Annals of Tropical Research 38[2]:30-51(2016)

Floral Composition and Timber Stock of Forest In The Samar Island Natural Park

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ABSTRACT

Samar Island Natural Park (SINP) is the most important biodiversity refuge Samar Island. This assessment characterized floral diversity status in SINP and provided recommendations on how such resources can be better managed and protected against destruction. Five watersheds, namely: Taft, Can-avid, Basey, Suribao and Catubig were sampled. In each watershed, a transect line with 25 plots spaced at 200 m interval was used in the survey. Plot size was 20m x 20m. Trees 10 cm in diameter at breast height (DBH) and bigger were measured for stem diameter, merchantable height and tree height. This was for computation of timber volume. The species composition in 3 vegetative layers, such as tree layer, undergrowth and ground layer, was determined using the standard Braun-Blanquet methodology.

The forest stands in the five watersheds was dominated by dipterocarp species. Of the 212 timber tree species in the tree layer, 35 species had diameter of at least 60 cm. Eighty-six percent of individual trees were dipterocarps, in 14 species. *Shorea squamata* and *Shorea polysperma* was the most frequent. Non-dipterocarp species dominated in number at the lower DBH range, particularly in the 10-20 cm and 21-40 cm DBH range. The forest of Samar still has high volume of commercial-size timber.

Forests in the 5 watersheds differed in species composition and structure. The absence of access roads to interior barangays contributed to the conservation of forests. The transport system, such as presence of access road and connecting transport facilities to the main roads had influence to the degree of poaching activities. Areas that had access only through motorboats in shallow river had lowest incidence of poaching.

Keywords: Natural park, Philippine flora, biodiversity

INTRODUCTION

The Department of Environment and Natural Resources (DENR) Administrative Order 25, series of 1992, serves as the implementing rules and regulations of the National Integrated Protected Area System (NIPAS)

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DOI: 10.32945/atr3823.2016

General Management Planning Strategy, which will guide the formulation of the general management plan for each protected area. Each protected area of the country is required to have a management plan prepared by three experts, one of which is on field inventory of resources within the area.

The Samar Island Natural Park (SINP) is located at the core of Samar Island and, as provided for by Presidential Proclamation 442, it measures 333,300 hectares and has a buffer zone of 124,500 hectares. It covers 8 major watersheds, which include 19 municipalities of Eastern Samar, 14 municipalities of Samar Province and 4 municipalities of Northern Samar. This should be the third time a floral inventory is conducted in the area. The first one was the preliminary floral inventory done by Quimio and Patindol (1999), a document used in support for the proposal to United Nations Development Program UNDP to provide funds for the Samar Island Biodiversity Project (SIBP). The second was the biological resources assessment conducted by SEAMEO-SEARCA (2004), being one of the major activity components during the implementation of the project and in consideration of converting the area to become the Samar Island Natural Park and inclusion to the Global Environmental Facility (GEF) through the (UNDP). This third one was on post-project biological resources assessment for the SIBP, which had been conducted again by Quimio and Patindol (2012). The assessment covered both flora and fauna, but due to space limitation, this paper would be only on flora.

The first two assessments were focused on measurement of flora on species diversity in the existing forests. The first one failed to do timber measurements due to time constraints. The second one was conducted by a group of botanists and assessments were concentrated to number of species, relative frequencies of species and the endemics and rare species in the area. This third one included measurements on timber size and timber volume and the assessment of threats to forest resources, together with the measurement of floral diversity and the degree of similarity in species composition among sampling sites. Baseline information on the structure and species composition of the timber components in sampled forest sites is important as benchmark data to detect change in terms of structural improvement, or even if there is degradation, in the future. It is generally agreed that structural diversity of forests is also associated to species diversity not only of flora but also of fauna. Besides, monitoring for change in structural diversity and degradation in forest is much easier to undertake than to monitoring of floral diversity at the species level. For the operations of the SINP, whose personnel are mostly foresters, protecting the forests in general would also mean protecting the biological diversity therein.

The general objective on the assessment of flora inside SINP was to establish baseline data on existing flora and assess the treats to biological diversity. The specific objectives include the following:

1. To determine the floristic composition of forests;
2. To characterize the existing timber stock of forests;
3. To identify and assess potential threats to biodiversity; and
4. To provide bases for policy recommendation and inputs in updating the SINP management plan

MATERIALS AND METHODS

The Study Area

The Samar Island Natural Park has 8 major watersheds: Suribao, Can-avid, Catubig, Taft, Basey, Dolores, Gandara and Pambujan. This study covered only the first five watersheds.

The SINP has abundant rainfall with mean annual rainfall of about 3,600 mm. Climatic types II and IV prevail in the area. Type II is characterized by having no dry season, with pronounced maximum rainfall period in the months of December and January. Type IV has more or less even distribution of rainfall throughout the year, or without period with maximum rains. Within the protected area, only about 2% can be considered flat, 14% as undulating to flat and the rest is rolling to moderately steep and very steeply mountainous. The soil is clay loam to clay.

The geology is mostly Miocene to Holocene sedimentary rocks and sediments. Where the SINP is located, the sedimentary formation generally consists of basement rocks, sometimes with overlying clastic rocks or limestone. The area consists of an interior highland with marked accordant peaks and a surrounding limestone or karst terrain. The southern peninsula is made up of jungle-covered limestone ridge that appears to be a younger coral reef. The central highlands are principally of igneous complex intercalated with metamorphosed sedimentary rocks. With The presence of thick mantle of laterite soil, indicates that the igneous rocks have been subjected to intense mechanical and chemical weathering. A more complete physical characterization of the SINP area is presented in UNDP-GEF (2007).

Data Collection

One transect line each for Suribao Watershed, Can-avid Watershed, Catubig Watershed, Taft or Ulot Watershed and Basey Watershed had been laid for data collection. The transects were laid in Barangay San Rafael in Taft Watershed, Sitio Tula in Can-avid Watershed, Basey in Basey Watershed, Barangay Benowangan in Suribao Watershed and Las Navas in Catubig Watershed. Each transect had 25 sampling plots, with distance interval of 200 meters, to a total length of 5 kilometers. Following the Smithsonian Institute tradition on sampling of forests, the plot size used was 20m x 20m. This gave a total forests area of one hectare composite sample per watershed, or a total of 5 hectares for the 5 watersheds.

Two sampling methodologies were applied during the collection of data in plots. These were: 1) for data on species and sizes of standing timber and 2) for floristic data on species, plot cover dominance of species and frequency of occurrence of species through Braun-Blanquet (1964) methodology.

Tree Measurements

The plots had the North-South and East-West directions on sides. Upon determination of the corners of the plot, trees standing within the plot were measured. At each tree, the species was first identified and then diameter at-breast height (DBH) was taken and recorded. Only trees with DBH of 10 cm and larger were taken for measurements. The determination of merchantable height (MH) and tree height (TH) then followed. The MH and TH were determined based on estimates. The crew had undergone training exercises in estimating heights days before going into data collection.

Though trees smaller than 10 cm in diameter were not included in the measurements, they are not actually left out in the data collection particularly in view of assessing the totality of species diversity. The occurrence of wildlings, saplings or small trees and non-tree species especially those in the ground layer of forest stands were designed to be covered by the data collection under the Braun-Blanquet methodology.

The Braun-Blanquet Methodology

This methodology is based on 100% identification and listing of all species in the plots. At each plot, data collection was undertaken separately for each of the 3 canopy layers or vegetative stratifications. The vegetative strata used were: 1) ground layer, for plants of up to 2-m high; 2) understory, for plants whose leaf canopy reaches 2-m to 7-m high; and, 3) the tree layer, for all plants over 7-m in height.

At each layer data collection started with identification of all species present. After all the species had been listed, we returned to the uppermost part of the list of species. The plot cover dominance for each of the species in the list was estimated and recorded. The listing of species and the recording of their respective plot cover dominance were first done for the tree layer, followed by the undergrowth layer and then for the ground layer. The recording of the plot cover dominance scale for all species was based on Braun-Blanquet (1964) scale, as show in the table that follows below. For plants that can grow big and express canopy dominance, particularly the tree species in forests, percent plot cover was given importance over the number of individuals. For smaller plants, especially those not reaching 5% plot cover dominance, the number of individuals was also given importance. This is because for small plants, including the case of wildlings of potentially large tree species, abundance in terms of number can provide more meaningful interpretation than the degree of spread of their foliage.

Scale	Plot Cover Dominance
5	70-100% plot cover
4	50-75% plot cover
3	25-50% plot cover
2A	15-15% plot cover
2B	5-15% plot cover
2M	<%5 plot cover, over 50 individuals
1	< 5% plot cover, 6-50 individuals
+	< 5% plot cover, 3-5 individuals
R	< 5% plot cover, 1-2 individuals only

Data Presentation and Interpretation

The Braun-Blanquet data were presented in a vegetation table which shows relative dominance of species in plots and across plots in the 5 transects, giving the range of spread or distribution of all species within and across the 5 watershed areas.

The degree of similarity in species composition among transects was presented using a table on Jaccard indices. Jaccard index was calculated using the formula below:

$$J = \frac{c}{a + b - c}$$

where: J = the Jaccard index
a = the number of species in the first population;
b = the number of species in the second population;
c = the number of species occurring in both populations.

The denominator in the above formula was the combined number of species that occurred in both populations. Thus, the Jaccard index is simply the decimal point ratio on number of species common to both populations over the total number of species that occurred in both populations. When the decimal is moved two places forward and multiplied by 100, the result would be the percentage of species that occurred in common to both populations over the total number of species from both populations.

RESULTS AND DISCUSSION

A. Timber Stand Structure

1. Timber stock volume

The 5 watersheds had an average of only 35 trees/ha, for trees with DBH of 10 cm and higher (Table 1). Large trees of up to over 120 cm were recorded but the greatest number was in 10 cm (61%) to 40 cm (25%) in DBH (Table 2 and Figure 1). The predominance of small diameter trees and very low number of large trees can be attributed to past logging operations. Apparently, however, the difference in number of large trees from one watershed to the other can be associated to still too visible damage by timber poaching. The comparative higher number of trees with above 60 cm DBH (Table 2) in Sitio Tula and Can-avid Watershed and in Barangay Las Navas in Catubig Watershed can be associated to observed much lower extraction of large trees. The transect in Las Navas was too remote from villages and in an area with critical peace and order situation.

