

REPORT ON BLUEPRINT FOR KUALA LANGAT SOUTH FOREST RESERVE (KLSFR), SELANGOR



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FORESTRY DEPARTMENT PENINSULAR MALAYSIA (FDPM)
FOREST RESEARCH INSTITUTE MALAYSIA (FRIM)

2014

**PROJEK TANAMAN KAWASAN TEROSOT DAN SENSITIF KOMPT 55
HUTAN SIMPAN KUALA LANGAT SELATAN, BLOK A
DAERAH PANTAI KLANG**



Ibu Pejabat Perhutanan Semenanjung Malaysia
& Jabatan Perhutanan Negeri Selangor



Tahun	Rawatan	Jenis Rawatan	Jenis Spesis
2011	Pertama	Menyulam 5000 pokok	* Meranti Rambai Daun Merawan Siput Jantan Tenggek Burung

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Executive Summary

The main output of this study is a Blueprint for Kuala Langat South Forest Reserve (KLSFR) in Kuala Langat, Selangor. Due to limitations on time and financial resources allocated, the report was prepared based on the existing information available with limited primary data collection. However, the report encompasses the main components of the Blueprint which reflects current conditions of the KLSFR as well as possible future plans for the site. The total size of the KLSFR is about 7,390 ha, although the official figure quoted is 6,908 ha. Nonetheless, this study covers the surrounding area around the KLSFR which amounts to about 40,000 ha covering the KLSFR and other land uses. For the purpose of producing a land use map for the KLSFR and its surrounding areas, secondary inventory data and satellite data were used in this study. Peat swamp forests cover 6,007 ha of the area, while palm oil plantations cover another 25,796 ha, horticulture activities 3,115 ha, urban & residential 2,348 ha, and water bodies cover 2,465 ha of the KLSFR. Total forest stocking of trees 15 cm diameter at breast height (DBH) and above amounted to 5,915,202 m³. Aboveground carbon for peat swamp forests area (high, medium & low dense classes) within the KLSFR was estimated at 39.58 tonnes ha⁻¹ which amounted to a total of 209,943 tonnes. Several forest activities were proposed in monitoring and enhancing the functions of the KLSFR such as boundary marking, forest silviculture (enrichment planting & rehabilitation) and community forest programmes.

The study suggested some recommendations for enhancing the conservation and management of the KLSFR. Among others, the recommendations include:

- Conduct community participatory appraisal.
- Prepare Integrated Management Plan (IMP).
- Impose agro-forestry practices in leased areas.
- Increase regular patrolling and monitoring.
- Conduct study on water management.
- Allocate part of the KLSFR as a high conservation value forest (HCVF).
- Conduct proper study for quantification of total carbon stock and other environmental services.
- Establish a one-stop centre or information centre for peat swamp forest in the KLSFR.

If necessary, consultations with other relevant stakeholders, such as local people surrounding the areas might be useful to further strengthen the Blueprint by taking the views and concerns of the stakeholders. This would enable for a smooth implementation of the recommendations as well as satisfy the needs of the important stakeholders.

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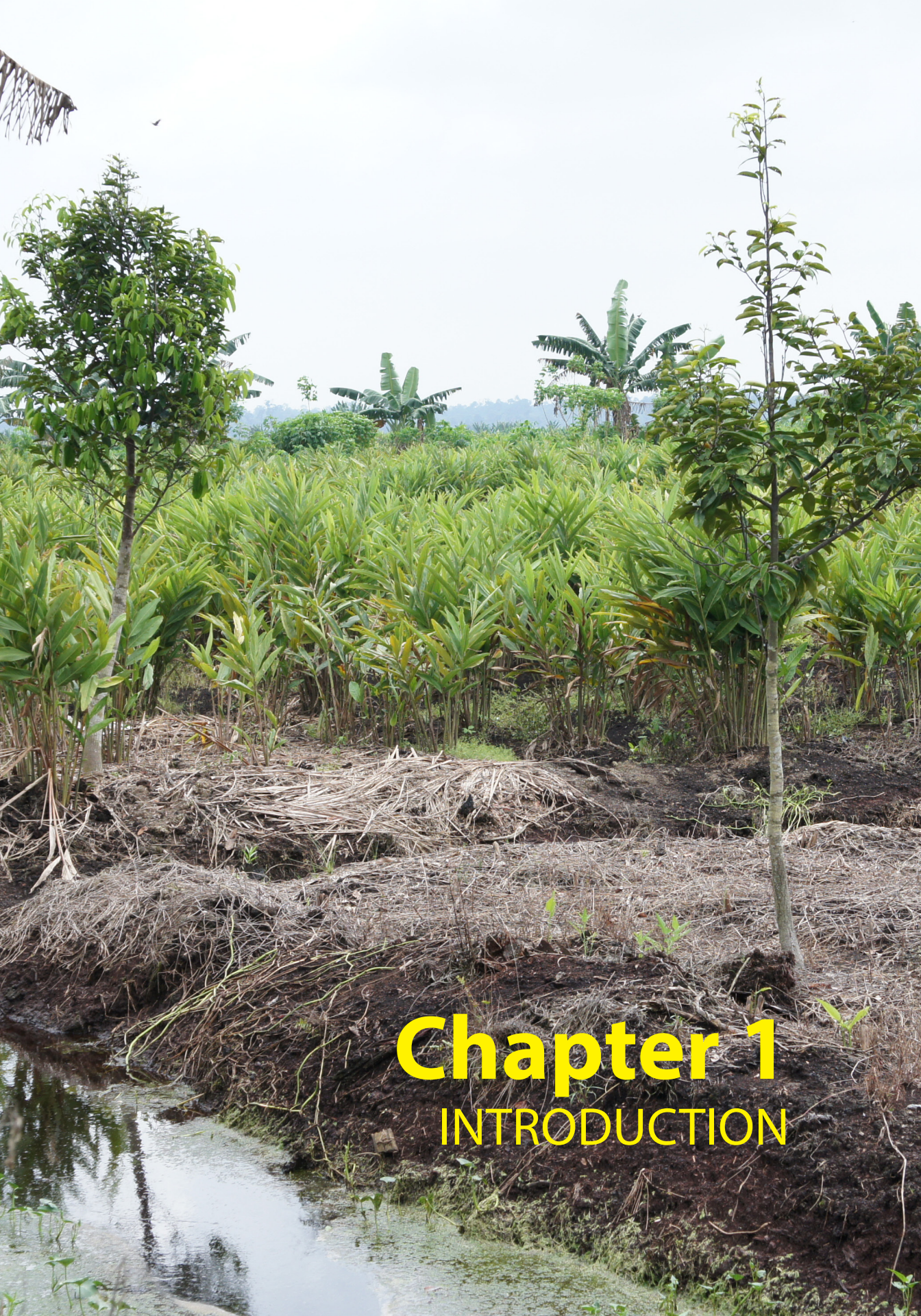
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Abbreviations

CO ₂	carbon dioxide
DBH	diameter at breast height
FR	forest reserve
ha	hectare
HCVF	high conservation value forest
IMP	integrated management plan
KLIA	Kuala Lumpur International Airport
KLSFR	Kuala Langat South Forest Reserve
m	meter
NDVI	Normalised Different Vegetation Index
PRF	permanent reserved forest
PSF	peat swamp forest
t	tonne
VJR	virgin jungle reserve





Chapter 1

INTRODUCTION

1.1 Background

Kuala Langat South Forest Reserve (KLSFR) was in the spotlight when Selangor State Agriculture Corporation (PKPS) made a proposal to acquire the whole of KLSFR (about 6,908 ha) for the establishment of oil palm plantations. Consequently, many parties voiced their concern and were against the proposal as it would result in the conversion the forest reserve and the lost of a forest ecosystem. In response to the outcry, the Chief Minister of Selangor has tasked the Forestry Department of Selangor (FD Selangor) and the Selangor Wildlife Department (PERHILITAN) to provide justification for conserving the forest reserve. As such, this blueprint is produced to outline the plan to conserve and manage the KLSFR.

In Kuala Langat there are two peat swamp forests (PSF), namely the North and South Kuala Langat FRs covering an area of 1,265 ha (Razani & Jalil 1997) and 6,908 ha (GEC 2010), respectively. Both FRs are the most important of PSF in the south of the State of Selangor. Forest reserves and natural arboreta's are intended to preserve the biological diversity and store forestry stocks for the future. There is also a virgin jungle reserve (VJR) in Compartment 26 of the KLSFR of about 174 ha.

