucina cf.	
ma-la-do-ct-ph	Moraceae	Artocarpus	elasticus	
no-pe-do-hc-li-ad-ep	Moraceae	Ficus	sp07	
no-la-do-su-ch-li-ad-ep	Moraceae	Ficus	sp18	
me-la-do-ph	Myristicaceae	Myristica cf.	sp44	
me-la-do-ct-ph	Myrtaceae	Eugenia	sp33	
me-co-do-ph	Myrtaceae	Eugenia	subglauca	
no-la-do-ph	Myrtaceae	Rhodamnia	cinerea	
no-co-do-pv-ch-li-ad-ep	Pandanaceae	Freycinetia	sp02	
mg-co-do-pv-ch-ad	Pandanaceae	Pandanus	sp17	
mi-la-do-pv-ch-li-ad	Poaceae	Bambusa *cf.*	sp41	
no-la-do-pv-hc-ad	Poaceae	Leptaspis	sp20	
le-la-do-ph	Podocarpaceae	Dacrycarpus	imbricatus	
no-la-do-ph	Rhizophoraceae	Gynotroches	axillaris	
me-la-do-ch	Rubiaceae	Psychotria	montana *cf.*	
pi-la-do-fi-hc-ad	Selaginellaceae	Selaginella	sp27	
me-la-do-de-ph	Sterculiaceae	Sterculia	sp03	
no-la-do-ch	Symplocaceae	Symplocos	cochinchinensis *cf.*	
no-la-do-ch	Theaceae	Schima	wallichii	
me-la-do-ph	Theaceae	Schima	wallichii	
pl-la-do-su-pv-hc-ad	Zingiberaceae		sp08	'Ela'
no-pe-do-fi-ph-li-ad-ep			sp14	Fern
na-la-do-fi-hc-ad			sp30	Fern
no-la-do-ph-li-ad-ep			sp36	'Harrnang'
le-la-do-fi-hc-ad-ep			sp39	Fern
no-la-do-ph			sp42	'Madja'

Gunung Halimun 08

PFT	Family	Genus	Species	Local name
mi-la-do-ch-li	Apocynaceae	Alyxia	Reinwardtii	
mi-la-do-ch-li	Apocynaceae	Indet	sp46	
no-la-do-ro-pv-hc	Arecaceae	Areca	pumida *cf.*	
pl-la-do-ro-pv-hc	Arecaceae	Indet	sp27	
mi-pe-do-ph	Cunoniaceae	Weinmannia	blumei	
ma-la-do-fi-hc-ad	Dipteridaceae	Dipteris	conjugata	
mi-ve-do-ct-ph	Elaeocarpaceae	Elaeocarpus	petiolatus *cf.*	
me-co-do-ph	Elaeocarpaceae	Sloanea	sp15	

PFT	Family	Genus	Species	Local name
no-la-do-ch-li-ad-ep	Ericaceae	Vaccinium	sp54	
no-la-do-ch	Euphorbiaceae	Glochidion	sp12	
mi-co-do-ph	Fagaceae	Castanopsis	acuminatissima?	
le-la-do-fi-hc-li-ad	Fern	Indet	sp10	
mi-ve-do-ph	Grossulariaceae	Quintinia?	sp01	
no-la-do-ct-ph	Indet	Indet	sp13	
no-la-do-hc-li	Indet	Indet	sp20	
mi-la-do-ch	Indet	Indet	sp25	
mi-la-do-ch-li	Indet	Indet	sp34	
no-ve-do-ct-ph	Indet	Indet	sp36	
mi-co-do-ph	Indet	Indet	sp41	
no-la-do-ch	Indet	Indet	sp44	
mi-co-do-ct-ph	Indet	Indet	sp52	
mi-ve-do-su-hc-li-ad-ep	Indet	Indet	sp55	
mi-co-do-ph	Indet	Indet	sp56	
mi-co-do-ph	Juglandaceae	Engelhardia	sp43	
mi-la-do-ch	Lauraceae	Cinnamomum	iners	
mi-ve-do-ct-ph	Lauraceae	Cinnamomum	sp39	
no-co-do-ph	Lauraceae	Indet	sp04	
no-co-do-ph	Lauraceae	Indet	sp45	
mi-ve-do-ph	Myrsinaceae	Indet	sp05	
mi-la-do-ct-ph	Myrtaceae	Syzygium	sp33	
mi-la-do-ch	Olacaceae	Indet	sp53	
me-la-do-fi-hc-ad	Oleandraceae	Indet	s006	
no-ve-do-so-su-hc-ad-ep	Orchidaceae	Bulbophyllum	sp18	
me-co-do-so-su-pv-hc-ad-ep	Orchidaceae	Bulbophyllum	sp31	
me-co-do-so-su-pv-hc-ad-ep	Orchidaceae	Coelogyne	sp49	
mi-ve-do-so-su-hc-ad-ep	Orchidaceae	Indet	sp07	
mi-co-do-so-su-hc-ad-ep	Orchidaceae	Indet	sp08	
mi-pe-do-so-su-pv-hc-ad-ep	Orchidaceae	Indet	sp23	
mi-co-do-so-su-pv-hc-ad-ep	Orchidaceae	Indet	sp50	
na-ve-do-so-su-hc-ad-ep	Orchidaceae	Indet	sp57	
no-co-do-ro-ch-li-ad-ep	Pandanaceae	Freycinetia	sp32	
le-la-do-ph	Podocarpaceae	Dacrycarpus	imbricatus	
mi-ve-do-fi-hc-ad-ep	Polypodiaceae	Pyrrosia	sp40	
me-la-do-ch	Rubiaceae	Indet	sp16	
no-la-do-ch	Rubiaceae	Indet	sp24	
no-la-do-ct-ph	Rubiaceae	Indet	sp35	
mi-la-do-ch-li	Rubiaceae	Indet	sp38	
no-la-do-ch	Rubiaceae	Lasianthus	sp28	
no-la-do-ch-li-ep	Rubiaceae	Morinda	sp30	
no-la-do-ch	Rubiaceae	Psychotria	sp09	
no-la-do-ct-ph	Rubiaceae	Timonius	sp48	
no-la-do-ch	Sapindaceae	Indet	sp42	
no-la-do-hc-li	Smilacaceae	Smilax	sp19	
mi-la-do-ch	Solanaceae	Indet	sp29	
mi-la-do-ch	Theaceae	Eurya	acuminata	
mi-la-do-ch	Thymelaeaceae	Indet	sp47	