The situation in Sitio Tula is entirely different and its implications should be given attention in SINP's conservation strategies. The transect was only 300 meter away from the village. The village is accessible only from the main road by a wooden canoe. Because the river is too shallow the canoe can accommodate only 2 passengers plus the pilot. Thus, it is not possible to transport lumber out of the area. Lumbering was only for on-site consumption. Most houses were wooden, large and 2-storey but old. There were no new houses for new families. Quite observable in the village was the absence of youth age bracket but many grade school children and the olds. After grade school, the children leave for high school, seek house help jobs and very rarely return to Tula to establish a family. People in Sitio Tula highly depend on remittances from Manila and in tapping the resins of apitong (*Dipterocarpus grandiflorus*). Claim to ownership of apitong trees redound to their conservation. The economic carrying capacity of forest resources in Sitio Tula and mode of transport seemed to be what put limit to population increase. With the dominance of large trees and good canopy cover, the undergrowth and ground plants in the forest of Sitio Tula was subdued by competition for light.

In Barangay San Rafael of Taft Watershed, the removal of large trees encouraged the regeneration of dense stand of pole-size trees. These are the ideal size for the axe in highly observable charcoal making at that time. The forests in Basey Watershed and in Barangay Benowangan of Suribao Watershed had much reduced number of large trees but regeneration should be given the chance to compensate for the current rate of extraction.

Past removal of medium-size and large trees in Benowangan gave it the lowest timber volume but, as a consequence, this also opened-up the undergrowth to sun light which encouraged the growth of thick thicket of saplings and pole-size trees (Table 3).

The average timber stock in 5 watersheds was only 1,400 cu.m/ha, very much low to justify commercial logging operations. Tula and Las Navas had the highest standing timber volume of 1,782 cu.m/ha and 2,304 cu.m/ha, respectively. These same two watersheds also got the highest basal area of 81.7 and 84.7 sq m/ha, respectively.

The predominance of small diameter trees resulted to low average of 26.61 cm in DBH Table 1), though there were trees with recorded DBH of up to over 120 cm (Table 2). The average height of trees in 5 watersheds was 20.5 m but few trees particularly those growing in foot-slopes and valley bottoms were estimated to reach over 60 meters in height (Figure 2).

Table 1. Totals and plot averages in tree measurements in 5 transects, for trees 10 cm in DBH and bigger. DBH = diameter at-breast height; MH=merchantable height; BA=basal area; VOL=timber volume; TH= tree height

Watershed	Factor	No. of Individuals/plot	DBH, cm	MH, m	BA, sq m	VOL, cu m	TH, m
Taft	Average	43.64	22.41	10.63	2.686	40.98	15.74
Can-avid	Average	40.32	25.39	13.92	3.414	74.70	21.21
Basey	Average	30.88	27.19	14.65	2.312	45.65	22.29
Suribao	Average	37.96	22.49	12.34	2.147	33.96	18.40
Catubig	Average	22.60	35.56	16.90	3.505	94.95	24.84
Average		35.08	26.61	13.69	2.813	58.05	20.50
		Stems/ha			Sq.m/ha	Cu.m/ha	
Taft	Total	1,091	-	-	65.483	1,002	-
Can-avid	Total	1,008	-	-	81.730	1,782	-
Basey	Total	772	-	-	55.363	1,101	-
Suribao	Total	949	-	-	52.017	830	-
Catubig	Total	565	-	-	84.698	2,304	-
Average		877			67.86	1,404	

Table 2. Frequency distribution of trees by diameter range, in cm

Transect Site	10-20	21-40	41-60	61-80	81-100	101-120	>120	Total
A. Based on in number of trees transects.								
Taft	844	103	67	13	12	7	5	1,051
Can-avid	542	317	78	21	10	11	9	988
Basey	351	274	99	17	5	2		748
Suribao	631	185	57	11	9	2	2	897
Catubig	216	193	65	40	21	9	12	556
Total	2584	1072	366	102	57	31	28	4,240
B. Based on percentage of transect total. 218/4240 = 5.45%								
Taft	80.30	9.80	6.37	1.24	1.14	0.67	0.48	100
Can-avid	54.86	32.08	7.89	2.12	1.01	1.11	0.91	100
Basey	46.92	36.63	13.24	2.27	0.67	0.27	-	100
Suribao	70.34	20.62	6.35	1.23	1.00	0.22	0.22	100
Catubig	38.85	34.71	11.69	7.19	3.78	1.62	2.16	100
Total	60.94	25.28	8.63	2.40	1.34	0.73	0.66	100

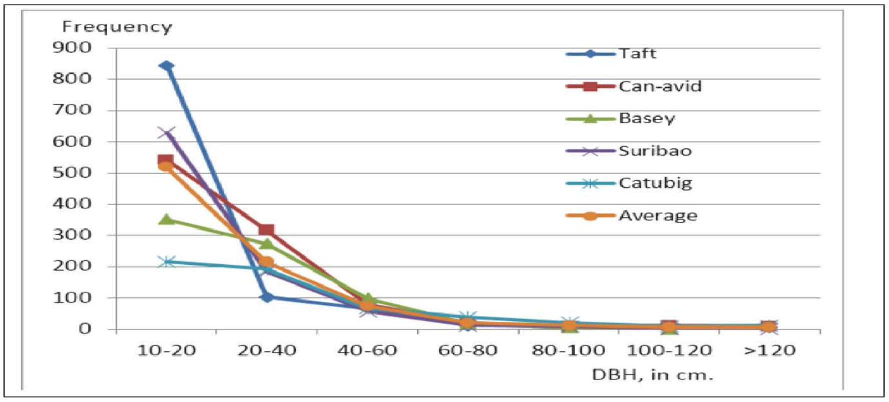

Figure 1. Frequency of trees per DBH bracket in the five watersheds, which is indicative of removal of large timber in past logging and timber poaching

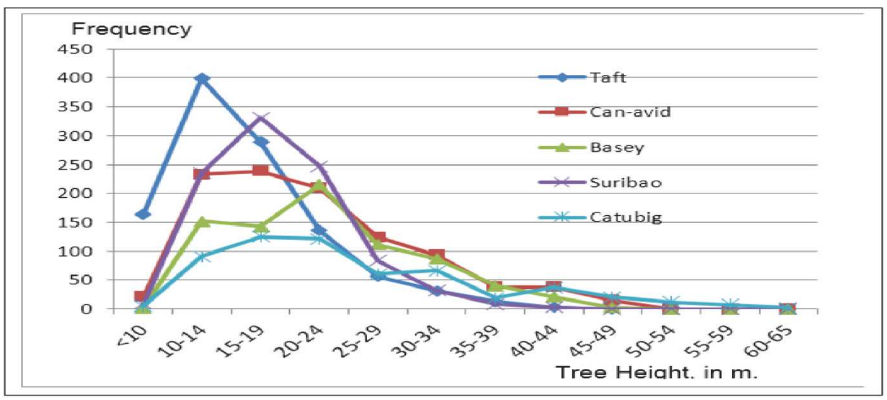

Figure 2. Frequency on tree height in the five watersheds, with central tendency at 10-30 m height range, though there are still some large trees

Table 3. Average plot canopy cover in the 3 vegetative strata, in percent

Transect Site	Plot, All Layers	Tree Layer	Undergrowth Layer	Ground Layer	Slope, degrees
Taft	79.8	34.6	23.52	34.2	39.6
Can-avid	82.4	64.4	31.0	29.8	21.8
Basey	70.2	52.0	37.0	31.0	16.1
Suribao	73.8	55.4	36.2	31.6	19.4
Catubig	81.5	61.4	22.4	22.6	18.6

2. Species of standing timber in watersheds

Among the trees that reached the commercial size of 60 cm DBH and larger, 35 species were recorded (Table 4). Ten species of the family Dipterocarpaceae were the most frequent, which indicated that forest in SINP is truly a dipterocarp forest. These were Shorea polysperma, Shorea squamata, Shorea almon, Shorea astylosa, Parashorea plicata, Shorea philippinensis, Hopea malibato, *Dipterocarpus grandiflorus*, *Dipterocarpus validus* and *Hopea foxworthyi*. Again, Can-avid and Catubig

Watersheds had the highest number of large trees.

The range of occurrence of timber species, including those in the smaller DBH brackets, can be better seen in Table 5. Fourteen (14) dipterocarp species were listed, though only ten of them was recorded having DBH above 60 cm. Seven (7) dipterocarp species were found widespread by being present in the 5 watersheds. These were *Shorea squamata, Shorea gisok, Shorea polysperma, Hopea foxworthyi, Hopea malibato, Shorea almon* and *Shorea astylosa.* The other 7 dipterocarp species, such as the *Dipterocarpus grandiflorus, Parashorea plicata, Shorea philippinensis, Shorea negrosensis, Dipterocarpus gracilis, Anisopthera thurifera* and *Dipterocarpus validus* showed confined range of occurrence by being present in one or two watersheds but absent in other watersheds. There were 30 non-dipterocarp trees that showed high constancy of occurrence in the 5 watersheds, thus, can also be considered frequent and widespread timber species in SINP. These species were *Blumeodendron philippinense, Pouteria velutina, Myristica philippinensis, Vitex quinata, Calophyllum blancoi, Lithocarpus llanosii, Canarium hirsutum, Myristica laxiflora, Palaquium luzoniense, Radermachera pinnata, Reinwardiodendron celebicum, Myrica javanica, Polyalthia oblongifolia, Jossinia tulanan, Neotrewia cumingii, Garcinia oligophlebia, Memecylon sessilifolium, Strombosia philippinensis, Chisocheton cumingianus, Croton consanguineus, Timonius appendiculatus, Gnetum gnemon, Dillenia philippinensis, Elaeocarpus leytensis, Litsea albayana, Nephelium mutabile, Sapium luzonicum, Wrightia laniti, Syzygium striatulum* and *Garcinia venolusa.*

The same confined occurrence in non-dipterocarp species, particularly almaciga (*Agathis philippinensis*), indicated that each of the 5 watersheds contains unique species composition. Moreover, Table 5 shows that there were species recorded as occurring in only one watershed and not in others. Confined occurrences of species rendered the forests in all 5 watersheds to be important in the conservation of the total diversity in SINP area. The Jaccard indices on similarity in composition of timber species in forests of the 5 watersheds are shown in Table 6. The Jaccard index ranged from 0.448 to 0.581, to an average of 0.528. This indicated that per pair of watersheds, only half the species of two watersheds are common to both. The need to protect each of the watersheds can be further enlightened if conservation of the associated dependent non-timber plants and fauna would be considered. The tapping of resins from apitong and almaciga, both shown here as confined to Taft and Can-avid Watersheds, respectively (Table 4), had been also considered an important factor for local communities to have interest in preserving the integrity their nearby forests.