Peat swamp forests are tropical moist forests where water-logged soils prevent dead leaves and wood from fully decomposing, which over time create thick layer of acidic peat. This forest normally located immediately next to the coastline and extends inland along the lower reach of the main river systems. It has been reported that that the PSF is a significant carbon sink for the world (Sorenson 1993). The PSF in Selangor which cover an area of about 83,000 ha are located in four forest reserves in Kuala Langat, Kuala Selangor and Sabak Bernam. Depending on their location, these PSF's serve several functions, i.e. to control climate change, to supply water to Tanjung Karang Paddy Scheme, to rehabilitate biodiversity and to produce limited source of timber (Zulkifli *et al.* 1999).

In general, the PSF provides a variety of benefits in the form of forestry and fisheries produce, energy, flood mitigation, water supply and groundwater recharge. The PSF also functions as a reservoir for water, before releasing it into other drainage areas. It also supports unique flora and fauna. In Malaysia, the

PSF constitutes a significant portion of forested area of about 1.56 million ha. More than 70% of the PSFs are found in Sarawak with less than 20% in Peninsular Malaysia, and the remainder in Sabah.

In 2010 there were 250,129 ha of permanent reserved forest (PRF) in Selangor which represent 33% of the total forest area in Selangor. The PFR comprises three main forest types, namely dry inland, peat swamp and mangroves (**Table 1**). **Figure 1** shows the forest cover of the state of Selangor and the KLSFR, the area under study.

Table 1 Forest type under PRF in Selangor for the year 2010

Forest types	Total (ha)
Dry inland	148,240.46
Peat swamp	82,890.25
Mangroves	18,998.00
Total (ha)	250,128.71

Source: Forestry Department Peninsular Malaysia (FDPM) 2011

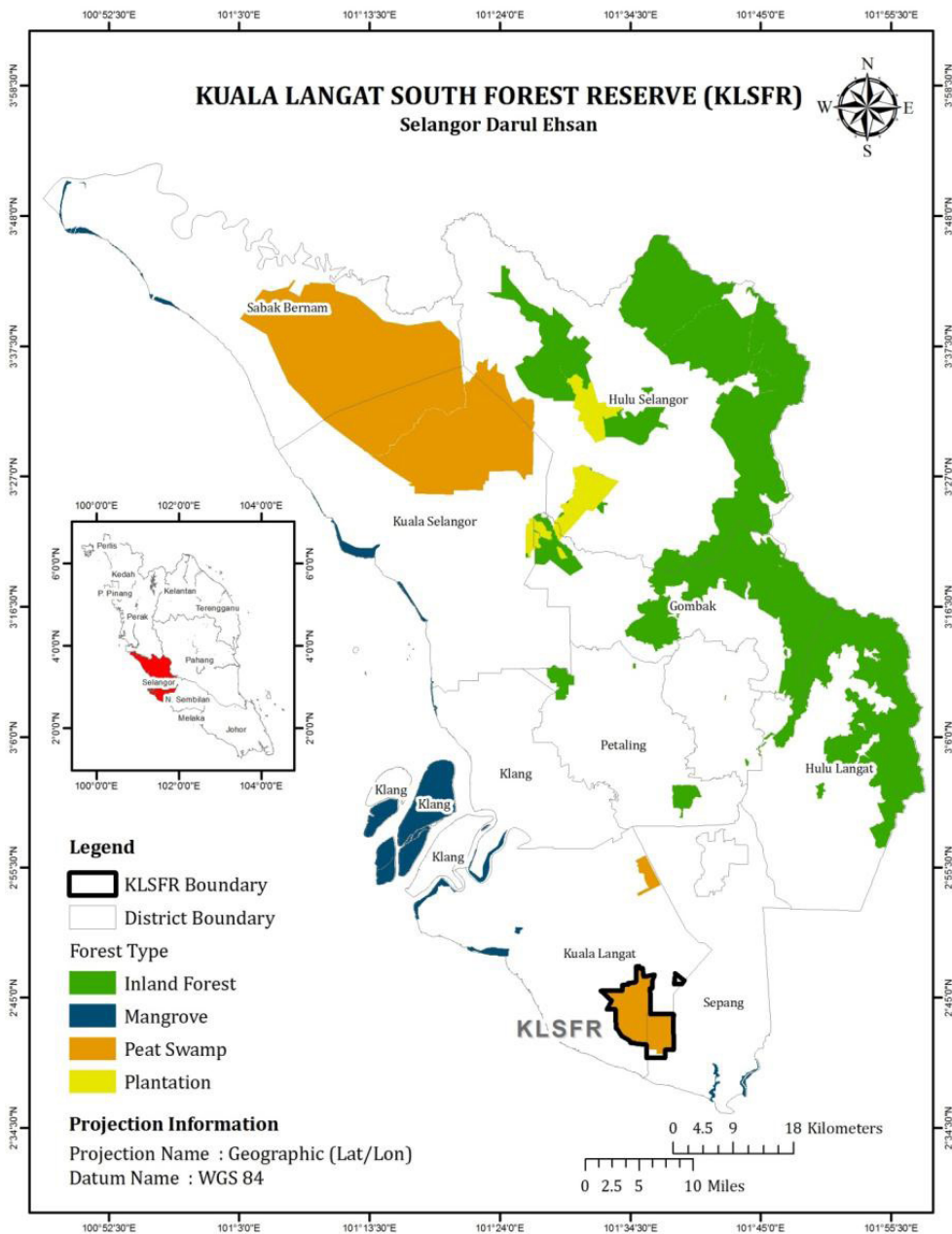


Figure 1 Forest type in the state of Selangor and the study site

The KLSFR is located close to farming areas and constantly being threatened by illegal encroachments. Planters, farmers and many others had the assumption that the KLSFR was just another wasteland and could be converted into oil palm plantation (GEC 2010). The areas surrounding the KLSFR have undergone rapid development. A significant portion of the KLSFR was developed as Kuala Lumpur International Airport (KLIA). The farmers and planters continue to slash and burn the forest illegally to grow pineapple, tapioca, ginger, corn, sweet potato, banana and to a wider scale, convert the forest into oil palm plantation.

Recent surveys revealed that the KLSFR hosts huge, towering forest stands with rare and endangered species as well as some important wildlife (FRIM 2010). The PSF is no longer in its original, pristine state but enough to warrant protection. Foresters and botanists agreed that KLSFR is worth keeping for sitting right in the middle of it, is a 174-ha VJR. These pockets of untouched forests are usually set aside within a forest reserve to serve as a genetic storehouse and seed bank for the future. The KLSFR's VJR is especially important because it is one of the last refugia of the critically endangered meranti bunga (*Shorea teysmanniana*). As the species occurs only in small numbers in several fragmented forest reserves, its future viability is uncertain and hence, the conservation importance of the remnant population in the KLSFR. Indeed, the KLSFR is deemed as the most important PSF in southern Selangor since most other such forests in the area were already lost to development. Endangered wildlife such as the sun bear, tapir and white-handed gibbon also find a home in the KLSFR.

Historically, the KLSFR was gazetted as a forest reserve on 13 May 1927 and 13 March 1940 under the provisions of the Federated Malay States Forest Enactment 1918 (F.M.S. En. 34/1918). The reserve originally was larger than its present state but had been subjected to several de-gazettements and finally reduced to 6,908 ha. The bulk of the 6,908 ha that remains is classified as a "production forest" that allows commercial harvesting. Commercial timber extraction has been carried out since 1950's, which explains the general perception that the KLSFR is a degraded forest.

The FD Selangor initiated action against the illegal encroachment into the KLSFR. Recent operations to clear crops, oil palm and the demolishment of illegal structures were clear indications that the Selangor government is seriously committed to protect the natural heritage of the state. Nonetheless, forest fire remains one of main threats to the KLSFR. A proper forest management plan is extremely necessary to manage a critical site such as this. The Blueprint is prepared to be used as an information guide on the management of the KLSFR.

1.2 Current Available Information

There are a number of references available on the KLSFR based on a comprehensive survey conducted by various parties that include PERHILITAN, FRIM, the Universiti Putra Malaysia (UPM), the Department of Environment (JAS), the Lembaga Urus Air Selangor (LUAS), the Global Environment Centre (GEC) and the Malaysian Nature Society (MNS). This survey was coordinated by the FD Selangor at the end of 2010 (JPNS 2010). Based on the report, the timber resources for this area were estimated at 100 t ha⁻¹ and the area was classified as 'Good Forest' based on the criteria used under the National Forest Inventory (NFI). The timber was valued at about RM70 millions for 1,400 ha of productive area.

The KLSFR has a 174-ha VJR located at Compartment 26 that was established in 1926. The VJR houses many important PSF tree species such as meranti bunga (*Shorea teysmanniana*), kempas (*Koompassia malaccensis*), bintangor (*Calophyllum spp.*) and geronggang (*Cratoxylum arborescens*). However, there are also large open and burnt areas occupied by mahang within the site. The presence and domination of pioneer species is an indication that forest fire occurs quite often in this area particularly at the fringes and this call for a forest rehabilitation. With regard to this, in 2010, about 602 ha had been rehabilitated with 100,000 forest trees in the open/burnt areas as well as in the encroached areas with a cost of RM500,000.00.

