Memo

MEMORANDUM ECD-PAD-25-058

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THRU : **MARY ANN R. TORRES**
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SUBJECT : **BIOMASS AND CARBON STOCK ASSESSMENT ON FOUR (4) SITES AT THE SUBIC BAY FREEPORT FOREST**
A submission to the 2025 Biodiversity Convention

DATE : May 26, 2025

Good day!

The Subic Bay Freeport (SBF) forest is known as one of the last remaining old growth forests in Central Luzon. However, studies on the SBF forest diversity, biomass, and carbon stock have been scarce. Therefore, this study was conducted to assess the diversity, biomass, and carbon sequestration assessment of 4 sites inside the SBF forest. Eight (8) circular plots were established where community structure, diversity, biomass, and carbon stock were assessed. The community structure was described using species richness and composition, and species importance value; diversity analysis was conducted by computing for the diversity index while biomass and carbon stock were assessed using allometric models. A total of 373 individual trees were assessed belonging to 67 species where 48 species were successfully identified representing 26 families. The most well-represented family was the Dipterocarpaceae. White Lauan (*Shorea contorta* S. Vidal) was found to be the species with the highest importance value. From the 4 sites, SBF forest falls under the “Very High” diversity category in accordance with the categorization of Fernando (1998). The total biomass of the 4 sites was 51.569kg m^{-2} and a total carbon of 24.237kgC m^{-2}, a total CO_2 sequestration of 88.952kgCO_2 m^{-2}, a total C sequestration rate of 5.993kg m^{-2} yr^{-1} and a total CO_2 sequestration rate of 21.996kg m^{-2} yr^{-1}. With such, the SBF forest should remain protected to further enhance, as well as for it to maintain its ability as a carbon sink.

Attached to this is the complete article for your comments, recommendations, and/or approval.

Thank you.

Report

BIOMASS AND CARBON STOCK ASSESSMENT ON FOUR (4) SITES AT THE SUBIC BAY FREEPORT FOREST

Subic Bay's forest diversity monitoring for 2025 was conducted on 4 sites where 2 circular plots were established on each site. Each circular plot had an area of 1,256.637m^2 totalling to 2,513.274m^2 per monitoring site. Table 1 shows the monitoring dates, monitoring sites, plots, plot area in m^2, elevation of each plot in meters above sea level (masl), and GPS coordinates of each plot. Note that the coordinates as well as the elevation was taken using the free version of the application GPS Camera 55 on an iPhone 11.

Table 1. Forest diversity monitoring sites for 2025

Location	Date	Sampling Plot	Latitude	Longitude	Elevation (in masl)	Plot Area)in m^2)
Hill 394	**March 14, 2025**	**HA**	14.76867	120.31974	257	1,256.637
		HB	14.76887	120.31989	252	1,256.637
Apaliin	**March 21, 2025**	**AA**	14.76902	120.28593	131	1,256.637
		AB	14.76861	120.28671	125	1,256.637
Pamulaklakin	**March 28, 2025**	**PA**	Unable to collect data due to satellite detection error			1,256.637
		PB				1,256.637
El Kabayo	**April 25, 2025**	**EA**	14.79655	120.31895	77	1,256.637
		EB	14.79658	120.31794	79	1,256.637
					Total Area Monitored (in m^2)	10,053.096

In each monitoring, tree species, diameter at breast height (DBH), and merchantable height (MH) were recorded. Take note that only trees with DBH of 10cm and up were recorded. Tree species were identified using Fernando *et al* (2004), Fernando *et al* (2018), and other online sources as referenced. Additionally, the conservation status of the species identified was taken using the IUCN Red List of Threatened Species as available on their website and DENR Administrative Order (DAO) 2017-11.

The community structure was described and assessed by getting the frequency, density, dominance, relative density, relative dominance, relative frequency, and species importance value. Table 2 summarizes the formulas used to describe the community structure.

Table 2. Summary of formulas used to describe the community structure of the terrestrial forest

No	Parameter	Formula
1	Frequency (F)	$F = \frac{\text{no. of sites in which each species occur}}{\text{total number of sites examined}}$
2	Relative Frequency (RF)	$RF = (F / \text{total frequency value of all species}) * 100$
3	Density (D)	$D = \frac{\text{total number of individuals per species}}{\text{total area sampled}}$
4	Relative Density (RD)	$RD = (D \text{ per species} / \text{total D of all species}) * 100$
5	Dominance (Dm)	$Dm = \frac{\text{area covered per species}}{\text{total area covered by all species}}$
6	Relative Dominance (RDm)	$RDm = (Dm \text{ of each species} / \text{total Dm of all species}) * 100$
7	Species Importance Value (SIV)	$SIV = (RF + RD + RDm) / 3$
8	Basal Area	$BA = 0.7854D^2$

Diversity analysis was done by following the study of Pototan *et al*. (2021) where Shannon-Weiner Diversity Index, Pielou's index of Evenness, Simpson's Index of Dominance, and Effective Number of Species were computed. Table 3 summarizes the formulas utilized to compute for the various indices.