Table 4. Frequency of species in trees 60 cm DBH or bigger, by transect or watershed

LOCAL NAME	LATIN NAME	Taft	Can-avid	Ba-sey	Suri-bao	Catu-big	Total
Tangile	*Shorea polysperma*	13	7	8	9	14	52
Mayapis	*Shorea squamata*	6	8	13		27	54
Almon	*Shorea almon*	2	1			6	9
Yakal	*Shorea astylosa*	2	1			5	8
Bagtikan	*Parashorea plicata*	2				22	24
mangasinoro	*Shorea philippinensis*	8					8
Yakal-kaliot	*Hopea malibato*	1					1
Apitong	*Dipterocarpus grandiflorus*		33			2	35
Hagakhak	*Dipterocarpus validus*					1	1
Dalingdingan	*Hopea foxworthyi*			1	1		2
Nato	*Palaquium luzoniense*		1	1		1	3
Bansalagin	*Mimusops parviflora*	2		2	3		7
Tiga	*Tristania micrantha*	2		3	1		6
Uakatan	*Pouteria velutina*	1		2	1		4
Malaruhat sapa	*Syzygium striatulum*	1			3	1	5
Salngan	*Blumeodendron philippinese*	1					1
Almaciga	*Agathis philippinensis*	4					4
Damol	*Hydnocarpus subfalcata*	1					1
Ulaian	*Lithocarpus llanosii*		1				1
Dungon	*Tarrieta sylvatica*		1				1
Lumangog	*Antirhea livida*			2			2
Hindang	*Myrica javanica*			1			1
Bahai	*Ormosia calavensis*			1			1
Patsaragon	*Syzygium crassibracteatum*				3		3
Tabau	*Lumnitzera littorea*				1		1
Dita	*Alstonia scholaris*				1		1
Banaybanay	*Radermachera pinnata*				1		1
Malakamanga	*Reinwardiodendron celebicum*				1		1
Balau	*Vaccinium perrigidum*				1		1
Toog	*Petersianthus quadrilatus*					2	2
Milipili	*Canarium hirsutum*					1	1
Bunsilak	*Elaeocarpus leytensis*					1	1
malugai	*Pometia pinnata*					1	1
Balakt gubat	*Sapium luzonicum*					1	1
	Total	**46**	**53**	**34**	**24**	**85**	**242**

Table 5. Frequency of individuals on timber species in the 5 watersheds, for trees with DBH of 10 cm and larger. SINP, 2012

Common Name	Latin Name	Taft	Can-avid	Ba-sey	Suri-bao	Catu-big	Total
Mayapis	*Shorea squamata*	59	92	79	8	77	315
Yakal-gisok	*Shorea gisok*	16	46	34	11	16	123
Tangile	*Shorea polysperma*	63	70	33	40	21	227
Dalingdingan	*Hopea foxworthyi*	37	27	38	29	1	132
Yakal-kaliot	*Hopea malibato*	35	35	14	34	2	120
Almon	*Shorea almon*	22	32	15	1	14	84
Yakal	*Shorea astylosa*	26	9	8	4	10	47

Table 5. Continuation

Common Name	Latin Name	Taf t	Can-avid	Ba-sey	Suri-bao	Catu -big	Total
Salngan	*Blumeodendron philippinense*	93	78	35	20	22	248
Uakatan	*Pouteria velutina*	24	21	59	64	1	169
Duguan	*Myristica philippinensis*	59	35	16	25	15	150
Kalipapa	*Vitex quinata*	77	34	17	18	3	149
Bitanghol	*Calophyllum blancoi*	32	40	24	21	2	119
Ulaian	*Lithocarpus llanosii*	28	17	15	32	4	96
Milipili	*Canarium hirsutum*	30	14	14	19	16	93
Duguan-malabai	*Myristica laxiflora*	18	24	34	7	5	88
Nato	*Palaquium luzoniense*	17	13	7	25	26	88
Banaybanay	*Radermachera pinnata*	33	4	18	5	1	61
malakamanga	*Reinwardiodendron celebicum*	11	9	10	20	4	54
Hindang	*Myrica javanica*	7	6	3	24	3	43
Lapnisan	*Polyalthia oblongofolia*	10	6	7	9	10	42
Tulanan	*Jossinia tulanan*	7	3	11	15	4	40
Apanang	*Neotrewia cumingii*	3	1	10	1	22	37
Diis	*Garcinia oligophlebia*	9	10	7	10	1	37
Babahian	*Memecylon sissilifolium*	4	7	10	7	2	30
Tamayuan	*Strombosia philippinensis*	8	8	1	1	9	27
Balukanag	*Chisocheton cumingianus*	10	1	2	1	4	18
Malatuba	*Croton consanguineus*	9	6	13	18		46
Upong-upong	*Timonius appendiculatus*	18	16	8	4		46
Bago	*Gnetum gnemon*	7	2	1	4		14
Katmon	*Dillenia philippinensis*	8	7	3		3	21
Bunsilak	*Elaeocarpus leytensis*	19	15	3		4	41
Arahan	*Litsea albayana*	10	6		6	3	25
Kapulasan	*Nephelium mutabile*	2	1		6	6	15
Balakat gubat	*Sapium luzonicum*	31	24		3	33	91
Lanete	*Wrightia laniti*	7	2		15	4	28
Malaruhat-sapa	*Syzygium striatulum*		63	25	65	24	177
Gatasan	*Garcinia venolusa*		3	2	1	1	7
Bansalagin	*Mimusops parviflora*	5		2	9	2	18
Gapas-gapas	*Camptostemon philippinense*	5		5	4	1	15
Kalingag	*Cinnamomum mercadoi*	1		1	9	1	12
Salak	*Elaeocarpus octopetalus*	1		3	1	1	6
Almaciga	*Agathis philippinensis*	5	2	4			11
Kamagong-bundok	*Diospyros montana*	2	5	4			11
Apitong	*Dipterocarpus grandiflorus*	1	144		4		149
Tiga	*Tristania micrantha*	14	6		1		21
Sudiang	*Ctenolophon philippinensis*	3	1		6		10
Marang	*Litsea perrottetii*	1	1		1		3
Bubunau	*Aglaia mirandae*	2	1		1		4
Kamagong	*Diospyros philippinensis*	6	1			1	8
Bagilumbang	*Aleurites trisperma*	1	1			1	3
Malatambis	*Syzygium hutchinsonii*		1	3	37		41
Dungon	*Tarrieta sylvatica*		2	3	10		15
Lamio	*Dracontomelon edule*		2	1	4		7
Sasalit	*Teijsmanniodendron ahernianum*		1	6		5	12
Malasantol	*Sandoricum vidalii*		3	2		3	8
Salingkugi	*Albizia saponaria*	1		1		6	8
Damol	*Hydnocarpus subfalcata*	5		1		9	15

Table 5. Continuation

Common Name	Latin Name	Taft	Can-avid	Ba-sey	Suri-bao	Catu-big	Total
Madbad	*Zantoxylum diabolicum*	1		9	3		13
Baganito	*Diospyros bulusanensis*			3	1	4	8
Bagtikan	*Parashorea plicata*	7			3	54	64
Patsaragon	*Syzygium crassibracteatum*	4			21	1	26
Aunasin	*Ardisia pyramidalis*	1			1	1	3
Malakauayan	*Podocarpus philippinensis*	2	1				3
Hindang	*Myrica javanica*	1	1				2
Balatbuaia	*Fagraea racemosa*	1		1			2
Hambabalud	*Neonauclea formicaria*	1		1			2
Bahai	*Ormosia calavensis*			10	1		11
Lumangog	*Antirhea livida*			5		1	6
Maglimokon	*Urophyllum leytense*	1				5	6
Palosapis	*Anisoptera thurifera*	3			1		4
Tulo	*Alphitonia philippinensis*	2			1		3
Manggasinoro	*Shorea philippinensis*	15					15
Bunud	*Knema mindanensis*	11					11
Malasapsap	*Ailanthus integrifolia*	7					7
Piling liitan	*Canarium luzonicum*	2					2
Ficus	*Ficus sp.*	2					2
Lanipga	*Toona philippinensis*	2					2
Anislag	*Securinega flexiousa*	1					1
Red lauan	*Shorea negrosensis*	1					1
Malabanaba	*Syzygium banaba*	1					1
Samar yagau	*Homalium samarense*	1					1
Tindalo	*Afzelia rhomboidea*		1				1
Tikoko	*Teijsmanniodendron pteropodium*			45			45
Kubi	*Artocarpus nitida*			3			3
Pili	*Canarium ovatum*			2			2
Panau	*Dipterocarpus gracilis*			1			1
Dao	*Dracontomelon dao*			1			1
Balau	*Vaccinium perrigidum*				61		61
Atipan	*Evodia sessilifiliola*				20		20
Burak	*Cyathocalyx apoensis*				10		10
Bobotan	*Tricospermum discolor*				8		8
Bagodilau	*Neonauclea puberula*				6		6
Dita	*Alstonia scholaris*				5		5
Kulatingan	*Pterospermum obliquum*				5		5
Bakawan gubat	*Caralla brachiata*				3		4
Dila-dila	*Cynometra inequifolia*				2		2
Tarungatau	*Evodia arborea*				2		2
Malanangka	*Parartocarpus papuanus*				1		1
Malaigit	*Cryptocarya oligocarpa*				1		1
Lipote	*Syzygium polycephaloides*				1		1
Kurong	*Claozylon pubescens*					16	16
Hagakhak	*Dipterocarpus validus*					10	10
Bagna	*Glochidion triandrum*					4	4
Toog	*Petersianthus quadrilatus*					3	3
Narra	*Pterocarpus indicus*					3	3
Paluai	*Greeniopsis multiflora*					2	2
Pipi	*Actinodaphne dolichophylla*					1	1
Fireball	*Calliandra haematocephala*					1	1
Malugai	*Pometia pinnata*					1	1
Ligas	*Semecarpus cuneiformis*					1	1
Sambulauan	*Syzygium albayense*					1	1
Banuyo	*Wallaceodendron celebicum*					1	1
	Total	**967**	**961**	**693**	**818**	**510**	**3,949**