Fauna inventory recorded the presence of 43 species of birds, 14 species of mammals, 2 species of reptiles and 2 species of amphibians in the KLSFR. Certain threatened species under the Red List such as *ungka tangan putih*, *tapir*, *kura-kura duri bukit*, *tupai naning*, *sewah tekukur kecil* and *cenok kecil* were also recorded. Peat survey conducted showed the average depth of peat in this area is about 3.3 m (varies from 2.95 to 4.50 m depth) and as such is classified as 'Deep Peat'. In addition, the calculated carbon content for this area was about 28 million tonnes or about 4,000 t ha⁻¹ (GEC 2010).

At the southern border of this forest reserve, an orang asli Mahmeri's settlement can be found with a community of 160 people. Their livelihood and identity is heavily dependent on the forest. In addition to the orang asli, the KLSFR is partly

occupied by some 112 cash crop farmers with estimated value of crop sale at RM2 million/month.

Based on the comprehensive survey that was done, among the recommendations made to the state government are to maintain the status of this area as a forest reserve, to continue with the monitoring and rehabilitation activities, to undertake agro-forestry practices in some parts of the KLSFR, and to consider international scheme such as Reducing Emissions from Deforestation and Degradation and the role of conservation, sustainable management of forest and enhancement of forest carbon stocks (REDD+) for additional funds for rehabilitation work in the KLSFR.

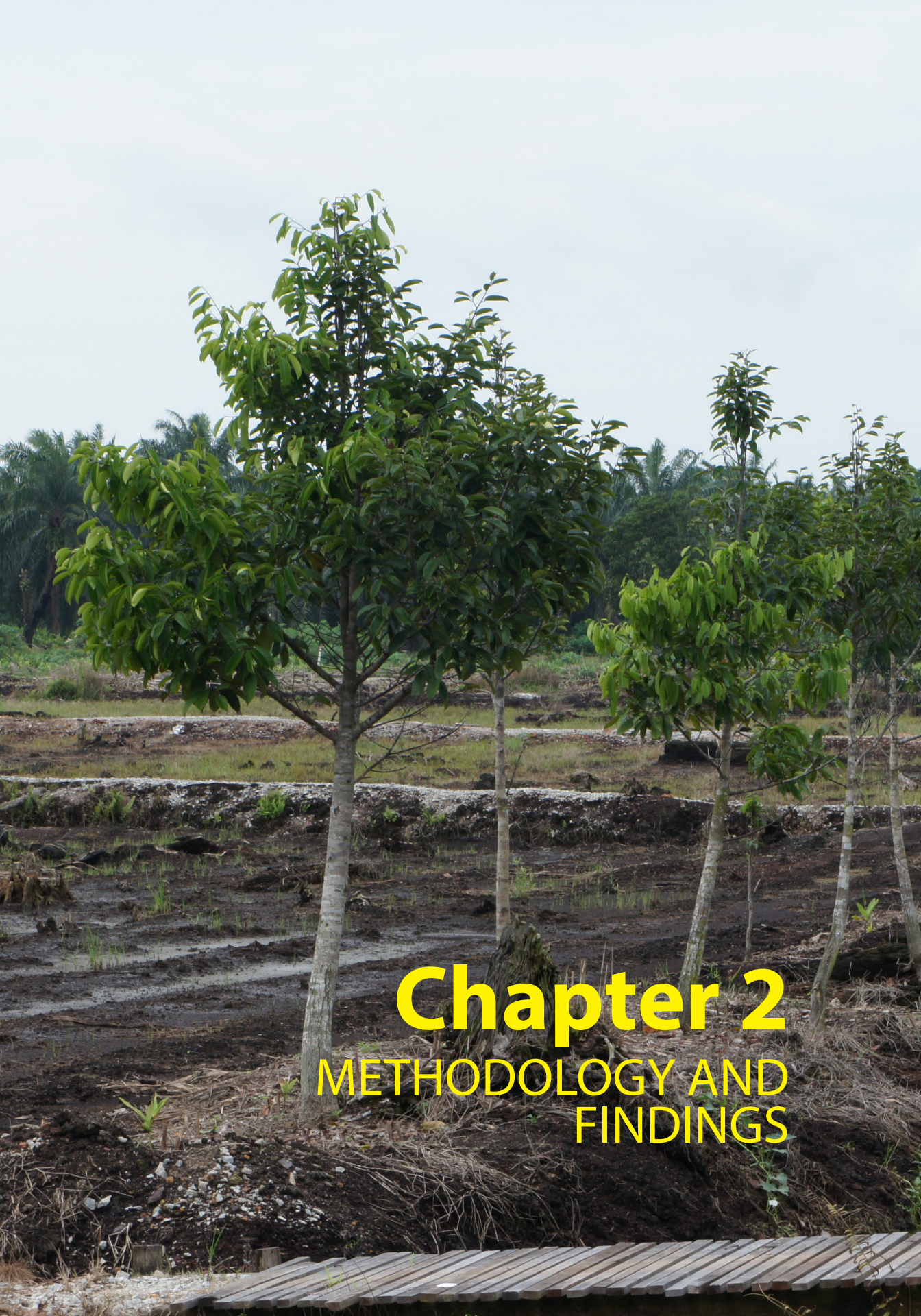
1.3 Scope of the Study

The study covers areas occupied by the KLSFR as the focal point and its surrounding areas which in total amounted to about 40,000 ha covering both the forest reserve and other land uses (20 x 20 km square). The KLSFR with latitude of 2° 45' 0 N and longitude of 101° 31' 60 E is located in the southern part of Selangor. It is situated 1,197 km west (273°) of the approximate centre of Malaysia and 50 km south (202°) of the capital Kuala Lumpur.

The scopes of this study are as follows:

- i. Classification of KLSFR and its surrounding areas of 20 x 20 km. The classification is on the forest status and the main economic activities surrounding the forest reserve;
- ii. Production of maps on KLSFR and its surroundings;
- iii. Propose forest activities to be conducted in KLSFR; and
- iv. Recommendations for future enhancement of KLSFR.





Chapter 2

METHODOLOGY AND FINDINGS

2.1 Data Types

For the purpose of producing land use map for the KLSFR and its surrounding areas, two types of data were used in this study; secondary and satellite data. The secondary data comprised external forest reserve boundaries and compartment boundaries, which were all acquired from the FD Selangor. The satellite data selected for this study consisted of SPOT-5 and SPOT-4 imageries recorded in 2008 and 2010. Properties of the data are shown in **Table 2**. A standard colour composite map shows the study area (20 x 20 km) with the KLSFR in the middle of the figure.

Table 2 Properties of satellite data used in the study

Year	Satellite	Date of image	Spatial resolution (m)
2008	Spot-4	9 February 2008	5
2010	Spot-4	22 Mac 2010	5
2010	Spot-5	3 May 2010	5

The project area selected for this study is the KLSFR and its surrounding areas with a total extent of 40,000 ha (including the PSF area), located at coordinates 101.589 N and 2.739 E. The images after pre-processing are depicted in the **Figure 2**. This image is a mosaic of three SPOT scenes that have been selected to minimise cloud cover.