Table 3. Summary of formulas used to describe the diversity of the forest

No	Index	Formula	Legend
1	Shannon-Weiner Index of Diversity (H')	$H' = -(\Sigma^S_{i=1} (p_i ln p_i)$	p_i : fraction of the entire population made up of species *i* S: species richness $\Sigma^S_{i=1}$: sum of species from 1 to S
2	Pielou's Index of Evenness (J)	$J = (H' / lnS)$	H': Shannon-Weiner Index of Diversity lnS: natural logarithm of species richness
3	Simpson's Index of Dominance (C)	$C = \Sigma^S_{i=1} (p_1^2)$	p_i : fraction of the entire population made up of species *i* S: species richness $\Sigma^S_{i=1}$: sum of species from 1 to S
4	Effective Number of Species (ENS)	$ENS = exp (H')$	H': Shannon-Weiner Index of Diversity

Shannon-Weiner's Index of Diversity was compared to the categorization of Fernando (1998) as utilized by Lumbres *et al.* (2023) while Pielou's Index of Evenness was compared to the diversity scale by Gevana and Pampolina (2009) as cited by Catulay *et al*. (2024). Figure 1 shows Gevana and Pampolina's diversity scale as taken from Catulay *et al*. (2024), it also shows the categorization of Fernando (1998) using Shannon-Weiner's Index of Diversity.

Relative Interpretation	Shannon (H') Index	Evenness Index
Very High	>3.5	0.75-1.00
High	3.00-3.49	0.50-0.74
Moderate	2.50-2.99	0.25-0.49
Low	2.00-2.49	0.15-0.24
Very Low	<1.99	0.05-0.14

***Figure 1**. diversity scale by Gevana and Pampolina (2009) as cited by Catulay et al. (2024)*

Biomass was assessed using allometric models since cutting of trees is prohibited inside Subic Bay and that laboratory carbon stock assessment procedures are not feasible to the team. In order to determine the aboveground biomass (AGB), the allometric equations developed by Brown (1997) as cited by Lumbres *et al* (2023) while belowground biomass (BGB) was estimated using the allometric equation developed by Cairnes *et al* (1997) as cited by Lumbres *et al* (2023). Utilization of such formulae are used by other literature as well such as in the studies of Ojeda, Jang, Park, and Kang (2024), Andulan, Cuyugan, and De Castro (2017), Zaragoza *et al* (2016), Guiabao (2016), and Labata *et al* (2012).

Carbon stock was assessed by multiplying the total biomass to 47% as suggested by the Intergovernmental Panel on Climate Change (2006) as biomass is 47% carbon. Likewise, CO_2 sequestered was taken by multiplying the estimated carbon content to the molecular weight ratio of CO_2 to C as suggested by Pendleton *et al* (2012) as cited by Lumbres *et al* (2023).

Results and Discussions

The following are the results and discussion of the data collection from the Subic Bay forest diversity monitoring of 2025.

Community Structure

A. Species Richness and Composition

A total of 373 individuals from 67 species were observed and recorded. From the 67 species, only 48 species were successfully identified representing 26 families. From the 26 families, the most represented is Dipterocarpaceae with 8 species (16.67%) coming from this family. Figure 2 shows the family composition of the species identified during the monitoring.

According to Pito *et al* (2019), Dipterocarp tree species are dominant in Southeast Asia as well as the Philippines. Additionally, the Field Museum (2025) wrote that many of the large, hardwood trees in the country are members of the Dipterocarp family. It is therefore consistent that inside Subic Bay it would be a well represented family.

In the resource inventory conducted in 1999 of the Subic Bay forest, the most represented tree family was Moraceae (17 species). This difference, however, may be attributed to the difference in survey procedure since in the resource inventory, even though there are more sites visited, only a quick inventory was conducted and that all flora species found along trails were considered. However, it can still be noted that in the resource inventory, the Dipterocarp family was part of the top 5 well represented families in the Subic Bay forest.

The Dipterocaps are key species due to their ecological and economical values (Calago and Diola, 2022). In the country, approximately 80% of timber resources are from Dipterocarp species where these species are used as lumber, material in paper making, oily resin, and furniture production (Bragais *et al*, 2022). In Subic Bay, although the Aetas do utilize smaller trees for their houses, it is uncommon due to the strict implementation of policies. During the 2025 forest diversity monitoring, evidence of illegal tree utilization was not observed in the monitoring sites.