Table 6. Jaccard similarity indices among transects. *Figures above the blanks on the diagonal were Jaccard indices and those below indicate the number of species occurring in both transects over the total number of species in two transects being compared.* Ave = 0.528. Range = 0.448 – 0.581

Watershed	Taft	Can-avid	Basey	Suribao	Catubig	No. of Species
Taft		0.581	0.448	0.558	0.472	71
Can-avid	46/78		0.555	0.573	0.513	50
Basey	42/86	40/72		0.519	0.563	57
Suribao	48/86	43/75	41/79		0.500	67
Catubig	42/89	38/74	40/71	40/80		63
Total of species	71	50	57	67	63	112

B. Species Composition

Vegetation data in the 125 plots, at 400-sq.m/ plot, taken in the 5 watersheds are shown in the vegetation table (Table 7 in Appendix). The whole inventory of species had recorded 308 species in the 5 watersheds, 260 were tree species and 48 were non-tree species. More non-tree species could have been listed but the difficulty to complete the identification, particularly for herbs, ferns and lianas, had been a limitation. The 308 species belong to 72 families and 181 genera. The vegetation table also showed the site range of species, such as the widespread species that occurred in most of the watersheds and the species with more confined distribution. By mere inspection of the vegetation table, it was quite clear that not only trees but also under-story and ground plants tend to have confined distribution in the watersheds.

CONCLUSION AND RECOMMENDATION

Based on the findings, the following conclusions and recommendations are forwarded:

1. The forests in SINP watersheds are dipterocarp forest with very high floral diversity. The species of the canopy layer has the highest contribution to overall diversity as compared to undergrowth and ground layer plants. This suggests the importance of protecting the forest from structural degradation.
2. The watersheds contain widespread species that are common to all. There are species, both timber and non-timber, that haveconfined distribution to certain watersheds. The occurrence of certain groups of species in only one of the watersheds indicates that forests in each of the watersheds are important to maintain the total floral diversity in the SINP.

3. Timber volume in SINP remains high but below the level that would justify commercial logging operations. The presence of many big trees has been shown to be important to the maintenance of diversity in the watersheds. Control of timber poaching in the area should be always desirable.
4. Local people can contribute to the protection of forest when they can derive economic benefits from it. Utilization of non-timber forest products, such as resin from almaciga in Taft and balau from apitong in Can-avid Watersheds may be encouraged. The species composition of areas cleared by charcoal making can not return through natural regeneration even in 100 years. Charcoal making in Taft should be stopped.
5. Possibilities for transport of sawn timber are associated with rate of timber poaching. Most interior barangays have no road connection and mobility depends on the feeder river. Deeper river water allows bigger boats and sale of lumber to downstream. communities. In fact, the transport limitation from interior barangays and the rugged terrain should have left this part of Samar Island to remain still forested. Therefore, road development plans particularly by the local government units should always be required to secure environmental compliance certificate from the DENR.
6. The study was able to establish benchmark data on timber structure and species composition of the 5 watersheds covered. A study with similar methodology also should be undertaken for the 3 other watersheds, such as the Dolores, Gandara and Pambujan Watersheds. This is to have a complete picture of the total floral diversity and forest structure in the entire SINP.

ACKNOWLEDGMENT

Word of appreciation for the funding provided by the UNDP-GEF in the conduct of the SIBP post-project biological resource assessment and to the courtesy of Forester Angelito Villanueva, the SINP Superintendent, during the conduct of the field work. The cooperation of Dr. Teofanes A. Patindol, the expert who handled the fauna, is also well appreciated.

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Appendix A:

Table 7. Vegetation table showing the frequency of occurrence of species in plots, their plot cover dominance at the tree layer, undergrowth layer and ground layer for all five transects. Percent canopy cover dominance scale: 5=75-100%, 4=50-75%, III=25-50%, B=15-25%, A=5-15%, M=<5%, over 50 individuals, 1=<5%, 6-50 individuals, +=<5%, 3-5 individuals and R=<5%, 1-2 individuals. See separate table for summary of constancy levels of species. SINP, Samar Island, Philippines. 2012. *This table was simplified by removing the species that occurred only in 3 or less plots. Unidentified species = 57*

PLOT NO.				1	1111111111111111111111111
	1111111111222222	2222333333333344444444445	5555555556666666666777777	7777888888888899999999990	0000000001111111111222222
	1234567890123456789012345	6789012345678901234567890	1234567890123456789012345	6789012345678901234567890	1234567890123456789012345
TRANSECT NO.	1111111111111111111111111	2222222222222222222222222	3333333333333333333333333	4444444444444444444444444	5555555555555555555555555
% Plot Cover	8886889887779767898897897	9998988988888888889988888	7767667776777888788887777	8877777787778787777777777	8888777877777788888888888
	0005550005500050550005505	5550055055505505550000505	5000555050050500500000005	0000000500500500505550505	0500550055555500000550000
Tree Layer, % Cover	2335332276255534132213333	6766767465547776787666767	5454444554555755565655665	5555455664546565655666556	6555555554554454655655544
	5000555000000505500550055	5050505505050005505000005	0557505005000055550055505	5505005500550055550055550	5505505005005505050500050
Undergrowth, % Cover	11313332123 2 1 443342241	2222322233333334333433444	4345443332234443434544443	4343334333333434434443343	2233231212111222321221223
	5250055550075105000505505	5505505555550050500005555	0500005005500505055055505	0505550555005555005055555	5550505050555005055005555
Ground Layer, % Cover	2513232424323423335554423	2222333333332233333333333	4433433233333443333233323	2242424234342324232433242	1233332222222223322222211
	5050555055550005050000055	5555000555505500000005000	0055000550500050050505055	5050505505505000550550550	5000000005000050050050055
Part of Slope	SLUUUUuuuuumllllullffffl L	fffffffffffffffffffffffff	llllll2lllllllllllfllllfl	fffffffffffffffffffffffff	llluluuuuulllluuuuuuuuuumm
	LSSSSSsssssssssssssssssS	sssssssssssssssssssssssss	ssssss0ssssssssssssssssss	sssssssssssssssssssssssss	sssssssssssssssssssssssss
Slope, degrees	3343656545525451323 3443	6411111111111112444141113	1122121211211222322111112	33223121 1212131312112111	2111222223113341111112332
	0050000005005000505555500	0055050055005555555555050	555550s555555000005000000	5550050000000550555555055 0	5550500050555500505550550
					1 1
Rock Cover, %				2	090
	0O00000001213010000000000	0000000000000001100000000	0001011101012100100000000	3320321001000002110100116	0000000000000000000000000
SPECIES AT TREE LAYER:					
Shorea polysperma	R.RRR.RR1A11+1.+++1...+A.	+.AAA+A+1+.A1..BAA.R1.M+R	M....A..AMMM..+ARA+11AA1A	........RA1+RA+R+A.A+AR1M	.+.1B+B....+.+..M.R.BR.+.
Shorea squamata	BAB..RR..R.M+++1...+1+..R	A11AA+.1+..A1.ABAA.R+AR.1	AM.AAAMAAAAAA..A..1...AAA	...R.....+...R.....+.+.RR	AAABBBAA1BAMR.R.B.+A1M...
Bruguiera parviflora	....R..RRRR.....1R+1R.RR.	..RR...RRRR.RR........+1.	R1RM1.RR1RA1RRARAA.MRAR+1	1R+A1+M+R1RR++R1R1.1R1RM.	R........................
Syzygium striatulum	RRRRR+R+RRRRR+R+RR+RRR+.+	++.RRRRRR+..R+R...R.+R++1	+R..+RR.R.R.RRR+M1.+R...R	1MRR1+RRRRRR+RR++.1RRRR++	..RR.R......R.R.+RR1..R1.
Blumeodendron philippinens	RR+.++1+1+1R++R+.+1++.+1+	11+.+++R..+.R.R+RR+1+RR.+	RRR.1MR.R+R1.R+...RR.R+R1	..++.R.R.+R..RRRR.....R.R	RRR.1RR..R.R.RR...RR.+...
Shorea gisok	R.....R..R.....+.R+R....+	RR+.+RRR....RRR.RR+++RRR+	R.R...1..1R1.RA.RRRRRR+R+	.+.R.R.R.RR...R.R.R..R..R	....RRR......+R..R+R.RR..
Lithocarpus llanosii	..R++1.R.R.....1+RRRR..RR	.......RRR..R..R...1..+R.	R.....R.........+R+.R.+R.	.RR.R..RRRRRRR+.R+..+RRR.	.........R.....+..R..R...
Myristica laxiflora	.....R..R.R.RRRRR..R.+R..	R+11.RRR.....R.RR.RR..R..	R11+1+1R.R.RR..+M.+..R..R	..1...........R...R...+.	R.R.R..R...R.....R..R....
Myristica philippinensis	.RRR..R.1.1.R..R.RR++R.R+	R...+R..RR..........+RRR.	...........+..R..1..R..+R	...R.1RRR..R.......RR...+	....R.R....R..R.RR.RR...+
Palaquim luzoniense	.......R.R.......R+R.R..RR	...+R..RR............R..R.	R+...RM....RRR...R.......	R..+.R1.R.R.....RR+.RRR.R	...RR.......R.........A+1
Canarium hirsutum	..RR..R+R+R..R.....+RRR.R	R+..RRRR.......RR.RR.R...	......R..1...R...R.RR.R.R	+R.RR......R.....R..+....	R..R.....R.RRRR..R...R...
Reinwardtiodendr.celebicum	R.......R.R...R..RRR.RRR.	...........R..R...R.RR.R.	R............+...RR......	.......RRRRR.R.R..RR..R1R	....R..R.....R.......R...
Polyalthia oblongifolia	.R....RRR.RR.RR.....+....	.R...R.....R........R...R	R........R...R.....R..R..	RR.RR..R...+.....R..R....	R....RR......R....R...RRR
Praravinia lucbanensis	...R.R.RR.R..........R...	...R...RR.....R..R....RRR	.+R...+...+..M.RRRR1+....	R.RR.R.R.......+...+.R.RR	.RR.....R.......R.R...R..
Shorea almon	.RR.R+..RR.R+++..........	R.1A1.+...AA+.A+.A+.R.+..	..+...+....R......+.++M1A	..............R..........	..+ARA.+.+.......M.B.....