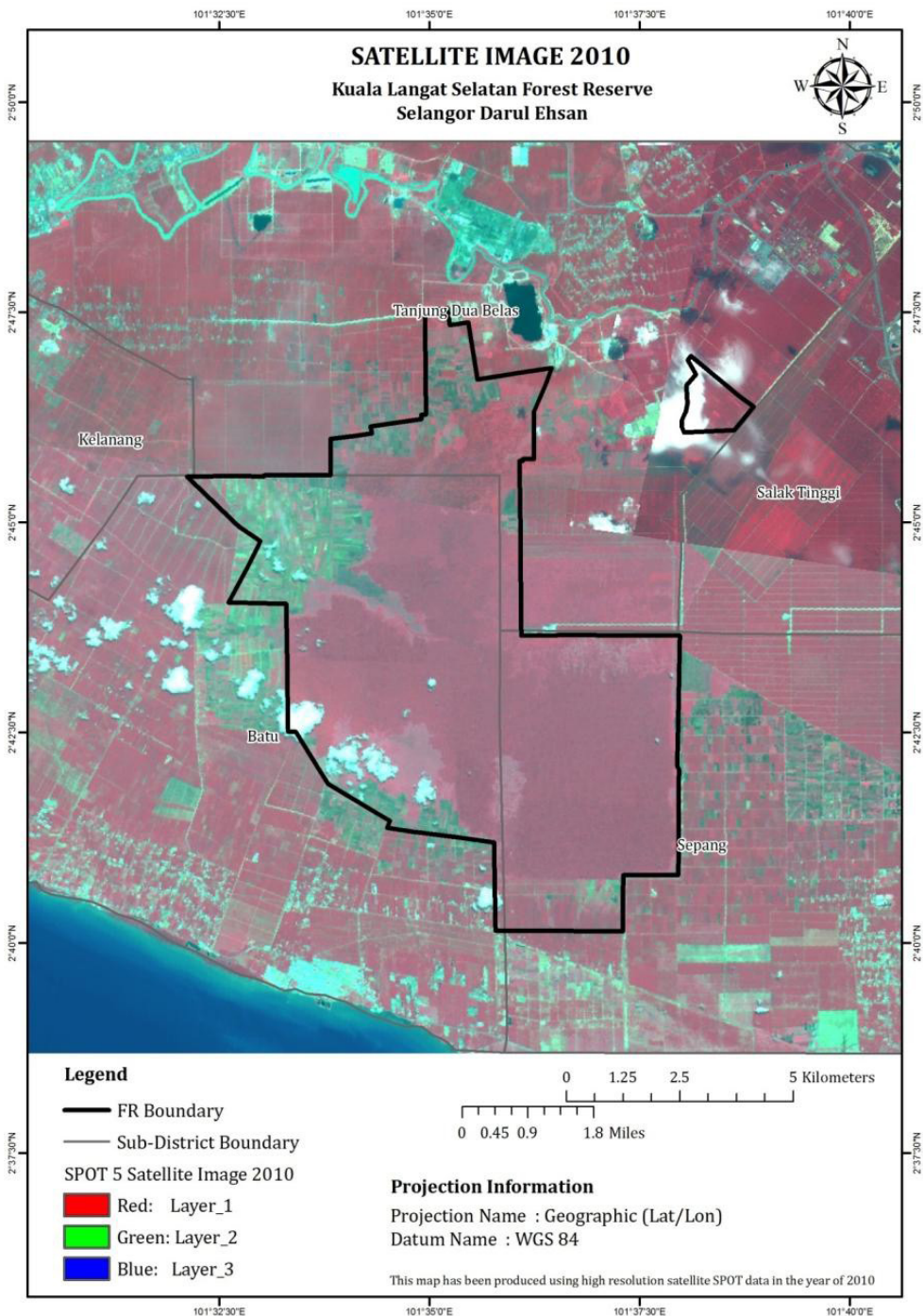


Figure 2 SPOT satellite image of study area

2.2 Ground Truth Activities

The term “ground truth” used in this study refers to “what is actually on the ground that needs to be correlated with the corresponding features or land use in the satellite imagery”. The ultimately purpose of conducting ground truth is to obtain relevant data and information as inputs and reference to enable interpretation of the SPOT satellite images. The distribution of ground truth points in the study area is shown in **Figure 3. Plates 1 – 7** show photographs of some land use activities that were observed during the ground truthing activities.

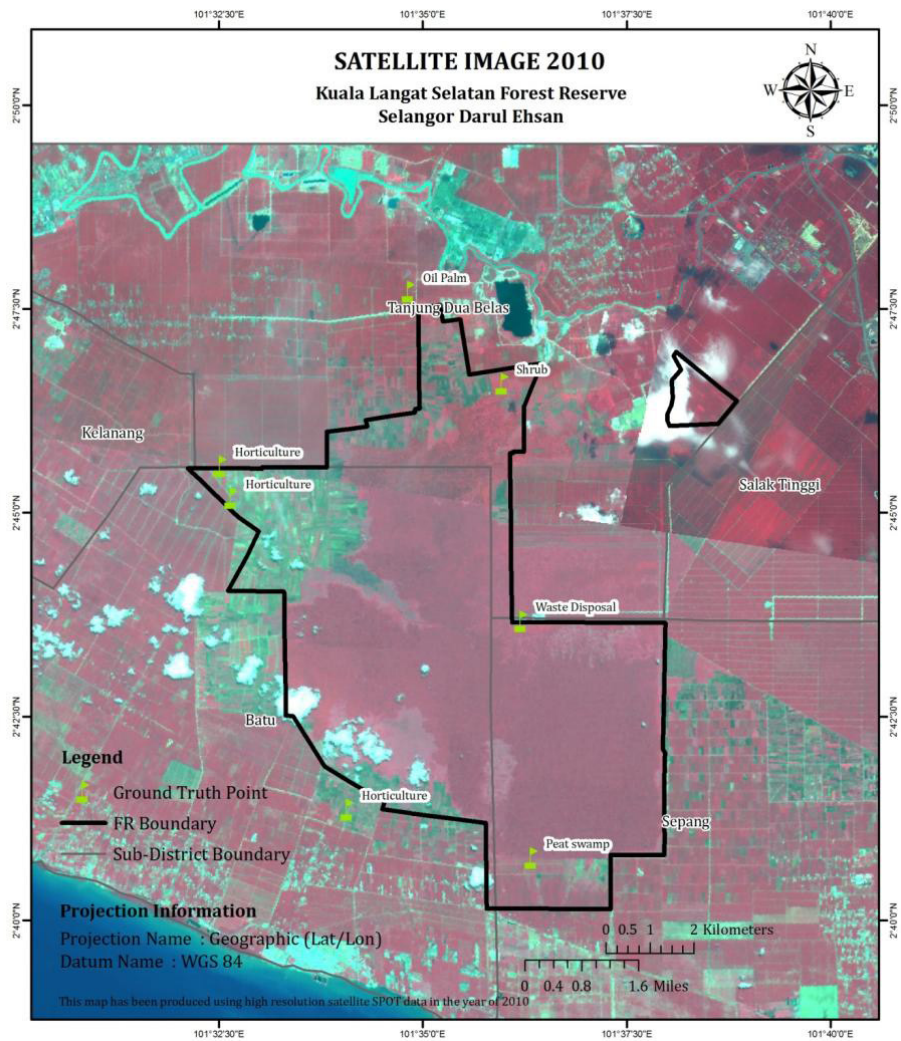


Figure 3 Distribution of ground truth points at the KLSFR and its surrounding area



Plate 1 PSF within the study site



Plate 2 Oil palm plantation within the study site



Plate 3 Shrub areas within the study site



Plate 4 Open area with farming activities within the study site



Plate 5 Ginger farm within the study site



Plate 6 Waste treatment plant near the border of the KLSFR



Plate 7 Cassava farm within the study site



Plate 8 Existing rehabilitation site at Compartment 55 (note: parts of the areas were destroyed due to recent forest fires)

2.3 Land Use Classification

To determine the extent of land use in the area, a land use classification was applied to the satellite images using an appropriate classification algorithm. Eight (8) major land use classes were identified namely; Horticulture, Mangrove forest, Oil palm, PSF, Shrub, Bare land, Urban & residential, and Water body and the extent of each land use category was quantified (**Table 3**). These classes were determined based on the discriminating capability of the SPOT satellite data. In addition to the different land use classes, the PSF itself was classified into three (3) categories according to its density based on the Normalised Difference Vegetation Index (NDVI) values. The categories were high dense, medium dense and low dense. This categorisation was made to reflect the stocking and recovery status of the PSF ecosystem due to logging activities that took place in early 1990 to 2000 in the KLSFR. The classification results were spatially mapped as shown in **Figure 4**.

Table 3 Statistics of land use classes in the study area

No.	Land use class	KLSFR (ha)	State land (ha)	Total (ha)
1	Peat swamp forest			
	- High dense	68.74	19.18	87.92
	- Medium dense	4,888.91	613.97	5,502.88
	- Low dense	346.65	69.38	416.03
	Total peat swamp forest	5,304.30	702.53	6,006.83
2	Oil palm	605.73	25,190.30	25,796.03
3	Horticulture	1,435.53	1,679.56	3,115.09
4	Shrub	44.3	80.38	124.68
5	Urban & residential	0	2,347.84	2,347.84
6	Bare land	0	253.36	253.36
7	Mangrove forest	0	72.19	72.19
8	Water body	0	2,464.80	2,464.80
	Grand Total	7,389.86	32,790.96	40,180.82

The land use classification indicated that the study area is dominated by oil palm plantation with a total extent of 25,796 ha or about 64% of the study area. Most of the plantation is located around the KLSFR boundary; however, some 606 ha appear to be within the KLSFR. The establishment of oil palm plantations within the KLSFR is a long standing issue and is yet to be resolved by the state government. Another land use that occupies large extent of the KLSFR is the PSF that covers 15% of the study area. The PSF covers some 6,007 ha and is grouped under three categories. Eighty-eight (88) ha (1.5%) is classified as high dense forest, 5,503 ha (92%) as medium dense, and the remaining forest of about 416 ha (7%) as low dense forest (**Figure 5**).