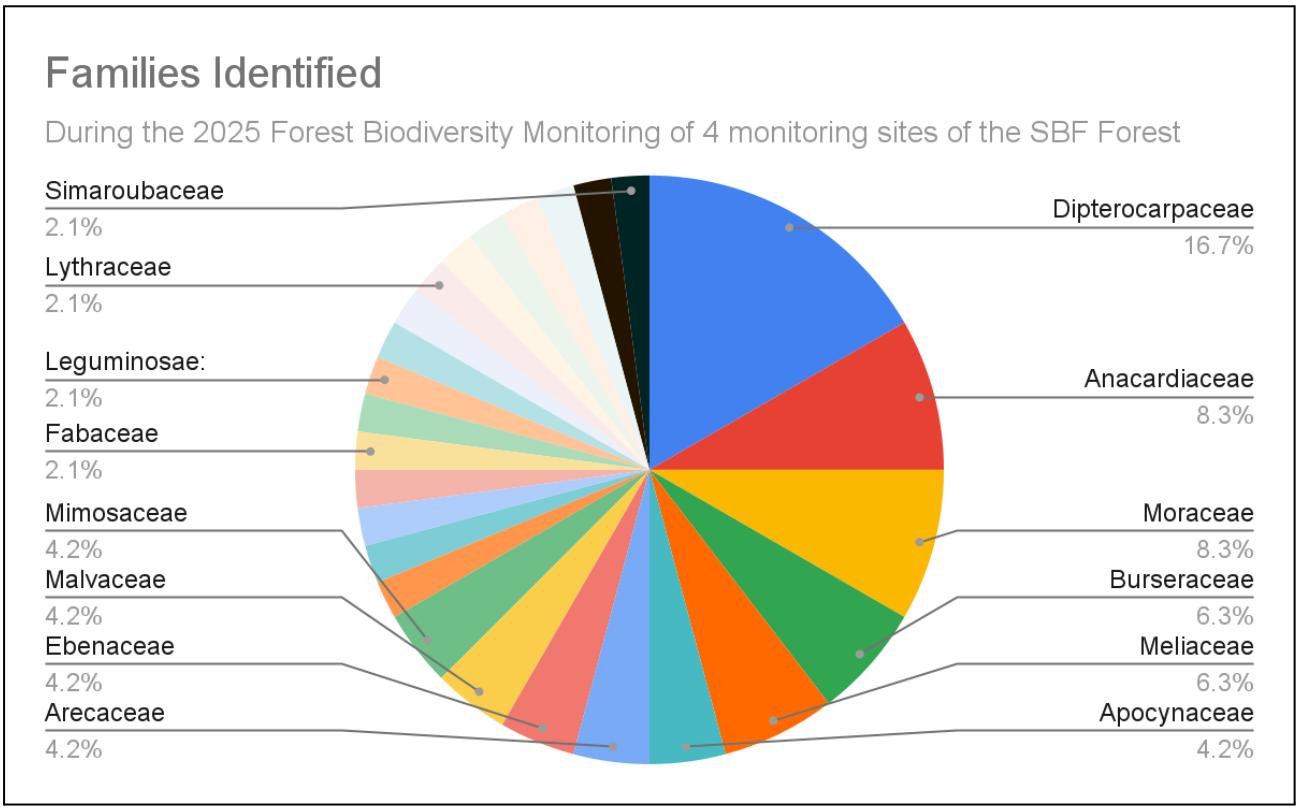

***Figure 2**. Families identified during the 2025 forest diversity monitoring of 4 monitoring sites of the SBF forest*

From the 67 species, the most abundant was the White Lauan with 47 individuals in total on all monitoring sites. Appendix I shows the complete list of species identified with their corresponding taxonomy as well as their conservation status.

Out of the 48 identified species, twenty-six (26) species were also found in the resource inventory list in 1999. It is important to note, however, that the resource inventory was not only focused on trees but also on all floral species within their transect. Additionally, the procedure used in the resource inventory is different from the circular plot methodology used in the monitoring.

B. Relative Frequency, Relative Density, Relative Dominance, and Species Importance Value

In terms of relative frequency, Amugis, Bakan, Bolong Eta, Duguan, Guiho, White Lauan, Palosapis, and Santol had the highest relative frequency with 3.174%. This means that these species have the highest distribution in all of the monitoring sites. For relative density, White Lauan had the highest relative density at 12.601%. This means that it is the most abundant among the species in the monitoring sites. For relative dominance, White Lauan had the highest relative dominance with 35.853%. This means that in terms of basal area, White Lauan had the highest coverage among the species recorded.

In terms of species importance value, White Lauan was found to have the highest importance value at 17.209%. This means that White Lauan is the most dominant species constituting the majority of the biomass in the monitoring sites. Appendix II shows the complete computation for Relative Density, Relative Frequency, Relative Dominance, and Species Importance Value.

White Lauan, or *Shorea contorta* S. Vidal, is a Philippine endemic tree species that is listed as “Vulnerable” in DAO 2017-11 and as “Least Concerned” with a decreasing global population trend under the IUCN Red List of Threatened Species. It was once classified as “Critically Endangered" by the IUCN Red List in 1998 due to intensive commercial logging in the country (Energy Development Corporation, 2020).

In the study of Palma (2024), it was stated that “as stand ages increase, there is a corresponding increase in tree biomass” noting that in their study area in Claveria, Misamis Oriental, White Lauan tree stands were among the oldest trees with an average DBH of 30.9cm. In the 2025 Subic Bay forest monitoring, White Lauan’s DBH had an average of 52.229cm where 124.141cm was the highest recorded DBH in this species from the 4 monitoring sites. This may indicate that White Lauan stands in the monitoring sites are among the oldest tree species inside the Subic Bay forest. Additionally, in the study of Bande *et al* (2014), they found that White Lauan seedlings are capable of storing large amounts of carbon compared to Tanguile, Yakal Saplungan, and Guisok-Guisok.

C. Conservation Status

From the 48 species successfully identified, using IUCN Red List of Threatened Species, seven (7) were categorized as “Vulnerable”, three (3) were “Endangered” while two (2) were “Near Threatened”. With DAO 2017-11, twelve (12) were listed as “Vulnerable”, two (2) were “Endangered” and two (2) were “Other Threatened Species”. A complete list of the species with their conservation status can be found in Appendix I.

According to the IUCN, species that are considered “Vulnerable” and “Endangered” face high risk of extinction in the wild. This means that it is important to conserve and preserve the Subic Bay forest as it is home to such types of floral species. It is therefore necessary to provide focus on identifying existing threats to these species to identify mitigating measures to help in their conservation.