Neotrewia cumingii	........R..........R...	.R.......................	..........R.....R..+RR..	................R.......	..R..RRR......+.RRRR.R1RR
Hydnocarpus subfalcata	R...R.R.......R.R........	....	...R....................	....	R....RR.R.R.......R.....R
Dillenia philippinensis	..R..R......RRR.........R	R....R.RR......R.........	+..............R...R...	....	..R.....R.....R..........
Strombosia philippinensis	...RR..RR.RR.R.R.......R.	...RR.R......R.......R...	....	....................R...	R......R......R.....RRR.R
Shorea astylosa	R..+R............+......	.......RR.1.........R.R.	............1.A.R.......	.....R.........R.....R.R	....................BM1
Myristica guatteriaefolia	..........R....+........	.........RR.R....R......	RR................1..R..	R...........R...........	R.......................
Cleisthanthus megacarpus	........R.RRRR........+..	R..R.....RRRR..RR...R..R.	..R...R.....R.R.........	....	...R......+R............
Radermachera pinnata	+1R..R.R.....R.....1.1RRR	RR..R........R...........	..+RR..R.R..R..R.+R++...R	.........RR............	.......................R
Hopea malibato	R.+RRR..RRR....R.....R.1+	.+R...R..RR.RR..R.R+.RRRR	.+.........++.1..RR+....	.RRRR....+RRRR+1+1R.R.R.R	.....R..................
Hopea foxworthyi	.RRR.RRR.R.R...+++R++RRRR	R.R.RR.R..R.R1RR....R..RR	++.RRRA..R.R1RA..+R+RR..R	RA.R.RR.R.R.R.RRR.R.+.RR.	....
Vitex quinata	R.RRR..A.1......1++++R+1R	.RR.+.R.++R..R.......R+RR	..RR...R..+..R..R..RR....	....R.RRR+..R.R...R..R...	.......R..........R.R...
Garcinia oligophlebia	......R.........RRRRR..R.	..RRR.....R.RR.R.......R.	...R.........R...RR.RR...	......RR...RRRR.RR...R...	R.......................
Calophyllum blancoi	.............R....R..+...	.....RR.R....RR1R....+1R1	RRRRR.RR1R.R..R...RRRR+.R	RR.RR.R.R.R.+.R+1RR+++R+.	....R.................R..
Jossinia tulanan	.RR.R....R.....R.........	R..R.R..................	....R..RR....R.R...R..R..	..R.R....R.R...R..R..RRR.	RR...R.................R
Memecylon sessilifolium	.....R+.................R	.R...R......R.R...R.R..R.	........+R+R.R..RR.....RR	.....R........R..R.....R+	........R.............R.
Croton consanguineus	........R..R......+...R.	.RRR.........R..........	......R...R..RR.....R.RRR	.R......+R.RRR.R.R.....R.	....
Camptostemon philippinense	.+R......R............R..	.........R.R...R....R+...	............R....RRR.RR..	..R...........R.R........	R.......................
Myrica javanica	R........R...+..........R	...+....R.....R........R.	....R......R1...........	......+.R....+.1.R.1.+.+.	.......R..RR..R..........
Syzygium crassibracteatum'	R..............1.R......	....	....	M1A....1...R..R++RR+.R.RR	....R...................
Wrightia laniti	.RR..........R........RRR	....R..................R.	....	RR.+.RRRRR.R.R.......R..R	..................R.R.R
Nephelium mutabile	........R.R..R...........	............R...........	....	.....R....R.R...R.......R	....
Mimusops parviflora	...............RR..R....	....	...R.........A..........	...R.AR.........R.R...R..	..R.....................
Gnetum gnemon	...R.R.........R........R	.R..................R....	....	......R..R......RR......	....
Ctenolophon philippinensis	........................R	....................R....	....	..R.R.R...R.............	....
Calophyllum blancoi	RRR..+R..R.+.......R..RRR	.RR.....................	....	....	....
Mussaenda sp	....R...........R...R....	..RR...R..R..............	R.......................	.......................R	....
Litsea albayense	..R....R.R......R..R..R.R	..........R.RR.......+...	....	.R.R.R..................	....
Shorea philippinensis	....RRRRRRR.............	....R...................	....	....	....
Chisocheton cumingianus	........R.R.RRR....R...R.	.....+..................	.............R....R.....	.........R..............	.R...RR....R............
Myristica philippinensis	....+R.R.R..............	.......................+	....	..R.............+.+......	....
Aquilasia sp.	....RM.R1A1.............	....	....	....	....
Neonauclea formicaria	......R.R.R.............	....	......R.................	....	....
Canarium hirsutum	.R.........R...R.......R.	............R...........	...............R.........	.......R.............R..	..+.RR..................
Dipterocarpus grandiflorus	....	AAAAMBAB11+.A1AABAA1MA1AA	....	....	.....A.............R+...
Timonius appendiculatus	.R.R+..R.R.R1..R...RRR.R.	.R.RRRRR...RRRR.R...R+R..	.....R...........R....RRR	.....R.R............R...	....
Sapium luzonicum	..R+..R.1R1RRRR..RR...R..	RRRRRRR...R....RR..R.R.R.	....	........R...........R..R.	....
Tristania micrantha	...R...............R..+RR	.......RR.............RRR	....+..+.......A1A.......	.......................R.	....
Diospyros montana	...R.R.....R...R........R	.......+...............RR	....+..........1+.......	....	....
Agathis philippinensis	....................+.1.	......................R.R.	..........+...R.R.....+..	....	....
Elaeocarpus octopetalus	...................R.....	....	...........R.....RR.....	.......R................	...........R............
Teij. pteropodum	....	....	RR.1.MRRRR+1RRR+..RR.R1.R	....	....
Xanthoste.n philippinensis	....	....	R..M.11+......R.....11...	A+..+...................	....
Diospyros bulusanensis	....	....	.......+.R...+..........	................R........	......................RR+
Xanthostemon philippi.nsis	....	....	......1............+...1R	R...................R....	....
Ormosia calavensis	....	....	.............1RM+.1.....	....R...................	....
Teijsmanniodendron ahernia	....	..R.....................	............R.+....RR....	....	...R.........RR...R......
Kolowratia elegans	....	....	....	R.+R++R1RR++RRR+R+.1+R+R.	....
Syzygium hutchinsonii'	....	.............R..........	...R..................RR	..+.M.+.R+.R.RR+.+.1RR...	....
Evodia sessilifoliola	....	....	....	..R......+.+.+.+.R.R.....	....
Vaccinium perrigidum	....	....	....	...+...R.AR1+1++RM+A11..+	....
Tarrietia sylvatica	....	..............R.........	.....R....1.............	R.....1...+.....RRR......	....
Cinnamomum mercadoi	....R...................	....	R.......................	...R.......RR.....R.R..RR	..R.....................
Cyathocalyx apoensis	....	....	....	.+.R.R.RR............R..	....
Dracontomelon edule	....	.R.......R..............	.......................R	.R...R..........R.....R.R	....