Other than the oil palm plantation and the PSF, horticulture is another major land use with a total extent of 3,115 ha. About 1,436 ha (46%) of the horticulture area are within the KLSFR. The five remaining land use classes are Water Body, Urban & residential, Shrubs, Bare land and Mangrove forest at 2,465 ha, 2,348 ha, 125 ha, 253 ha and 72 ha, respectively. The statistics of the results is shown graphically in **Figures 6 and 7**.

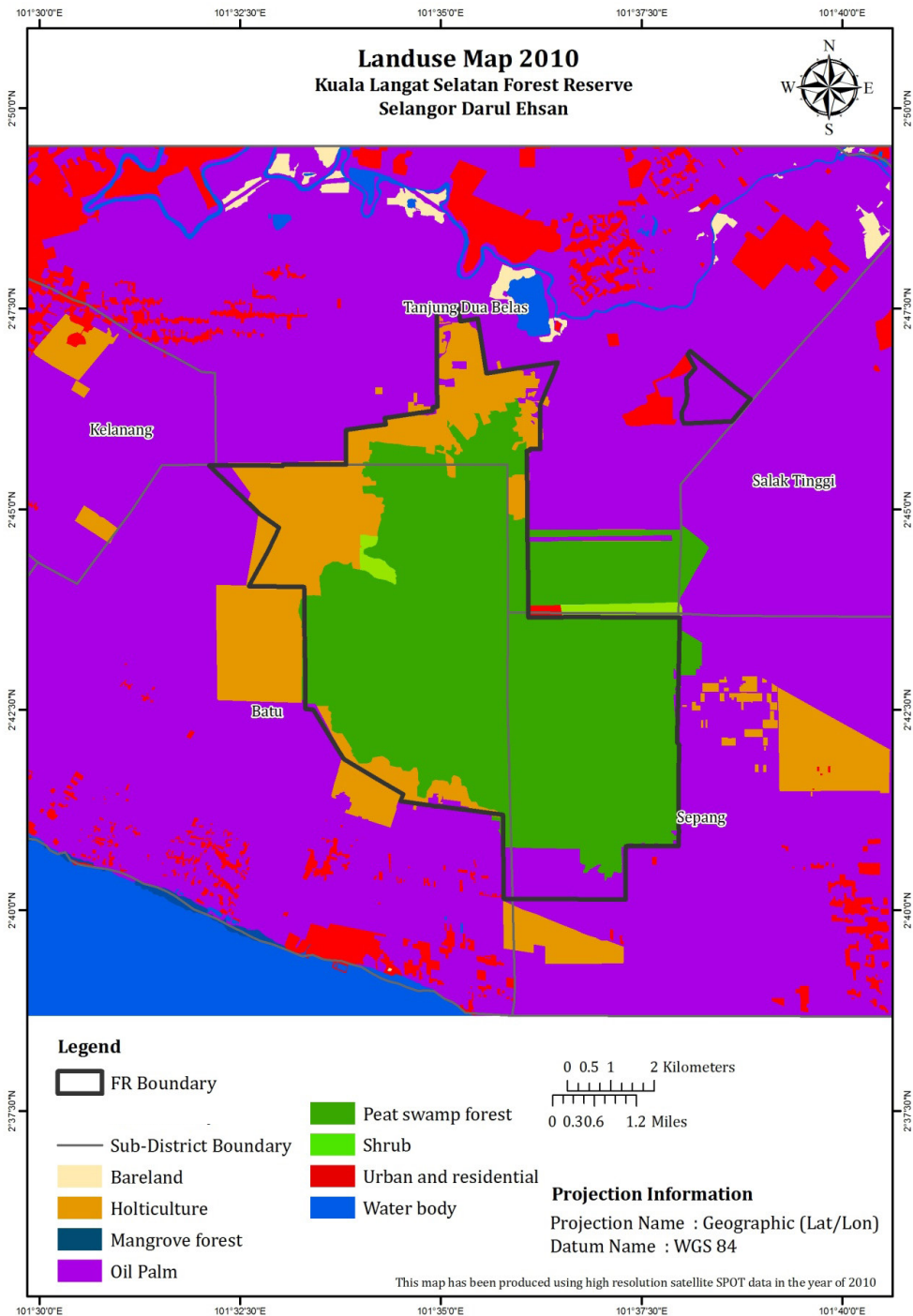


Figure 4 Land use classification using SPOT data in the study area

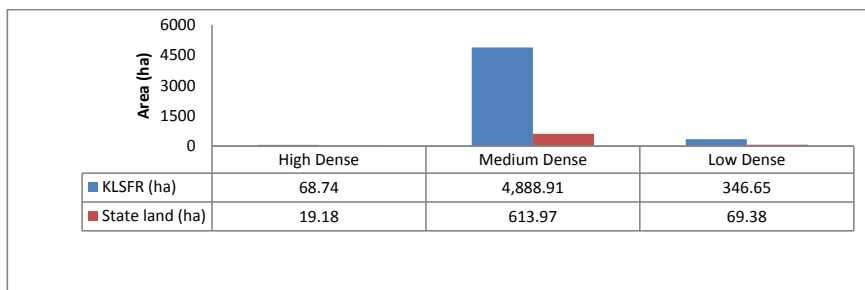
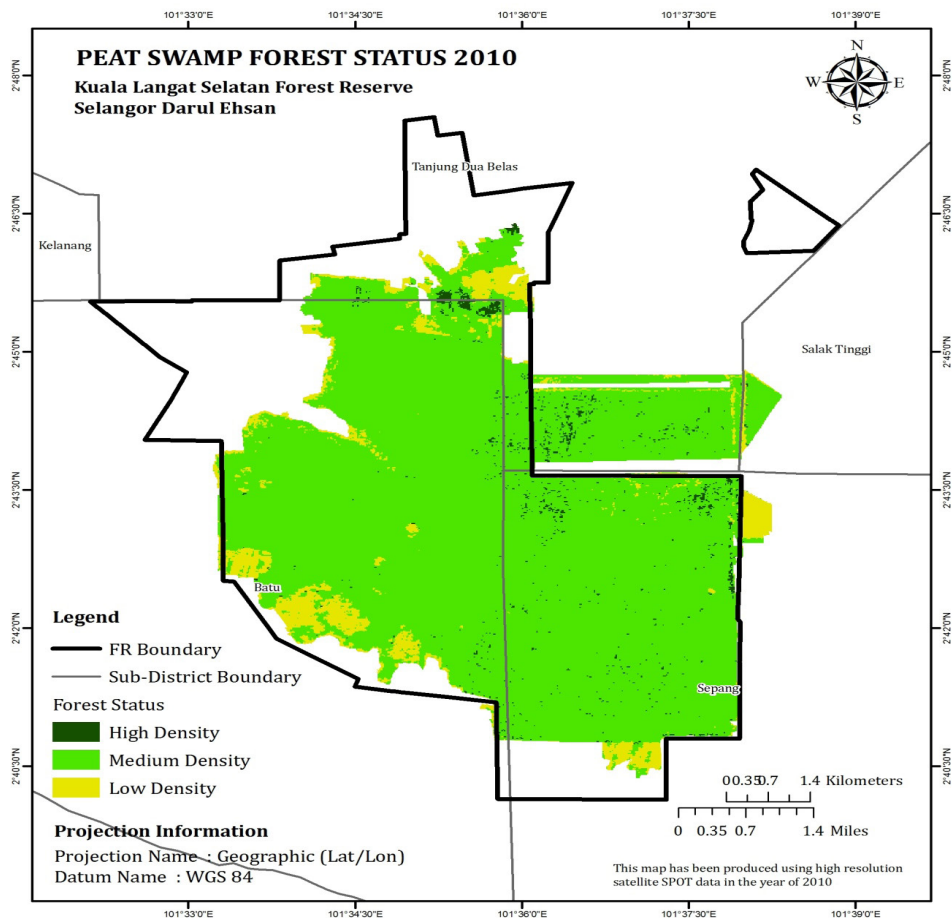
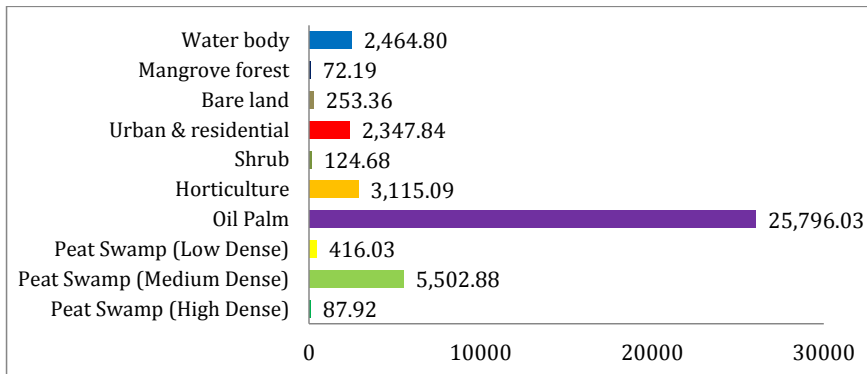
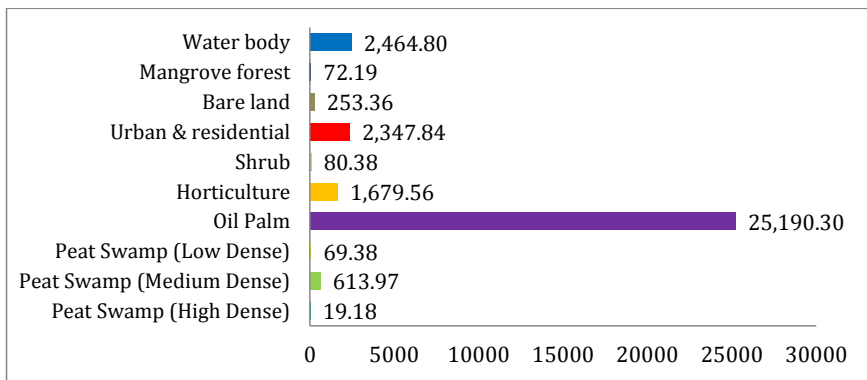