Diversity Analysis

In terms of diversity analysis, the computed Shannon-Weiner’s Diversity Index was 3.581. According to the categorization of Fernando (1998) as cited by Lumbres *et al* (2023), this index falls under the “Very High” category. This is supported by the computed Pielou’s Index of Evenness that is 0.852 and is under the “Very High” category of Gevana and Pampolina (2009) as cited by Catulay *et al* (2024) which means that species are evenly distributed in the monitoring sites. Furthermore, in terms of dominance, the Simpson’s Index of Dominance was at 0.044 which means that there is no single species dominating in the monitoring sites, supporting the evenness computed and that in terms of effective number of species, the monitoring sites has an ENS of 2.6 equally common species. Table 4 shows the summary of the computed indices while Appendix III shows the complete diversity index computation.

Table 4. diversity indices computed for the 4 monitoring sites of the Subic Bay Forest for 2025

Index Type	Symbol	Value	Remarks
Shannon-Weiner Diversity Index	**H**	3.581	Very High
Pielou's Index of Evenness	**J**	0.852	Very High
Simpson's Index of Dominance	**C**	0.044	supports the value computed for J where no species dominate in the monitoring sites
Effective Number of Species	**ENS**	2.601	area has an equivalent diversity with a community having 2.6 equally common species

The Shannon-Weiner diversity index computed in the 1999 resource inventory of Subic Bay forest was 1.958 which is “Very Low” according to the categorization of Fernando (1998) as cited by Lumbres *et al* (2023). This does not mean that the forest diversity became “better” after twenty-six (26) years as, again, the procedures are not similar and that the species included are also not similar.

Biomass Assessment

Due to limited resources, laboratory incapacities, as well as limitations set by policies inside Subic Bay, biomass and carbon stock were assessed using non-destructive methods, i.e., estimations using allometric equations following the study of Lumbres *et al* (2023).

The total aboveground biomass (AGB) calculated was 457,965.67kg while total belowground biomass (BGB) calculated was 60,466.584kg. The total biomass calculated was 518,432.262kg and a total biomass per square meter of 51.569kg m^{-2}.

In terms of species, White Lauan had the most biomass on all 4 sites totalling to 201,888.777kg. This is consistent with the community structure where White Lauan was found to be the species with the highest importance value, indicating that it also has the highest biomass.

Carbon Stock Potential

From the total computed biomass, the total carbon calculated was 243,663.163kg which approximates to 24.237kgC m^{-2} with a rate of 5.993kgC m^{-2} yr^{-1}. The total CO_2 sequestered was at 894,243.81 kg which approximates to a total CO_2 sequestered per square meter of 88.952kgCO_2 m^{-2} and a sequestration rate of 21.996kgCO_2 m^{-2} yr^{-1}. Appendix IV shows the summary of biomass and carbon stock of each species.

Conclusion

Forest diversity assessment was conducted on 4 monitoring sites of the Subic Bay Forest with a total area of 10,053.096m^2 (1.005ha). A total of 373 individual trees were assessed belonging to 67 species where 48 species were successfully identified representing 26 families. The most well-represented family was the Dipterocarpaceae with 8 species belonging to this family. White Lauan (*Shorea contorta* S. Vidal) was found to be the species with the highest importance value, indicating that the majority of the biomass in the 4 sites is from this tree species. This was

supported by the estimated total biomass of White Lauan using the allometric method where it had the highest total biomass among the 67 tree species recorded. From the 4 monitoring sites, Subic Bay Forest falls under the “Very High” diversity category in accordance with the categorization of Fernando (1998). The total biomass of the 4 sites was 51.569kg m^{-2} and a total carbon of 24.237kgC m^{-2}, a total CO_2 sequestration of 88.952kgCO_2 m^{-2}, a total C sequestration rate of 5.993kg m^{-2} yr^{-1} and a total CO_2 sequestration rate of 21.996kg m^{-2} yr^{-1}.

Recommendation/s

The following are the recommendations based on this report:

1. Forest diversity monitoring should be continued, however, instead of conducting it yearly, it may be more efficient to conduct it every 3 years using the same monitoring methodology from this report to have a better comparison of the data collected. Additionally, a yearly transect walk around and along the trails of each monitoring site would be most effective, especially when checking for social issues or impacts.
2. A land survey of the current Subic Bay Forest is pertinent as the diversity may be categorized as very high but it does not mean that the scope or overall area of the forest is still good, especially that there had been several developments that happened between 1999 and 2025.
3. Although faunal species were included in the observations of each of the monitoring reports, providing a scientific analysis of the occurrence of these faunal species is not feasible since a separate monitoring should be conducted specific to fauna.
4. The results of this report may be utilized in creating an updated Subic Bay Forest management plan or program.

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Appendix I

Appendix I

List of species recorded and identified during the 2025 forest diversity monitoring of 4 monitoring sites of Subic Bay Freeport with their corresponding conservation status