Trichospermum discolor	....	....	....	R.R.+....................	....
Alstonia scholaris	....	....	....	+R.1...............R....	....
Neonauclea puberula	....	....	....	...........R.R...+......	....
Pterospermum obliquum	....	....	....	............R.......R.R.	....
Parashorea plicata	......1......++..........	....	....	..R......................	R.+M1RRM1...ABB1ABBB.+...
Sapium luzonicum	....	....	....	....	R.R.R...RRRRR1R....++R...
Claoxylon pubescens	....	....	....	....	RR........R.+R+....RRR...
Licania splendens	...R.....................	....	....	....	.R....R.RRR.R...RR..R....
Urophyllum leytense	....	....	....	....	..R.........RR.........R
Greeniopsis multiflora	....	....	....	....	.......R...R.............
Albizia saponaria	....	....	....	....	........R...R.........R.R
Dipterocarpus validus	....	....	....	....	........RR1+.............
Nephelium mutabile	....	....	....	....	.........RRR+............
Hopea foxworthyi	....R........R...........	....	...............+.........	....R....................	.......................R.
Sandoricum vidalii	....	.........R..........R....	.+R......................	....	..............+...R.....R
Afzelia rhomboidea	....	..............R..........	....	....	...R...............+.....
Litsea albayense	....	....	....	....	..R.....R..............R.
Alstonia paucinerva	....	....	....	....	...+.R..................R
UNDERGROWTH LAYER:					
Mussaenda sp	R.R.......R.R..R....+.RR.	......R.R..+11..R...RR+R.	1.+.+...R................	...R...R.R1...+.1+R...R..	..RR.....................
Dillenia philippinensis	......R.....+R.....R.....	.........1....RR..+....R+	..R..+....R.....R.RR..+R.	.R...R..+R...RRR.R.......	.......++....R..R....R...
Polyalthia oblongifolia	........RR+.....R........	....RR......R.R.....R....	....R+..+.....R.RRR.R.R.R	...RRR.R+R..+R.R+R....+.+	R1.....RR.++++...++.....R
Myristica philippinensis	.........R.....+.........	R...R.R...R......R..+R.+.	........................R.	R.RR..R..R.+.R.RR..R.R..R	....R.......R.R..RR......
Ardisia pyramidalis	A+AA11.+RAR+1.RRM...+.+1R	+MAMM1MMM.AMMM.M11.MABM1M	1+A1.MM++MMM1M....+AAAMM1	....	..R..........R...R.......
Oncosperma tigillaria	..A..R..R..R1.1..1R++A.RR	1++M111.1+RR+R+++++.R...1	M+.11++111.1.1.1+....++.+	.R............R..........	1R...+.++..+..R..........
Calamus ornatus	11A..........+......1.1R	..........1M+.11.11.11.+	++++111M.M+1.11M1MMA1+++M	.1+++1.M.1.1+11+..A1M+111	1R.+..+..R.1+R1...++++...
Fagrea racemosa	...R..RR..R.........R+RR.	RR.R...R.R.RRR..R.....RR.	..+.R......R..R....R..R.R	.R....RR..+.+RRR......R..	...............R.........
Vitex quinata	...+1....R.R....M1..++R1R	.......RR+.1.........1R.R.	..........R..............	....R.R..+++.M.RRR...R...	....
Hopea malibato	R.R+R.RRR...1..+11M++R++.	R1+.......R.R+....+1.R.R+	+.+....R.+.+....+.....+..	++++.....RR++1MRR11+1....	....
Teijsmanniodendron ahernia	....R............+RR+....	.RR...RR+............R.R	R.R..........R..........R	RR.R...R..R....+...R....R.	....
Calophyllum blancoi	.....+.+..R+++...........	R+...RR+.R.R..RRR..++.R+R	.++++.+...R..+...++++..+.	++1.1.RR.+++11+1..++.+..+	....+....R..RRR.RR....R+.
Canarium hirsutum	......RRRRR+++RR.........	........+.R...RR..R+R+R..	.+.RRR..+.+R..++...+..R+.	..R.R+R+.R+R...R.R+R.R+++	..RR++.+..+.R.R+R+++.....
Lithocarpus llanosii	..R.R1.....1...+1AA1+.R..	+R...R..1R..............	R..+.........+......R....	.RR.R...+R.R.+.R.R...RR..	R...............R...R.....
Croton consanguineus	.......RRR......M.A.+.R1.	....R....+..R...R.......R	.....+...................	............RR..RR.......	...+...+...R..R..........
Flagellaria indica	...+.............+.+.....	+R.....RR.1+RR.RR.+R..+..	............R....R.....R+	+R.R.+.11...+.....+.+...1	........R............R....
Garcinia binucao	...++...............R.....	RR....+1.+....+....+..R..	.++.R.1+...............R.	..1.+.1..+++.1...1+.++R+.	R.......R+..............+R
Reinwardtiodend.celebicum	....RR.........R.........	....+.R...+.R.++.+.R.R+..	.....RR.R.RR.++.++.....R+	.R..............R..R.R...R	..R.........+RR.....R....
Shorea squamata	.R...+.....+11.....R.R..R	RR.++..+.+R.11..++M.1.+..	.R+.+..R.++++.....++..+..	....	+..+..++++.......+.......
Artocarpus blancoi	R........................	R........+..R............	.......R....R..........R.	+....R................RRRR+	R.R.R.RR.R.....R.........
Parashorea plicata	.....R+....+..+........R.	....	....	....	........+R....++.++.M+..R.
Shorea astylosa	+..+1++......R...........	....R..R1..1.........R...	....	....1..............R.....	.......................+..
Shorea gisok	....	...............R.....R...R	.............+...1...1...	R................R.R...R..	..............R..R.R..+..
Shorea polysperma	.....R.................R+.	...+.....1..........111..	................R..+..+...	.......R...R.....+.......	....
Shorea almon	......R.....1............	...............R.+1...+.1.	....	....R....................	....
Hopea foxworthyi	R......RRR....R.1........	.......R...R..........R+..	...............R..........	..+.......+.....+.1.+.....	....
Memecylon sessilifolium	.........R...............	.......R..R..............	...R......R............R.	............R............	....
Myristica laxiflora	..........+..............	..................R.......	.....R...........R.......	.R................R.......	.............R.....R.....
Agathis philippinensis	1...+R.R.......+M........	......................R.R.	.........R.........R...R.	....	....
Gnetum gnemon	...............+.........	........1.....R....+R....	...................R......	R..R...R+.R.....+.......+	....
Calliandra haematocephala	................R........	.......R.+.1R......R.....	....	.......RR..R....R........	...............R.........
Calophyllum blancoi	...................+......	..........R......R......R	......................R...	........R................	....
Neolitsea vidalii	...................R.....	.........R...R...........	....	.....R..RR.R+..R.........R	....

Cratoxylum celebicum	R.....R..................	......R.R................	....	.....R...................	....
Myrica javanica	..........R..............	.........R............1.R	....	....	................RR.......
Elaeocarpus octopetalus	....	..............+++++......	....	....	....
Dipterocarpus grandiflorus	....	RMMMM.M1R.M1.1M1M11111111	....	....	...................R.....
Zysygium	...+.......+.......R.....	.1A...++1.1M11+111.1..1.+	....	....	....
Dipterocarpus gracilis	...........R.............	...RRRR.R.....R.RRR..R...	..R......................	....	......................R..
Diospyros montana	................R........	.R.RR.R....R...R...R....R	..R.R....................	....	....
Blumeodendron philippinens	................M........	R....+R.....R....+.+RR...	.R.+.++...+.......R......	....	.............R...........
Bruguiera parviflora	+........................	.............R........RR.	....R+.+++.11.+++..RR.+R+	..++++R..1+1+++1+1++++.1+	.......R.................
Dinochloa scandens	....	.....R...R...R+..R.R....R	++M+++11+.11+M+1++1..++.+	11RMRR.1+.....+++.+.+.+.M	+.R+R......+RR+R++R.R....
Syzygium striatulum	..........R..............	..............R...R..R.R.	.R...............R.R.....	.R..R.RR.R...R..R........	..R..........R....R......
Areca cathecu	.......R..+....+.........	....	++1.R11111+11++.M1++.++++	.+..+1+.+1+++.R+..+1.++1R	....
Jossinia tulanan	....	....	R.....R.RR...R...........	RR.R................+.R..	...R...R....RRR...RR....+
Freycenetia multiflora	....+.............+......	.R.......................	+..1..+111MM11+M+.M11+M11	.....+...+M.....1.+.+R..1	...+.....1............1..
Pseudopinanga insignis	........R................	....	++.AMM11M1+11111+1++11.1.	+.RR+1..............R...R	....+.+..............+...
Ulalapay	....	....	..R.+.+.+R+R1++++++++1++R	.....+................++.	....
Syzygium hutchinsonii	....	....	...R.++..RRRR..R..R....R.	++..RRR.+..+.R+++R+R..+..	...................R.....
Syzygium garciae	....	....	R....+..+..R.R...+.......	....	....
Teijsmanniodend.pteropodum	....	....	...+1+1..11+M.R+...+.1R..	........R................	....
Xanthostemon philippinensi	....	....	.........R....R+.R.......	...R1.................+..	....
Livistonia rotundifolia	....	....	...+...1......1..........	....	.R......R................
Diospyros bulusanensis	....	....	.....R.......R.R.........	....	.....R..................1
Dicranopteris linearis	....	....	...........1.........1.++	....	....
Psychotria rubiginosa	....	....	............R..R.R..RR...	....	R...............R......R.
Wrightia laniti	.R.+R.R....RRR...+R....R.	....R....................	....	RR....R..R.R.......R.....	........................+
Palaquim luzoniense	.........R.....RR........	.........R..........R..+.	..R......................	RR..R.R..R...R...R...R.R.	....
Pandanus luzoniensis	.+..+R....+.....1........	....	.............M......1....	1+RR....++R+.+R.R..1+++A+	................+.......R
Syzygium crassibracteatum'	....	....	....	M11M.1+++...M...M..+..MRM	....
Cinnamomum mercadoi	..................R.+....	....	.................R.......	R........R.+..++++.++..+R	....
Pterospermum obliquum	....	....	....	R..........RRR.....R.....	....
Vaccinium perrigidum	....	....	....	.......R.+.R.+R1.+R+++...	....
Homalium samarense	....	....	....	..........R.R.R...+.R....	....
Podocarpus philippinensis'	....	....	....	...R.+..+.1R+.+.R...R....	....
Melastoma	........................R	....	....	....R.R......+......R..1.	....
Cyathea contaminans	....................AR...	....	....	.....R.R+RRR....1...+.+..	....
Karagbak	....	....	....	.....+.R...R.R.R....+...R	....
Dracontomelon edule	R........................	....	....	....++...R.....R.........	....
Cynometra inaequifolia	....	....	....	..+R+..R.................	....
Neotrewia cumingii	R........................	..R..R...................	......R..................	....	.+.+++AM.11..+++11++11MA1
Canarium calophyllum	....	+.R.....R.......R.R......	....	....	RRR.RR.+....R...RRRR.+...
Chisocheton cumingianus	.......R.RR..............	.................R.......	....	R..R.....................	...+++R..+....+R.....+1..
Nephelium mutabile	.............+..........R	....	....	....	.1+.+..+RR.........R.R...
Sapium luzonicum	....	....	....	....	R......+....RR.+11+RR+...
Areca cathecu	R........................	....	....	...R.....................	.A.+...++.+....+R.++++...
Musa textilis	......R..................	....	.......R....R............	....	R.......RR....+RR........
Strombosia philippinensis'	...................R.....	....R....................	+R.......................	....	+..+.+...R..+...+.+....++
Phrynium philippinensis	....	....	....	....	....+1.....1..MM...+.....
Malacacao	....	....	....	....	.......R...R..R.RR.RR....
Koordersiodendron pinnatum	....	....	....	....	.....+.R.RR....R.........
Hydnocarpus subfalcata	....	....	....	....	R......+....++...RR......
Dysoxylum decandrum	....	....	....	....	.R......R........RR......
Combretodend.quadrialatum	....	....	....	....	..............RRR.+......
Pometia pinnata	....	....	....	....	.RR.................++...
Neonauclea	.................R.+.RR..	+R.1.....................	....	....	+R..R...R................
Syzygium polycephaloides	.................+.R.A.R1	....	....	...R.....................	....
Canarium asperum	...R...............+.1.RR	....	....	....	....