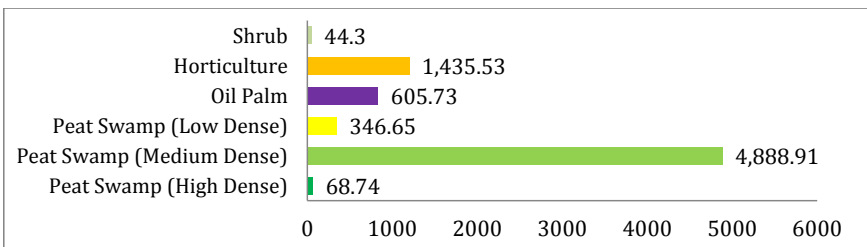
Figure 5 Status of PSF in the study area



(a): Study area

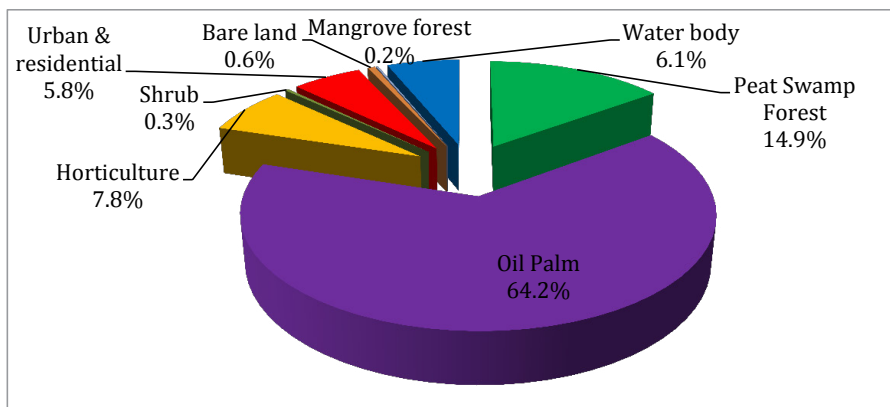


(b): Stateland area

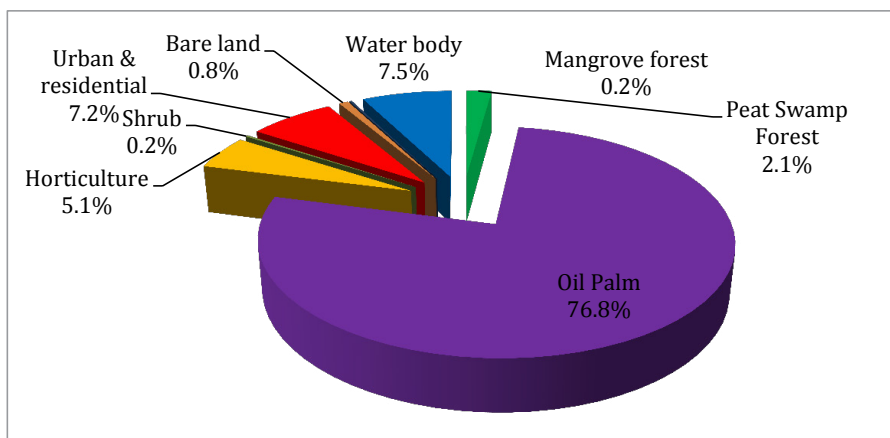


(c): KLSFR

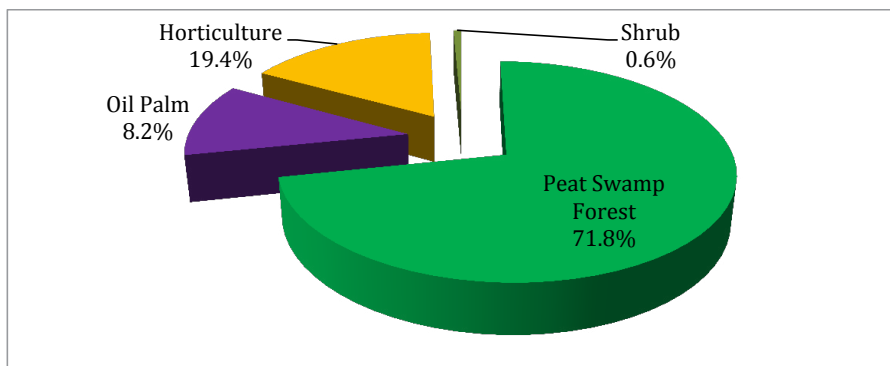
Figure 6 Statistic of land use class (a) Study area, (b) Stateland area and (c) KLSFR



(a): Study area



(b): Stateland



(c): KLSFR

Figure 7 Percentage of land use class (a) Study area, (b) Stateland and (c) KLSFR

2.4 Forest Stocking and Aboveground Carbon Stock in KLSFR

In this study, forest stocking was estimated using an arithmetic model developed using satellite images and ground inventory data collected at the Raja Musa FR that was derived from JPNS (2000). Landsat TM image for 2001 was used to perform this process. The ground data set and the generated NDVI from the satellite image are listed in **Table 4** and the arithmetic model developed from the correlation between these two parameters is shown in **Figure 8**.

Table 4 Ground inventory data and generated NDVI from satellite image

Estimated Forest Stocking (m ³ ha ⁻¹)*	Mean NDVI (Year 2001)
79.36	0.2722
79.36	0.2357
60.89	0.1561
79.36	0.2585
0.00	0.0009
79.36	0.2936
0.00	0.0000
60.89	0.1959

*Note: Measurement was made in 1999 for trees ≥ 15.0 cm DBH

The NDVI was used as an indicator for the estimation of forest stocking in the study area. This index can be generated from both Landsat-TM and SPOT images, which enabled the forest stocking to be estimated.

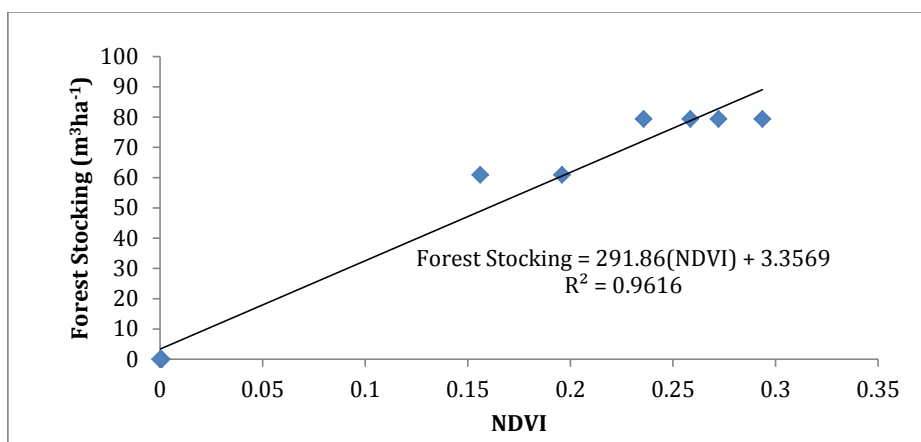
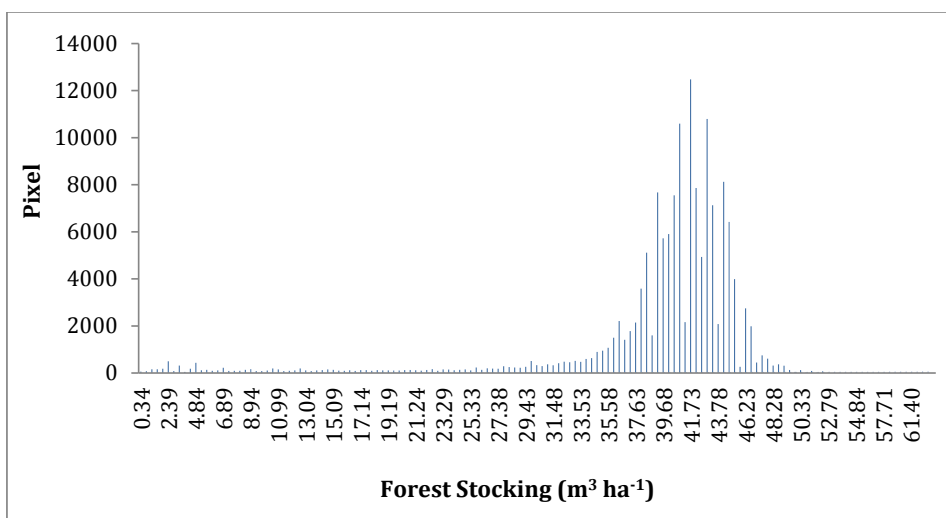


