

PERMANENT SAMPLE PLOTS WITHIN PIN SUPU FOREST RESERVE NATURAL FOREST IN 2015

1.0 Background

Monitoring of forest health and overall functionality of the existing forested area is of paramount importance. This could be executed by establishing of long-term ecological research plots or permanent sample plots (PSPs). These plots are used for documenting detailed changes in forest structure and composition. The output of the plots could provide baseline information on distributions of species and habitats of a particular site. The long-term monitoring activities, such as assessment of the standing trees of these plots would provide valuable information on the changes in plant diversity and richness, growth, mortality, regeneration and dynamics of the sampled forest. This information on forest changes is an indicator of forest health and functionality. Elephants disturbed previous PSPs established by Forest Research Centre in 2009. The two 1.2 ha sampling area that located adjacent to Danau Kaboi consist of 30 composite blocks (20 m × 20 m per block) per plot and utilized numerous PVC posts to demarcate the plot boundary. All the posts were removed and trampled. Due to this, the management team is adopting the 20 m radius circular plot with only one PVC post that indicates the plot centre. In April 2015, ten PSPs were established to monitor forest health and functionality. Table 1 shows the list of established Permanent Sample Plot meanwhile Table 2 is the summary of trees enumerated. Figure 2 shows the location of the plots. The management team will establish more PSPs throughout the management period to increase spatial data and improve accuracy of forest ecosystems information.

2.0 Plot layout

The permanent sample plot layout consists of circular design with 20 m radius (Figure 1). The centre of the plot were clearly marked by erecting permanent post i.e. PVC pipe. All trees ≥ 10 cm diameter at breast height or 1.3 m above ground level were enumerated by measuring the stem diameter, determine the species identity, and tree location parameters, such as distance, slope angle and also the azimuth from the centre of the plot. Five (5) large and healthy trees were selected and labelled on the ground using aluminium tags as reference trees and will be used to re-establish the centre point of the plot for future enumeration should the centre post went missing. Tree number and point of measurement of all enumerated trees were labelled with yellow paint (signal yellow).

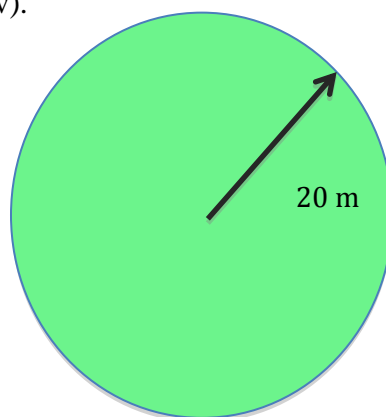


Figure 1. A circular plot with 20m radius.

3.0 Maintenance of Permanent Sample Plots

Maintenance of permanent plots consisted of activities as follows:

- i. Determining the presence of centre post and tree labels and
- ii. Disturbance to the vegetation within the plot, including look out for severe damage to the plots, and investigate its cause.

The maintenance is required periodically to ensure relocation; re-establishment and re-measurements of the trees could be done accurately. The maintenance should be carried annually.

4.0 Assessment of Permanent Sample Plots

Experience across a range of forest types suggests a **5 to 10 years** interval is generally suitable for monitoring demography of tree populations, and changes in the forest structure and composition. Re-measurement interval of 5 years is recommended for Pin Supu Forest Reserve.

Table 1. The location of the permanent sample plots that were established in April 2015 of Pin Supu Forest Reserve.

Block	Plot	Lat	Long	Altitude (m)	Forest Condition
C	PSU 1	5 20 35.2	117 52 26.2	112	Regenerating/advance growth Mixed Dipterocarp Forest
C	PSU 2	5 20 39.9	117 52 28.1	89	Regenerating/advance growth Mixed Dipterocarp Forest
B	PSU 3	5 26 28.6	117 55 08.1	23	Secondary Forest (Seasonal Freshwater Swamp Forest)
B	PSU 4	5 26 32.8	117 55 10.1	7	Secondary Forest (Freshwater Swamp Forest))
B	PSU 5	5 26 30.1	117 54 34.4	15	Secondary Forest (Lowland Mixed Dipterocarp Forest -Alluvial Terrace)
B	PSU 6	5 28 32.7	117 55 05.3	54	Regenerating/advance growth Lowland Mixed Dipterocarp Forest (limestone outcrops)
A	PSU 7	5 25 01.2	117 57 41.8	25	Secondary Forest (Seasonal Seasonal Freshwater Swamp Forest))
A	PSU 8	5 25 13.5	117 57 36.4	20	Secondary Forest (Seasonal Seasonal Freshwater Swamp Forest))
A	PSU 9	5 29 24.8	117 57 48.6	31	Regenerating/advance growth Mixed Dipterocarp Forest
A	PSU10	5 29 28.2	117 58 54.1	19	Secondary Forest (Seasonal Seasonal Freshwater Swamp Forest)): Talisai Paya Swamp