Tristania micrantha	.....................R.+R	.R.................R..R.	R........................	...................R....	....
Alseodaphne malabonga	**.+.++A..R................**	....	....	**..M.....................**	....
Timonius appendiculatus	.........R.....1+........	....	....	.....M+................R.	..................R......
Garcinia oligophlebia	..........R.....R........	..............R..........	......+...............R.	....	.....+...................
Radermachera pinnata	...R.....................	...................R....	....	....	...+.........R........+.
Nephelium mutabile	....	R........................	............R............	..+......+.........+.R...	....
Dracontomelon dao	....	.........R...............	......................R.	....	......................RR.
Ctenolophon philippinensis	....	...........R.............	.+.......................	.................R.....+	....
Diospyros philippinensis	....	....	.RR+.....................	....	R........................
Albizia lebbek	....	....	.....R...................	........R................	..........RR.............
GROUND LAYER:					
Calamus ornatus	.A1A.A.31..M.R111+.+..A1+	+AMAM1MMM.A1MMM1++1MBMMMM	RM1M1MAM1MMAMMAAMMMMMAAMA	1M1M+11M.A1AMA11M1A1BMM1M	+.++11..+++1+++++M+111..
Nicolaia speciosa	11+1++.R.R++++1.+..+R1.11	++111111+A+R+.++++111+.+1	+++.+1+.+1.+..+..++..+++.	++1++.++++R..1..+1..+1+.+	++1+M+++++++R+.1R.++R1...
Ardisia pyramidalis	AMMAA1111AR+...AM1++.+M11	11MMM1MM.RMM.1.+1.11A111+	11M1+.M+.+.1.M.+...1M1.1+	................+...+R..+	..R...........RRRRR.....
Wrightia laniti	.+.++++....RRRRRR1.+1+++R	.R....RR.RRRRR+....+.....	..+R...R...R..R......R.R.	...R..R.....R..R...R..RRR	..........R...R....RR...R
Reinwardtiodend.celebicum	R+.R....RR.RR..R+.R.RR+1R	.+RR..+R+++++++R+1.+R....	R.R...+.RR+RR.+++++..R1.+	+.RRRR.R+.+....R+R+++.+++	..........R......R+.R...
Calophyllum blancoi	.R+R.+1RRR1++++R+++1+..+R	+RRR1R++.R+RR++R.+R+++.+R	R.++++.++.RR.+1+11++1.1++	+11M+++...11.+.1++++++1R+	....R.R..RR.......RR...+.
Canarium hirsutum	..R....R.R.+++.R..R..++.+	1RR++++R+++R+.+..RR.R++.+	R++.+.++.+++RR+..++....1+	++....R++R+R.R+R+R+R.+.+.	R...+R+.+....+RR+..+.R...
Scleria scrobiculata	11.111BRR.++.1.+1+..+....	++.R++.R.......+.+.+11+A+	.++...........R..+RRR..R.	..+R+.+.+..1.+.+.+.+.1...	..............R..........
Neolitsea vidalii	....R........R.......RR1R	...R....R+......R........	RR....R...R.R.R..........	..RR....+R+R++.RRR.R.....	+R....R.R.R...........R..
Lithocarpus llanosii	....+1....R+1.+.M1M+1.111	R+.+++.R.........R.......	..R+R.++++R++.+...R..RRR.	...R...RRRRR+R...R.......	.............R...R.R.....
Pandanus luzoniensis	M+.....R.+.MM11..+AABA.1.	111+1+111.1.+.+++.11RR.R+	+......1..1..1.1.11...+..	+.R......+.+.1.+...1..+1.	1..+..+.R......1.+++...++
Pandanus sp	..+.....R.......+........	............R...+..+..+..	+1+1+1M1.1.+.1MMM.1R+11..	...R............R...R....	.1M+A+RMAB.A11+1+1R+1....
Vitex quinata	1..+...RRR+....+.1+1++RR.	.......R...1.R.......1+R.	.........RRR+....11...R..	...RR.R.R1R+.++..+.R.R...	..............RR.....RR..
Phrynium philippinensis	.1........R.+1A....1.M1..	AAMM11.R+M1.111+1.11B.11.	1+.11111M1.1.1.1111..1+.1	....+.++.+...........++.	....+A..11........+.+....
Fagrea racemosa	...+R+.R...+.R.R..++++...	.R.R..R.R.R..+.....RR.R.R	....R............R.R.R..	.RR.....R..R.RRR.........	.....R.........RR........
Garcinia binucao	...R+......R++1..+1++..+.	R++1+R+1+++++++R++.+++R1+	R+RRR.+1+.+++++++++.+R+++R	+R++++R..R.1+++1++.++1R++	+RR+..RRR.1R......R..1...
Myristica philippinensis	........R.R....1.....RR..	1R....+R.R+R+.R.R.R..RRR.	....R+.R..+R.R....R..R.RR	......+R.+R+.1RR.R+R.R...	..........R......RR......
Shorea squamata	.R..++...R+++1R......R...	+............+.+1..+....	+1++..R1111+.......+R11++	....	1+..+...++++....+..++....
Mussaenda sp	+..................+R+R.	...+..R R.R.+R1..R...R.+..	+.+R+.R..R.R.RR..R.....RR	.R...R..+R+.+.+.........R	....
Ficus sp	............+..R......RRR	.R....R.R....RR.R..R..+.R	.R.......RRR......R.R....	...R...R..R....R...R.R.R..	..R......................
Freycenetia multiflora	M1..11.......+1..1MAA.1M1	..................R......	M111+11111.111+11.1111+.1	1++++.+++++++1+++R+R+++R+	+.1..+1.1..+R+..+...1.M..
Palaquim luzoniense	..................+R.+.R	....R..RR.RR.............	............RR..RR.....R.	..R.RRR.+.R...R....R....R	....................RR.R.
Dysoxylum arborescens	..+.........1+........R..	+RR..R....R..............	......................R....	.R.R................R.R..	........+..R...R.R.R+1R+.
Shorea polysperma	.R.+R.....+11.R1.R....R1+	.........1........+.+1++1	R.............+..+......	R......1....+.+.+R.....R+	.R.......................
Hopea malibato	...++1RR.......M.1+..+R+1	R+....+R+..R.+R...+1...R.	+.1....+....++1+1+1...+..	++++R+...+.++11+1+1+M++R+	....
Hopea foxworthyi	..............RR.........	.......R..R..R.R.....RR.R	...R.R...............R...	..R......+R....R.R.+...R.	....
Myristica laxiflora	.......RRR......R.R......	.R....R.....R...R.R......	.+.R..RR...1..R.RR.......	....	................RR......
Diospyros philippinensis	.....................R...	R..+........R...........R	R..RR+R+.R..+R.....R...RR	....	+................R.....R
Dracontomelon dao	.....................R..	.RR.R.....R...R.R.......R	....R......R.R.RRR.....1.	....	...........R.RRRR.R......
Oncosperma tigillaria	......+...........1.+R.1	1+..R..R+.+.....R.+....R.	....1....................	....	...........+R...........
Flagellaria indica	+...............+.......	1.R....R...+...++.R......	R..R.............R.......	.......1..R.....+...+...+	.....................R...
Dipterocarpus grandiflorus	....	.1M1MAA11.M1M+1AM1111A1+1	....	....	....
Dipterocarpus gracilis	...........R.............	..R.RR....R..R..R.R.RR.R.	.R.......................	....	....
Zysygium	...1............R.......	.11++.+1R.MM111111M1..1.+	....	....	....R....................
Elaeocarpus octopetalus	....	......+R++RRR.++.++.RR..+	....R....................	....	....
Canarium calophyllum	.................R..+....	R...RRRR..R.......R......	..........+.+...........	....	+.+....+.+..RRR+R+...R...
Tristania micrantha	................+....1+11	R......R.................	..R.........+....R.....R.	....	R........................
Agathis philippinensis	1R.+.............11R1.11.	.....................R...	R...R.................R.	....	....
Pentacme contorta	............R...........	....	....	....	....
Neonauclea	...+1.+....R......RR+RR+R	...+R....................	....	....	R........................
Shorea astylosa	1...1.+..R...............	...R....1..R.........R...	.............1.R.........	....+..............RR...	....
Shorea philippinensis	.......+R................	..R......................	....	....	....
Shorea almon	....	...........R....1...1.+.	R........................	....R....................	....