No	Local Name	Scientific Name	Family	Identification Reference/s	Conservation Status	
					IUCN Red List (2024)	DAO 2017-11
1	**amugis**	*Koorsidendron pinnatum* (Blanco) Merr.	Anacardiaceae	Fernando *et al* (2004)	Vulnerable	Other Threatened Species
2	**dao**	*Dracontomelon dao* (Blanco) Merr. & Rolfe	Anacardiaceae	Fernando et al (2004)	Least Concern	Vulnerable
3	**lamio**	*Dracontomelon edule*	Anacardiaceae	https://rainforestation.ph/wp-content/uploads/2022/04/Guide_to_Rainforestation_Timber_Species.pdf	Not Listed	Not Listed
4	**pahotan**	*Mangifera altissima Blanco*	Anacardiaceae	*https://www.stuartxchange.org/Paho*	Data Deficient	Vulnerable
5	**ilang ilang**	*Cananga odorata* (Lamk.) Hook. f. & Thomson	Annonaceae	Fernando et al (2004)	Least Concern	Not Listed
6	**bayag usa**	*Voacanga globosa* (Blanco) Merr.	Apocynaceae	Fernando *et al* (2004)	Least Concern	Not Listed
7	**dirita**	*Alstonia scholaris* (L.) R. Br.	Apocynaceae	Fernando *et al* (2004)	Least Concern	Not Listed
8	**ditaan**	*Daemonorops mollis* (Blanco) Merr.	Arecaceae	Fernando *et al* (2004)	Not Listed	Not Listed
9	**takipan**	*Caryota rumphiana* Mart. var. *philippinensis* Becc.	Arecaceae	Fernando *et al* (2004)	Least Concern	Not Listed
10	**dulit**	*Canarium hirsutum* Willd.	Burseraceae	Fernando et al (2004)	Least Concern	Not Listed
11	**kila**	*Canarium hirsutum* Willd.	Burseraceae	Fernando et al (2004)	Least Concern	Not Listed
12	**palasahingin**	*Canarium asperum* Benth.	Burseraceae	Fernando et al (2004)	Least Concern	Not Listed
13	**liyusin**	*Maranthes corymbosa* Blume	Chrysobalanceae	Fernando *et al* (2004)	Least Concern	Not Listed
14	**calumpit**	*Terminalia microcarpa* Decne.	Combretaceae	Fernando *et al* (2004)	Least Concern	Not Listed
15	**narig**	*Vatica mangachapoi* Blanco	Dipterocarpaceae	https://www.stuartxchange.org/SalongSalong	Vulnerable	Vulnerable
16	**apitong**	*Dipterocarpus grandiflorus* (Blanco) Blanco	Dipterocarpaceae	Fernando et al (2004)	Endangered	Vulnerable
17	**bagtikan**	*Parashorea malaanonan* (Blanco) Merr.	Dipterocarpaceae	Fernando et al (2004)	Least Concern	Not Listed
18	**guiho**	*Shorea guiso* (Blanco) Blume	Dipterocarpaceae	Fernando et al (2004)	Vulnerable	Not Listed
19	**lauan**	*Shorea contorta* Vidal	Dipterocarpaceae	Fernando *et al* (2004)	Least Concern	Vulnerable
20	**panao**	*Dipterocarpus gracilis* Blume	Dipterocarpaceae	Fernando *et al* (2018)	Vulnerable	Vulnerable
21	**tangile**	*Shorea polysperma* (Blanco) Merr.	Dipterocarpaceae	https://pfaf.org/user/Plant.aspx?LatinName=Shorea+polysperma	Least Concern	Vulnerable
22	**palosapis**	*Anisoptera thurifera* (Blanco) Blume	Dipterocarpaceae	https://www.stuartxchange.org/Palosapis	Vulnerable	Not Listed
23	**kamagong**	*Diospyros blancoi* A. DC.	Ebenaceae	Fernando et al (2004)	Not Listed	Not Listed
24	**bolong eta**	*Diospyros pilosanthera* var. *pilosanthera*	Ebenaceae	https://www.stuartxchange.org/Bolongeta.html	Least Concern	Vulnerable
25	**takip asin**	*Macaranga grandifolia* (Blanco) Merr.	Euphorbiaceae	Fernando *et al* (2004)	Near Threatened	Not Listed
26	**dila dila**	*Cynometra inaequifolia* A. Gray	Fabaceae	Fernando *et al* (2018)	Vulnerable	Vulnerable