Table 2. Diameter distributions of tree species groups within permanent sample plots (N=10) Established in 2015

Species Group	Diameter Class Distribution (cm)								Total
	10 -19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	≥ 80	
Dipterocarp	172.2	124.2	142.7	133.8	330.5	201.1		178.3	1,282.8
Fruit Trees	206.6	113.3	137.7	129.5		64.0		80.0	731.1
Others	4,542.3	2,706.1	1,730.5	1,783.6	488.2	381.0	140.8	272.5	12,045.0
Pioneers	75.8	79.9		41.5					197.2
Total	4,996.9	3,023.5	2,010.9	2,088.4	818.7	646.1	140.8	530.8	14,256.1

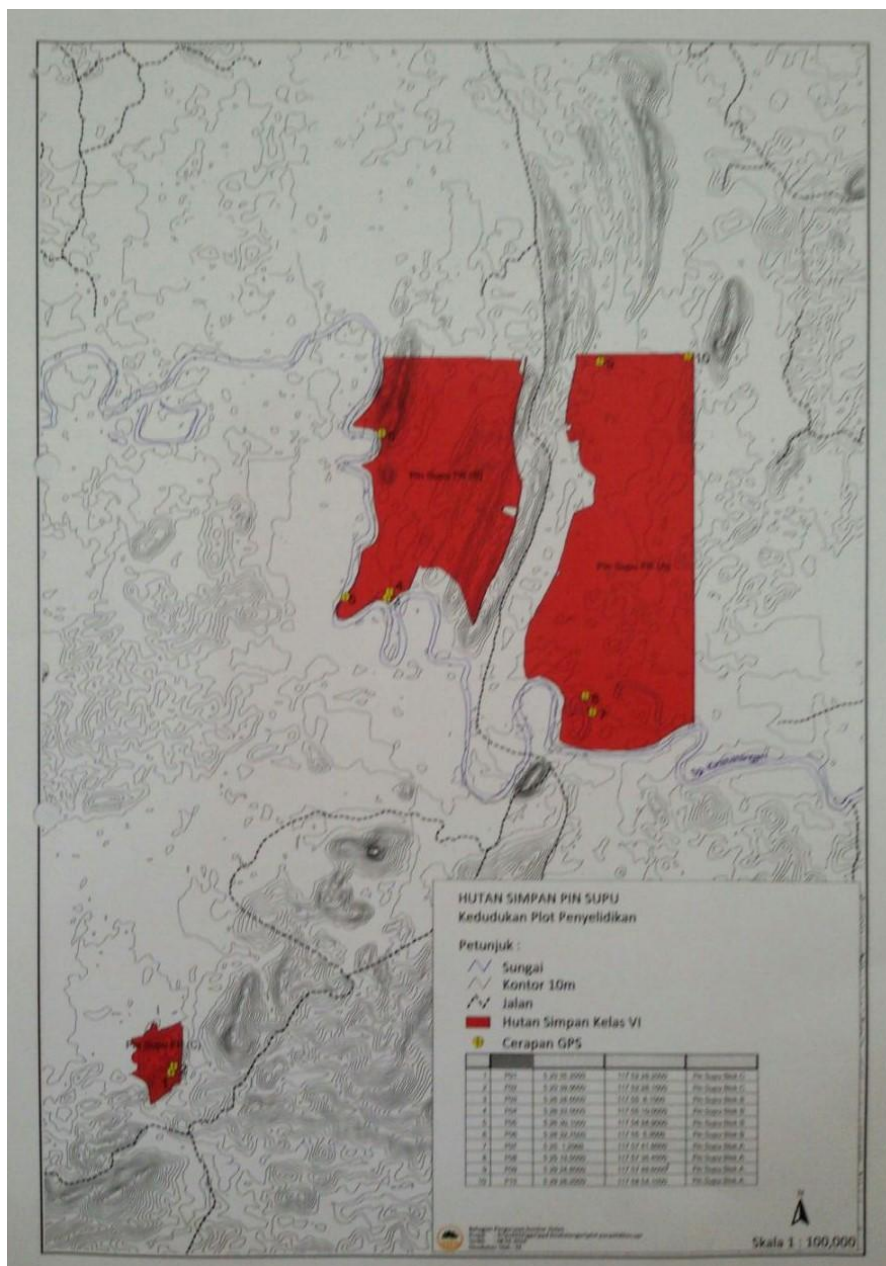


Figure 2: Location of Permanent Sample Plots within PSFR