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³ Neonauclea sp            ³ ........................  ........+...+.R..R......  ........................  R.......................  ........................ ³
³ Dillenia philippinensis  ³ R.......................  ..R...........R......R.  .............R..........  .................R......  .........R......R....... ³
³ Litsea albayense         ³ R.......................  ............RR.....R....  ........................  ........................  ........................ ³
³ Blumeodendron philippinens .R.....RRR..............  ......+......R.R..RR....R  ...+R++.+..+............  ........................  ...R...R........+.R...... ³
³ Croton consanguineus     ³ ..................+....1+  .........R..R.R.........  ...+..R.................  ........+.+..R..........  ........................ ³
³ Diospyros montana        ³ ...R.........R..........  ..R..R.R.....R..........  .R.RR................RR..  ........................  ........................ ³
³ Gnetum gnemon            ³ ......R.................  ........1...+...........  ........................  .+......................  ........................ ³
³ Cleisthanthus megacarpus ³ ..........R.............  .R....R...R.............  RR..........R....R......  ..........R.............  ........................ ³
³ Clausena anisumolens     ³ ........................  ........R....R.....R....R  ........................  ........................  .....................R11 ³
³ Carallia brachiata       ³ ..................+1...++  ........................  ........................  ........................  ........................ ³
³ Cratoxylum formosum      ³ ...........+.....R......R  ...R....................  ........................  ........................  ........................ ³
³ Melastoma                ³ .++RR.+......RR.R...R+..R  ...................R.....  ........................  ........................  ........................ ³
³ Agathis philippinensis   ³ ....+..........A.....+..+  ........................  ........................  ........................  ........................ ³
³ Palaquium foxworthyi     ³ .+11+..................++  ........................  ........................  ........................  ........................ ³
³ Schizostachym diffusum   ³ ++...+.....+.+..........  ........................  ........................  ........................  ........................ ³
³ Calamus ornatus          ³ R...A.A..A1.A...........  ........................  ........................  ........................  ........................ ³
³ Alseodaphne malabonga    ³ .1.1.A1.....+....++.+....  ........................  ........................  ........................  ........................ ³
³ Phrynium philippinensis  ³ ..1..+1.R..1............  ........................  ........................  ........................  ..........1............. ³
³ Diospyros pilosanthera   ³ ..+...1.......R..+1++....  ........................  ........................  ........................  ......................+.. ³
³ Calophyllum lancifolium  ³ ....+...........R1RR.R..  .R......................  ..........R.............  ............R.R.+.R......  ........................ ³
³ Areca cathecu            ³ +......R.+......1.......  .....+.............11.+.  ..+.....................  ..A.1++1R1R1R1.+R+.1.1.1.  ........................ ³
³ Cinnamomum mercadoi      ³ ...R..............R.+..R.  ......................R..R  .............R...R.......  ..R....R+++++++++1.+++R1+  ........................ ³
³ Syzygium striatulum      ³ ........R.......R........  ...........R...R.RR.R...R  ....................R...R  .RRRR.R....RRR.R.......RR  ........................ ³
³ Melastoma sp             ³ ........R.R.............  .......................RRR.  .R......R...............  ..RR..R..R+R.R.+.R.RR..R.  ........................ ³
³ Teijsmanniodendron ahernia ....R.R.....+....R.RR....  ......................R..  ..R.......R.R....RR...R..  .R.R....R.+.....R......R.  .......R......R......R... ³
³ Dillenia philippinensis  ³ ..........+++..R...R...+  .............R.........R  .+...+..R.R.R.R...RR.R++.  +........R...R.R......+RR  +....R.RR......R.R....... ³
³ Strombosia philippinensis³ ................+R..R...  ........R..R............  .R......RR.R.R..R........  ....R...................  .11+++A11.++..+...+.1.+.1 ³
³ Diospyros bulusanensis   ³ ..........R.............  ...................R....  .......+RR...RRMM..R++.R.  +.+......R.........+.....  +...+.........R........11 ³
³ Shorea gisok             ³ ........................  ..+.............R........  .R+..+..RR+R.RR.1++1+.+.+  R+.R.+.+....R.R.+...R.R..  .......R....R...R....R..R ³
³³ Bruguiera parviflora    ³ ........................  ...........R....R....+..  R+1+R.111M111+1+1+1+++11+  1+R+.1R++1.1+1++.M+++++++  ........................
³ Tristania micrantha      ³ .................R......  ........RR..RRRR.RR......  ..R.RR.R....R.R1....R....  ...R.R........R.R...R...R  ........................ ³
³ Calliandra haematocephala' ...+....R...............  .......+R+.1+R..........  ..R.R.......R...........R.  ..R....++RRR.R..+.RR.....  ............R..M........ ³
³ Garcinia oligophlebia    ³ .......R.R..............  ..R+RR.RRR..RRR....R....R  +...RRR.+......+.R+R..R...  .....RR...R...R.........R  ....+..RR.....R...RR..... ³
³ Dinochloa scandens       ³ ............+..RR....+...  ..RRRRR..R..++RR++R.RRRRR  ++1+++11111.R++1..+...+1+  M1R+R+RM.+.+.R.R+R+R1...+  R...R....R.R++RR++R++R... ³
³ Artocarpus blancoi       ³ ..................+......  ...R..R.R+.R.R.RRR.......  ....RR.RR.....R+.R+..+R..  +.R...RR+R...+.RRRRR.R.R1  RR.R.....R+R..RR...R..... ³
³ Polyalthia oblongifolia  ³ .......+..R.............  .........R........RRR...R  R..+..1..R.R++...+RR.RRR.  RR..R....RRR.R.R.R......+  .1++++.1.+.+....R.....+.R ³
³ Podocarpus philippinensis' .................1+......  .................R.R....R  R.+R..R.R.R...R..RR....RR  RR+1R+R1MRA+1.M+.R+R1.MRR  R.R.........+R+...+...... ³
 Nephelium mutabile        ³ ........R...............  ........................  .+..RRR..R.....RR..RRR.RR  R.+.R.R..R.R.R...R.R.R.+.  ........................ ³
³ Syzygium hutchinsonii    ³ ........................  ....................RR.R.  .......RRRRRRR..RR.R..R.R  ...RRRR+.+.+MRM1++++.+.RR  ........................ ³
³ Ficus heteropleura       ³ ........................  ........................  ++R+R++1+R.R.R++++++..RRR  ++...+.+....R...R.....R.R  ......R...........+...... ³
³ Teijsmanniodend.pteropodum³........................  ........................  +1.11+1.++1.1.1+++.+..R..  R...R...................  ........................
³ Dendrocalamus merrillianus ........................  ........................  R..R.....RR.RR.+.R.R..R.R  ......R.................  ........................ ³
³ Syzygium garciae           ........................  ........................  ...+++++++RR.+.R.....+...  ........+...............  R.R..................... ³
³ Leucaena leucocephala    ³ ........................  ........................  ...R......RR.......RR.R..  ........................  ........................ ³
³ Jossinia tulanan         ³ ........................  ........................  ......R....R.RR.RR.R.R...  .......R........R.R......  R.......R............... ³
³ Leucosyke capitellata    ³ ........................  ........................  ........+..R...R.........  R.......................  ........................ ³
³ Ficus nota               ³ ........................  ........................  ........+..RR..R..R......  ........................  ........................ ³
³ Dicranopteris linearis   ³ ........................  ........................  ...........M.........+.R+  ............+...........  ........................ ³
³ Urophyllum leytense      ³ ........................  ........................  ...........R.......RR...R  .....R..................  ........................ ³
³ Tristania decorticata    ³ ........................  ........................  ..............RRR..RRR...  .......+R.....R..........  ........................ ³
³ Lycodium circinatum      ³ ........................  ........................  ...............RRRR.....R  .RR+R+............+....R.  ........................ ³
³ Cyathea contaminans      ³ ....................R.R..  ........................  ........................  ...........R.....R+......  ........................ ³
³ Bredelia pinangiana      ³ ....................R....  .RR.....................  ..........R..............  .....R.RR.........R......  ........................ ³
³ Pterospermum obliquum    ³ ........................  ........................  .....R..................  ...R+.........RR..R...R+.  ........................ ³
³ Afzelia rhomboidea       ³ ........................  ........................  ......R........RR.........  ..R.R...R...+.....+..R...  ........................ ³
³ Cynometra inaequifolia   ³ ........................  ........................  ...................RR.R.R  ..R.R...............R...  ........................ ³
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Syzygium crassibracteatum'	....	....	....	M1+1.1.+1.1.1.1+M.1.1.M+M	....
Evodia sessilifoliola	....	....	....	R..R........+.R..R.R...R	....
Vitex turczaninowii	....	....	....	+.R.R.................R...	....
Dracontomelon edule	....	....	....	....R.+....R...R...R.R...	....
Vaccinium perrigidum	....	....	....	.....+.R.+.+.1.1++++.1...	....
Donnax cannaeformis	....	....	....+....................	....	AB3B111MBMAB+.AAM.11BA...
Parashorea plicata	........R...1A1..........	R+.......................	....	....	R.11M1M+...+BBM.1M1BM1...
Nephelium mutabile	............111..........	+R.......................	....	....	+..R1R+++.1.R.R.RRR...R+.
Chisocheton pentandrus	.+.......................	RR.......................	....	....	..+..R1R+.+.......R.+...R
Livistonia rotundifolia	.+R..........R..........	..R......................	+.........R.+.11....R1...	....	R.+1+.A1A...+1+.R1..1A...
Tabernaemontana pandacaque	...R...............R.....	....	....	.R.......................	.R....R..R.....R.R......R
Hydnocarpus subfalcata	................R........	....	....	....	...RRRR....R+......R.....
Litsea sebifera	....................+....	.R.......................	....	....	R...+...R....R.R...RRRR..
Neotrewia cumingii	....	.R...R...................	....R....R...............	....	...+.R.1111+R+...1+.1M11.
Pseudopinanga insignis	....	....	+...M....................	.+.......R...............	......1++R1+R....+.++...R
Psychotria rubiginosa	....	....	...................R.....	....	..RR.....R...............R
Pometia pinnata	....	....	....	....	+.R+...+....R.......R++..
Dysoxylum decandrum	....	R........................	....	....	+R..+..R....R.....R......
Toona calantas	....................R....	....	....	....	RR.......R..........+....
Combretodend.quadrialatum	....	....	....	....	..R.R..R.R..+R.R++1......
Goniothalamus amuyon	....	....	....	....	..1...RR.R+R.....RR.R....
Canarium asperum	.+1................RRR...	....	....	....	...R....+....+RR.........
Musa textilis	.+....R.......1..........	...R...................+	........R................	....	...RRR.....R....R...+....
Chisocheton cumingianus	....	........................R	....	..........R......R......R	.+....RR+.......++.......
Syzygium calubcob	....	....	....	....	......R...+R...RR.RRRR...
Canthium monstrusom	....	..R......................	....	....	.......+.+.R...R....R+....
Alphonsea arborea	....	....	....	....	+..........R.........RR...
Angelica flava	.++.R.R....+RR.....R.....	....	....	....	.+..+.+..................
Cryptocarya oligocarpa	...............R.........	....	...................R..R.	.R.......................	.R.+.RR..................
Parartocarpus venenosus	....	....	....	........+............R...	R.R.R.R..................
Litsea albayense	....	....	....	....	.R.......R.+.............
Pelantos sp	....	....	....	....	.....R+R.................
Pygeum vulgare	...R...............R.....	....	....	....	...........R.........RR...
Sapium luzonicum	....	..R......................	....	....	..............RR.++.......
Semecarpus cuneiformis	...................R.....	....	....	....	......................R11
Areca cathecu	....	....	....	....	..++.................R+.
Caryota cumingii	........R...RRR..........	....	....	....	....
Aleurites trisperma	...............R........R	....R....R...............R	.........R.R.............	....	....
Calophyllum inophyllum	.................++R.....	....	....	....	....
Diospyros parva	...R.......+R....+..R....	.R.......................	....	....	......................R...
Symplocos villarii	.....R.....R........RR...	..+......................	....	....	.........R+..............
Albizia saponaria	..+......................	....	....	....	......+...............+1
Anisoptera thurifera	......R.........R...R....	R........................	...RR....................	....	....R....................
Dysoxylum altissimum	............+++..........	....	....	....	....
Terminalia foetidissima	.................R.R+....	....	....	..........R.R............	....................R....
Albizia lebbek	....	....	.....R................R..	.+.......................	..............R...R......
Xanthostemon philippinensis	....	....	.....R............R...R..	+......R.................	....
Garcinia venulosa	....	...........R.............	........RR........RR.....	....	....