27	**molave**	*Vitex parviflora* A.L. Juss	Lamiaceae	Fernando *et al* (2004)	Least Concern	Endangered
28	**narra**	*Pterocarpus indicus* Willd.	Leguminosae: Papilionoideae	Fernando et al (2004)	Endangered	Vulnerable
29	**tindalo**	*Afzelia rhomboidea* (Blanco) Vidal	Leguminosea: Caesalpinioidea	Fernando *et al* (2004)	Vulnerable	Endangered
30	**kupang**	*Parkia timoriana* (DC.) Merr.	Leguminosea: Mimosoidea	Fernando *et al* (2004)	Least Concern	Not Listed
31	**banaba**	*Lagerstroemia speciosa* (L.) Pers.	Lythraceae	Fernando et al (2004)	Least Concern	Not Listed
32	**dungon**	*Heritiera sylvatica* Vidal	Malvaceae	Fernando et al (2004)	Not Listed	Not Listed
33	**taluto**	*Pterocymbium tinctorium* (Blanco) Merr.	Malvaceae	Fernando et al (2004)	Least Concern	Not Listed
34	**kalantas**	*Toona calantas* Merr. & Rolfe	Meliaceae	Fernando et al (2004)	Data Deficient	Vulnerable
35	**mahogany**	*Swietenia macrophylla* King	Meliaceae	Fernando *et al* (2004)	Endangered	Not Listed
36	**santol**	*Sandoricum koetjape* (Burm.f.) Merr.	Meliaceae	Fernando *et al* (2004)	Least Concern	Not Listed
37	**akle**	*Albizia* sp	Mimosaceae	https://issuu.com/naniegonzales/docs/washingtonsycipgardenofnativetrees/74	N/A	Not Listed
38	**akleng gubat**	*Albizia acle*	Mimosaceae	https://issuu.com/naniegonzales/docs/washingtonsycipgardenofnativetrees/74	Near Threatened	Not Listed
39	**antipolo**	*Artocarpus blancoi* (Elm.) Merr.	Moraceae	Fernando *et al* (2004)	Least Concern	Not Listed
40	**anubing**	*Artocarpus ovatus* Blanco	Moraceae	Fernando *et al* (2004)	Not Listed	Not Listed
41	**tangisang bayawak**	*Ficus variegata* Blume	Moraceae	Fernando *et al* (2004)	Least Concern	Not Listed
42	**tibig**	*Ficus nota* (Blanco) Merr.	Moraceae	Fernando *et al* (2004)	Least Concern	Not Listed
43	**duguan**	*Myristica philippensis* Lam.	Myristricaceae	Fernando et al (2004)	Least Concern	Other Threatened Species
44	**kamayuan**	*Strombosia philippinensis* (Baill.) Rolfe	Olacaceae	Fernando *et al* (2004)	Least Concern	Not Listed
45	**aniatan**	*Cleistanthrus sumatranus* (Miq.) Mull. Arg.	Phyllanthaceae	Fernando *et al* (2018)	Not Listed	Not Listed
46	**apatot**	*Morinda citrifolia*	Rubiaceae	*https://www.stuartxchange.org/Apatot.html#:~:text=Apatot%20%2F%20Morinda%20citrifolia%20%2F%20Noni%20%2F,Alternative%20Medicine%20%2F%20Medicinal%20Herbs%20%2F%20StuartXchange*	Least Concern	Not Listed
47	**alupag**	*Litchi chinensis* Sonn. subsp. *philippinensis* (Radlk.) Leenh.	Sapindaceae	Fernando *et al* (2018)	Not Listed	Vulnerable
48	**malasapsap**	*Ailanthus intergrifolia* Lamk	Simaroubaceae	Fernando *et al* (2004)	Not Listed	Not Listed
49	**aniatang puti**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
50	**bahay bukbuk**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
51	**bakan**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
52	**bayag kabayo**	*Not Found*	*Not found*	*Not Found*	*Not Found*	*Not Found*
53	**bayog**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
54	**bitnung**	*Not Found*	*Not found*	*Not Found*	*Not Found*	*Not Found*
55	**dikil**	*Not Found*	*Not found*	*Not Found*	*Not Found*	*Not Found*
56	**dila dilang puti**	*Not Found*	*Not found*	*Not Found*	*Not Found*	*Not Found*
57	**kalumata**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
58	**kalyos**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
59	**kataybang**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
60	**lagulo**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
61	**ligaa**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*

62	**mala-apple**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
63	**mala-mangga**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
64	**malakulis**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
65	**mayango**	*Not Found*	*Not found*	*Not Found*	*Not Found*	*Not Found*
66	**susong aso**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*
67	**tapat tapat**	*Not found*	*Not found*	*Not found*	*Not found*	*Not found*

Appendix II

Appendix II

Relative density, relative frequency, relative dominance, and species importance value of species recorded and identified during the 2025 forest diversity monitoring of 4 monitoring sites of Subic Bay Freeport

No	Local Name	Count					Basal Area	Frequency	Density	Relative Dominance	Relative Frequency	Relative Density	Species Importance Value	Rank (based on SIV)
		Hill 394	Apaliin	Pamula klakin	El Kabayo	Total								
1	akle	47	0	0	0	**47**	0.716	1.000	0.0001	1.913	0.794	0.268	0.992	**30**
2	akleng gubat	0	0	0	30	**30**	0.421	1.000	0.0001	1.124	0.794	0.268	0.729	**40**
3	alupag	0	23	0	0	**23**	0.576	3.000	0.0011	1.538	2.381	2.949	2.289	**12**
4	amugis	0	23	0	0	**23**	1.850	4.000	0.0013	4.942	3.175	3.485	3.867	**3**
5	aniatan	17	0	0	0	**17**	0.317	3.000	0.0023	0.847	2.381	6.166	3.131	**6**
6	aniatang puti	0	0	14	0	**14**	0.476	2.000	0.0007	1.271	1.587	1.877	1.578	**20**
7	antipolo	0	13	0	0	**13**	0.351	1.000	0.0001	0.937	0.794	0.268	0.666	**42**
8	anubing	0	11	0	2	**13**	0.087	1.000	0.0002	0.233	0.794	0.536	0.521	**47**
9	apatot	0	0	0	12	**12**	0.016	1.000	0.0001	0.043	0.794	0.268	0.368	**61**
10	apitong	0	11	0	0	**11**	0.536	3.000	0.0007	1.433	2.381	1.877	1.897	**16**
11	bagtikan	0	0	11	0	**11**	0.012	1.000	0.0001	0.032	0.794	0.268	0.365	**64**
12	bahay bukbuk	0	0	0	9	**9**	0.057	1.000	0.0001	0.154	0.794	0.268	0.405	**52**
13	bakan	9	0	0	0	**9**	0.536	4.000	0.0023	1.433	3.175	6.166	3.591	**4**
14	banaba	0	0	0	8	**8**	0.378	1.000	0.0002	1.010	0.794	0.536	0.780	**36**
15	bayag kabayo	0	0	8	0	**8**	0.013	1.000	0.0001	0.034	0.794	0.268	0.365	**63**
16	bayag usa	0	7	0	0	**7**	0.020	1.000	0.0002	0.054	0.794	0.536	0.461	**49**
17	bayog	0	7	0	0	**7**	0.024	1.000	0.0001	0.064	0.794	0.268	0.375	**58**
18	bitnung	0	0	0	6	**6**	0.120	1.000	0.0003	0.320	0.794	0.804	0.639	**44**
19	bolong eta	5	0	0	0	**5**	0.758	4.000	0.0013	2.026	3.175	3.485	2.895	**8**
20	calumpit	3	0	2	0	**5**	1.617	1.000	0.0009	4.320	0.794	2.413	2.509	**11**
21	dao	0	0	5	0	**5**	0.624	1.000	0.0001	1.666	0.794	0.268	0.909	**32**
22	dikil	0	0	5	0	**5**	0.009	1.000	0.0001	0.023	0.794	0.268	0.362	**67**
23	dila dila	0	0	5	0	**5**	0.149	2.000	0.0003	0.398	1.587	0.804	0.930	**31**
24	dila dilang puti	1	0	0	3	**4**	0.011	1.000	0.0002	0.030	0.794	0.536	0.453	**50**
25	dirita	4	0	0	0	**4**	0.044	1.000	0.0001	0.116	0.794	0.268	0.393	**55**
26	ditaan	0	0	4	0	**4**	0.091	2.000	0.0006	0.244	1.587	1.609	1.147	**27**
27	duguan	0	0	4	0	**4**	0.180	4.000	0.0008	0.482	3.175	2.145	1.934	**14**
28	dulit	0	0	4	0	**4**	0.010	1.000	0.0001	0.026	0.794	0.268	0.363	**65**
29	dungon	0	0	4	0	**4**	0.385	1.000	0.0001	1.029	0.794	0.268	0.697	**41**
30	guiho	0	3	0	0	**3**	0.982	4.000	0.0012	2.624	3.175	3.217	3.005	**7**
31	ilang ilang	0	0	0	3	**3**	0.409	2.000	0.0003	1.092	1.587	0.804	1.161	**26**
32	kalantas	0	0	0	3	**3**	0.136	2.000	0.0002	0.364	1.587	0.536	0.829	**34**
33	kalumata	0	0	3	0	**3**	0.056	1.000	0.0001	0.150	0.794	0.268	0.404	**53**
34	kalyos	0	2	0	0	**2**	0.081	1.000	0.0001	0.217	0.794	0.268	0.426	**51**
35	kamagong	0	2	0	0	**2**	0.235	1.000	0.0001	0.629	0.794	0.268	0.564	**46**
36	kamayuan	0	2	0	0	**2**	1.677	3.000	0.0030	4.481	2.381	8.043	4.968	**2**