Figure 8 Relationship between aboveground carbon stock and NDVI

The SPOT-5 image that was converted to NDVI values allowed the calculation of the forest stocking in the study area. It was found that the total forest stocking in the KLSFR area in 2010 is about 5,915,202 m³. Meanwhile, the distribution of aboveground carbon stock in the PSF areas of KLSFR ranged from 0 to 69.2 t ha⁻¹ (**Table 5**) with a mean value of 39.58 t ha⁻¹. The statistics of estimated forest stocking in the KLSFR area is shown in **Figure 9**. The forest stocking map of the KLSFR is shown graphically in **Figure 10**.

Table 5 Estimation of aboveground carbon stock for PSF area in the KLSFR

Peat swamp forest	KLSFR (ha)	Aboveground carbon (t)
High dense	68.74	2,720
Medium dense	4,888.91	193,503
Low dense	346.65	13,720
Total	5,304.30	209,943



Forest Stocking	Minimum (m³ ha ⁻¹)	Maximum (m³ ha ⁻¹)	Mode (m³ ha ⁻¹)	Average (m³ ha ⁻¹)	Total (m³)
Peat swamp forest	0.34	69.59	42.41	39.58	5,915,202.4

Figure 9 Estimated forest stocking of PSF area

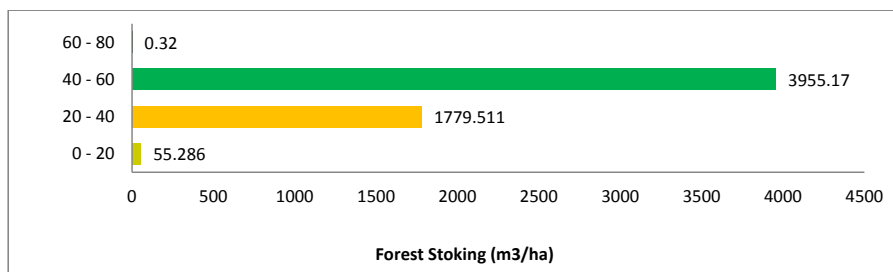
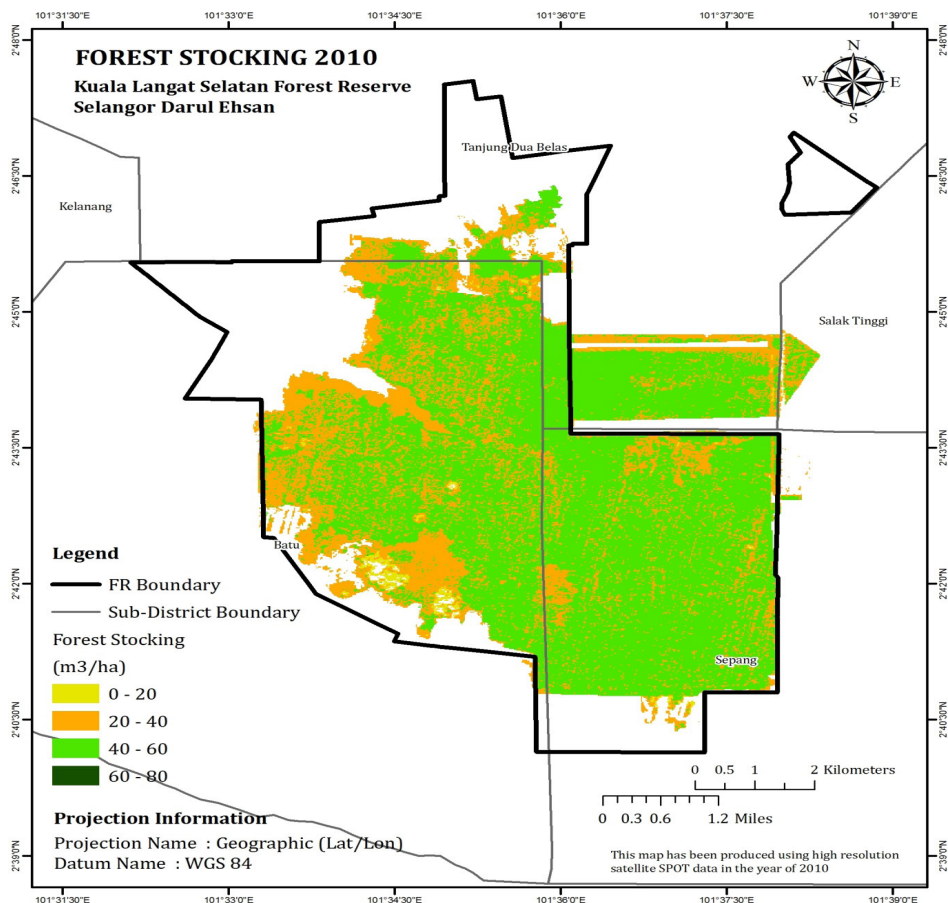


Figure 10 Forest stocking map of PSF area in 2010

2.5 Proposed Forest Activities for KLSFR

Proposed forest activities for the KLSFR are as follows:

i) Marking or remarking forest boundary (**Figure 11**).

The boundaries of the KLSFR need to be clearly demarcated to ensure that the public is aware of the boundary to prevent encroachment and the conduct of other illegal operations within the site. The total length of boundary of the KLSFR is about 53,883 m (~54 km) and the estimated budget for marking or remarking of the forest boundary for Selangor is about RM7,000 km⁻¹ (*pers. obs.*). Therefore, the total budget required would be about RM378,000.00. The activity could be conducted on an annual basis and staggered for five years in line with the 5-year Development Plan for easier planning and budget allocation.

ii) Implement enrichment planting and rehabilitation programmes (**Figure 11**).

To enhance the overall productivity and to assist in the recovery of the study site, assisted regeneration through enrichment planting programmes is proposed particularly in the poorly stocked (low dense) areas. The low dense areas of the KLSFR, which covers about 346 ha could be given priority for the rehabilitation programme. Based on Ismail (2012), the average cost of planting in the PSF is about RM3,000.00 ha⁻¹. The estimated total cost required for the programme is about RM1,038,000.00. The activity could also be conducted on an annual basis, i.e for 5 - 10 years duration. As a note, there are already existing rehabilitation activities in this area mainly in the northern part of the KLSFR.

iii) Conduct community forestry programme (forest planting/agro-forestry & forest fires monitoring).

To ensure the project site is protected from further threats, it is important to enhance the awareness of the communities in the vicinity of the study site and to involve them in community forestry programmes. There is a crucial need to get the involvement of the relevant stakeholders in managing the forest as the KLSFR is being surrounded by human settlements. Their involvement would directly lead to a better management and conservation of the forest. The estimated allocation of about RM50,000.00 annually may suffice to implement the activities.