37	**kataybang**	0	0	0	2	**2**	0.146	2.000	0.0002	0.389	1.587	0.536	0.838	**33**
38	**kila**	0	0	0	2	**2**	0.051	1.000	0.0001	0.136	0.794	0.268	0.399	**54**
39	**kupang**	0	0	0	2	**2**	1.103	3.000	0.0004	2.945	2.381	1.072	2.133	**13**
40	**lagulo**	2	0	0	0	**2**	0.198	3.000	0.0004	0.530	2.381	1.072	1.328	**25**
41	**lamio**	0	0	2	0	**2**	0.177	1.000	0.0002	0.471	0.794	0.536	0.600	**45**
42	**lauan**	0	0	2	0	**2**	13.422	4.000	0.0047	35.853	3.175	12.601	17.209	**1**
43	**ligaa**	0	0	2	0	**2**	0.023	1.000	0.0001	0.062	0.794	0.268	0.375	**59**
44	**liyusin**	0	1	0	0	**1**	0.172	3.000	0.0005	0.459	2.381	1.340	1.393	**23**
45	**mahogany**	0	1	0	0	**1**	0.267	3.000	0.0017	0.714	2.381	4.558	2.551	**10**
46	**mala-apple**	0	1	0	0	**1**	0.252	3.000	0.0009	0.674	2.381	2.413	1.822	**18**
47	**mala-mangga**	0	1	0	0	**1**	0.010	1.000	0.0001	0.026	0.794	0.268	0.363	**65**
48	**malakulis**	0	1	0	0	**1**	0.064	1.000	0.0005	0.172	0.794	1.340	0.769	**37**
49	**malasapsap**	0	1	0	0	**1**	0.263	3.000	0.0005	0.702	2.381	1.340	1.474	**22**
50	**mayango**	0	1	0	0	**1**	0.017	1.000	0.0001	0.045	0.794	0.268	0.369	**60**
51	**molave**	0	1	0	0	**1**	0.040	1.000	0.0001	0.107	0.794	0.268	0.390	**56**
52	**narig**	0	0	0	1	**1**	1.061	1.000	0.0004	2.833	0.794	1.072	1.566	**21**
53	**narra**	0	0	0	1	**1**	0.126	1.000	0.0003	0.338	0.794	0.804	0.645	**43**
54	**pahotan**	0	0	0	1	**1**	0.221	2.000	0.0004	0.590	1.587	1.072	1.083	**29**
55	**palasahingin**	0	0	0	1	**1**	0.048	2.000	0.0002	0.129	1.587	0.536	0.751	**38**
56	**palosapis**	0	0	0	1	**1**	0.392	4.000	0.0014	1.047	3.175	3.753	2.658	**9**
57	**panao**	0	0	0	1	**1**	0.778	3.000	0.0005	2.078	2.381	1.340	1.933	**15**
58	**santol**	0	0	0	1	**1**	0.129	4.000	0.0008	0.345	3.175	2.145	1.888	**17**
59	**susong aso**	0	0	0	1	**1**	0.231	2.000	0.0011	0.618	1.587	2.949	1.718	**19**
60	**takip asin**	0	0	0	1	**1**	0.083	2.000	0.0002	0.222	1.587	0.536	0.782	**35**
61	**takipan**	1	0	0	0	**1**	0.016	1.000	0.0001	0.043	0.794	0.268	0.368	**61**
62	**taluto**	1	0	0	0	**1**	0.288	2.000	0.0004	0.768	1.587	1.072	1.143	**28**
63	**tangile**	0	0	1	0	**1**	2.977	2.000	0.0004	7.952	1.587	1.072	3.537	**5**
64	**tangisang bayawak**	0	0	1	0	**1**	0.718	1.000	0.0005	1.917	0.794	1.340	1.351	**24**
65	**tapat tapat**	0	0	1	0	**1**	0.026	2.000	0.0002	0.071	1.587	0.536	0.731	**39**
66	**tibig**	0	0	1	0	**1**	0.037	1.000	0.0001	0.098	0.794	0.268	0.387	**57**
67	**tindalo**	0	0	1	0	**1**	0.137	1.000	0.0001	0.365	0.794	0.268	0.476	**48**
Total		90	112	80	91	**373**	37.437	126.000	0.0371					