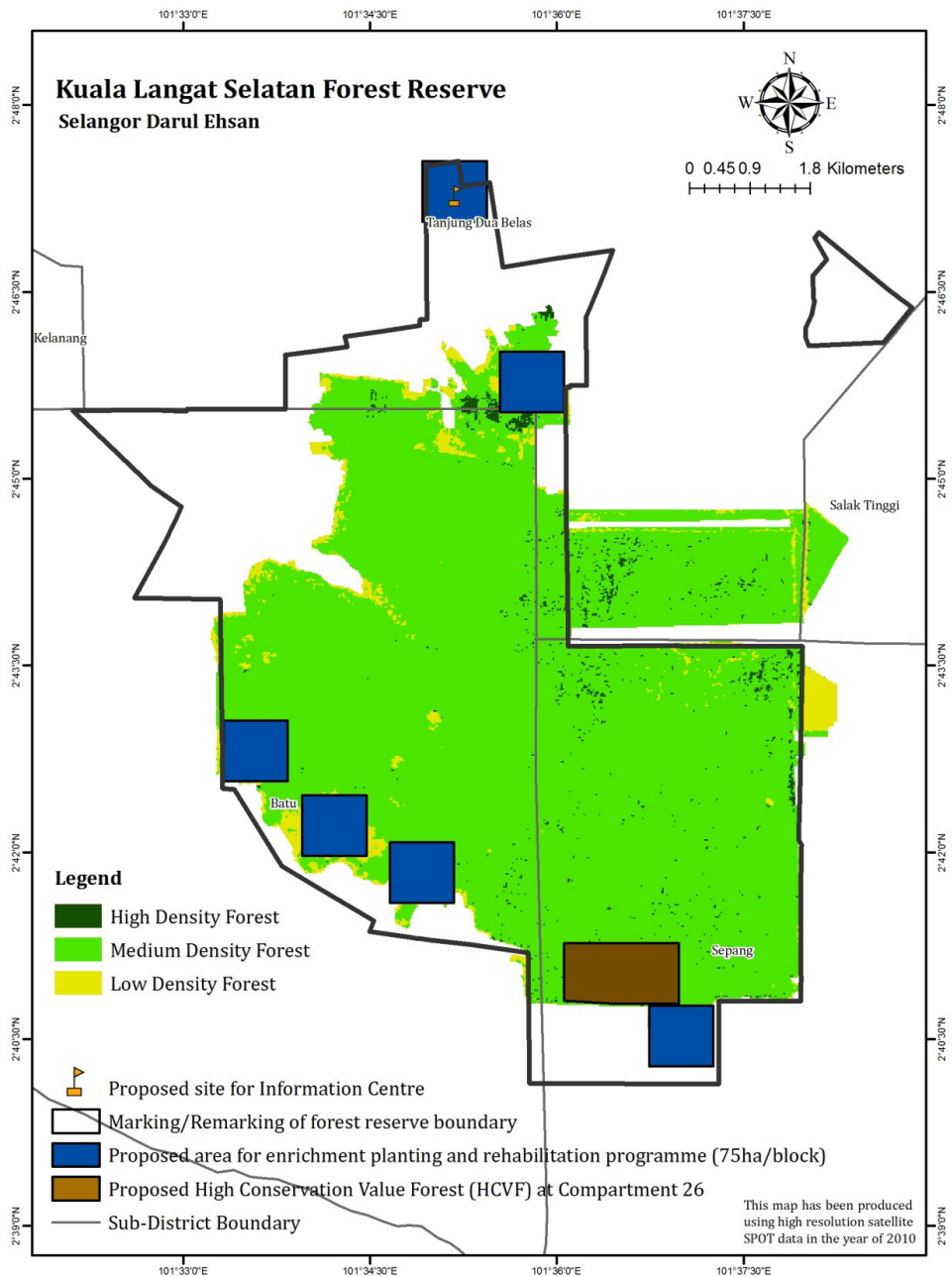


Figure 11 Proposed forest activities for the KLSFR



Chapter 3

CONCLUSION AND RECOMMENDATIONS

3.1 Conclusion

This study has successfully classified the various land uses in the KLSFR and its surrounding areas which extent for about 40,000 ha (20 x 20 km). The KLSFR covers an area of about 7,390 ha based on the secondary data derived from external forest reserve and compartment boundaries (official figure quoted by FD Selangor is 6,908 ha). In addition to the KLSFR, there are PSF and other land uses such as oil palm, horticulture and urban areas within the study area. The preparation of this Blueprint was based on the existing secondary data and limited primary data available. Nonetheless, if necessary, consultations with other relevant stakeholders such as the locals surrounding the area might be useful to further strengthen the Blueprint by taking into consideration their views and concerns. This would enable for its smooth implementation and satisfy the needs of important stakeholders in the areas.

This study estimated the total forest stocking for the PSF is about 5,915,202 m³ for trees 15 cm DBH and above. Aboveground carbon for the PSF (high, medium & low dense) in the KLSFR is estimated at 39.6 t ha⁻¹ with a total of about 209,943 tonnes. Forest activities such as boundary marking, silviculture treatments as well as community programmes are important and need to be conducted in the KLSFR to increase the quality of the forest resources and to reduce the occurrence of forest fires. The role of the KLSFR in conserving biodiversity and stabilising the environment can be enhanced by implementing these activities. Indirectly, the quality enhancement of the forest within the KLSFR will provide justification and support in protecting the area as a forest reserve.

3.2 Recommendations

Some recommendations for the respective stakeholders to consider are as follows;

- i) Conduct community participatory appraisal to understand baseline issues and potential solutions of land use in the KLSFR;
- ii) Prepare Integrated Management Plan (IMP) for KLSFR and the surroundings areas. There is a need to organise stakeholder consultations for the development of the IMP that involve local communities and relevant government departments;
- iii) Promote and enhance agro-forestry practices in leased areas. Farmers need to plant and maintain the forest trees species in their farming areas;
- iv) Increase regular patrolling and monitoring to prevent encroachment, forest fires and other detrimental activities. Additional FD Selangor staff for the Range Office at Banting will be necessary;
- v) Conduct comprehensive study on forest fire prevention for the KLSFR. Among important elements are water management and identifying/ mapping of existing drainage. The water management element is crucial to prevent forest fires and to control release of carbon to the atmosphere by the degraded PSF;
- vi) Allocate part of the KLSFR as high conservation value forest (HCVF) areas of PSF in Selangor. The VJR at Compartment 26 might be suitable for the HCVF (refer Figure 11). This is in line with the FD Selangor's plan as stated in the Forest Management Plan Selangor, 2011-2020 (FD Selangor 2010). Main species to be conserved in this area is meranti bunga (*Shorea teysmanniana*);
- vii) Conduct proper study for the quantification of total carbon stock and other environmental services function of the KLSFR;

- viii) Assess the possibility of getting external funding from international mechanisms such as from REDD+, Voluntary Carbon Scheme (VCS) and Payment for Ecosystem Services (PES) to enhance the value and to enable better protection of the site;
- ix) Establish a one-stop centre or information centre for PSF in the KLSFR. The proposed site is at Compartment 55 which is the entrance to the KLSFR from the north, easily accessible and one of the existing rehabilitation sites (refer **Plate 8 & Figure 11**). The centre can be used among others for dissemination of relevant information, data collection and PSF monitoring site office. However, this area has risk of forest fires, therefore as a short term effort, a water gate should be constructed to control water level. This is an effective method to control forest fires as successfully implemented in the ASEAN Peatland Forest Projects' pilot site at Batang Berjuntai, Kuala Selangor. Conducting a possibility study on the potential use of ground water as a source of water for fighting forest fires in this area is also recommended as the area has no surface water at all during dry season; and
- x) Explore the potential of the site for ecotourism. The study area will be better protected if its economic value is enhanced through ecotourism. Since the site is close to Kuala Lumpur International Airport (KLIA) and Kuala Lumpur, it has a potential to attract both local and foreign tourists.

Glossary

Blueprint: The most common and technical usage of the word blueprint is that of a blueprint for a building, which is a technical print of a drawing, with white lines printed on a blue background. The word has also taken on the more general meaning of “a plan.” The word blueprint can also be used as a verb, “to plan”.

Carbon sink: Any process or mechanism of absorbing carbon dioxide and retaining stocks of carbon in organic matter such as forests, oceans and soil more than it is released back into the atmosphere.

Carbon stocks: The quantity of carbon contained in a “pool”, meaning a reservoir or system which has the capacity to accumulate or release carbon. In the context of forests it refers to the amount of carbon stored in the world’s forest ecosystem, mainly in living biomass and soil, but to a lesser extent also in dead wood and litter.

Climate change: a change in the mean meteorological parameters that define climate of their variability. Climate is not the same as weather, but rather, it is the average pattern of weather for a particular region. These parameters include temperature, rainfall and wind speed. In the United Nations Framework Convention on Climate Change (UNFCCC), on climate change issues caused by anthropogenic (human-induced) factors are included.

Forest: FAO defines forests as: land spanning more than 0.5 ha with trees higher than 5 m and a canopy cover of more than 10%, or trees (including areas with bamboo and palms) able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use. For Afforestation Reforestation Clean Development Mechanism (AR CDM) purposes, participating countries are required to submit their definition of forest to the Executive Board, which registers CDM projects to enable generation of carbon credits. Malaysia’s definition of forest is: land area more than 0.5 ha with trees higher than 5 m and canopy cover of more than 30%.

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