Appendix III

Appendix III

diversity index computation of the species recorded and identified during the 2025 forest diversity monitoring of 4 monitoring sites of Subic Bay Freeport

No	Local Name	Count					Pi	Pi^2	lnPi	Pi(lnPi)
		Hill 394	Apaliin	Pamulaklakin	El Kabayo	Total				
1	akle	13	16	7	11	**47**	0.12601	0.01588	-2.07143	-0.26101
2	akleng gubat	9	19	2	0	**30**	0.08043	0.00647	-2.52038	-0.20271
3	alupag	7	0	9	7	**23**	0.06166	0.00380	-2.78608	-0.17180
4	amugis	5	10	2	6	**23**	0.06166	0.00380	-2.78608	-0.17180
5	aniatan	1	0	1	15	**17**	0.04558	0.00208	-3.08837	-0.14076
6	aniatang puti	5	3	5	1	**14**	0.03753	0.00141	-3.28252	-0.12320
7	antipolo	1	4	2	6	**13**	0.03485	0.00121	-3.35663	-0.11699
8	anubing	3	5	4	1	**13**	0.03485	0.00121	-3.35663	-0.11699
9	apatot	1	2	4	5	**12**	0.03217	0.00104	-3.43667	-0.11056
10	apitong	4	3	4	0	**11**	0.02949	0.00087	-3.52368	-0.10392
11	bagtikan	4	7	0	0	**11**	0.02949	0.00087	-3.52368	-0.10392
12	bahay bukbuk	1	3	3	2	**9**	0.02413	0.00058	-3.72435	-0.08986
13	bakan	1	6	2	0	**9**	0.02413	0.00058	-3.72435	-0.08986
14	banaba	1	5	1	1	**8**	0.02145	0.00046	-3.84214	-0.08241
15	bayag kabayo	1	4	2	1	**8**	0.02145	0.00046	-3.84214	-0.08241
16	bayag usa	5	0	2	0	**7**	0.01877	0.00035	-3.97567	-0.07461
17	bayog	1	0	3	3	**7**	0.01877	0.00035	-3.97567	-0.07461
18	bitnung	1	5	0	0	**6**	0.01609	0.00026	-4.12982	-0.06643
19	bolong eta	1	3	0	1	**5**	0.01340	0.00018	-4.31214	-0.05780
20	calumpit	0	0	0	5	**5**	0.01340	0.00018	-4.31214	-0.05780
21	dao	2	1	2	0	**5**	0.01340	0.00018	-4.31214	-0.05780
22	dikil	1	0	2	2	**5**	0.01340	0.00018	-4.31214	-0.05780
23	dila dila	0	0	0	5	**5**	0.01340	0.00018	-4.31214	-0.05780
24	dila dilang puti	1	0	1	2	**4**	0.01072	0.00012	-4.53528	-0.04864
25	dirita	0	2	1	1	**4**	0.01072	0.00012	-4.53528	-0.04864
26	ditaan	0	0	4	0	**4**	0.01072	0.00012	-4.53528	-0.04864
27	duguan	0	0	3	1	**4**	0.01072	0.00012	-4.53528	-0.04864
28	dulit	0	2	0	2	**4**	0.01072	0.00012	-4.53528	-0.04864
29	dungon	3	1	0	0	**4**	0.01072	0.00012	-4.53528	-0.04864
30	guiho	3	0	0	0	**3**	0.00804	0.00006	-4.82297	-0.03879
31	ilang ilang	0	0	1	2	**3**	0.00804	0.00006	-4.82297	-0.03879
32	kalantas	2	0	1	0	**3**	0.00804	0.00006	-4.82297	-0.03879
33	kalumata	0	3	0	0	**3**	0.00804	0.00006	-4.82297	-0.03879
34	kalyos	1	0	0	1	**2**	0.00536	0.00003	-5.22843	-0.02803
35	kamagong	0	2	0	0	**2**	0.00536	0.00003	-5.22843	-0.02803
36	kamayuan	2	0	0	0	**2**	0.00536	0.00003	-5.22843	-0.02803
37	kataybang	2	0	0	0	**2**	0.00536	0.00003	-5.22843	-0.02803

38	**kila**	1	0	1	0	**2**	0.00536	0.00003	-5.22843	-0.02803
39	**kupang**	0	1	0	1	**2**	0.00536	0.00003	-5.22843	-0.02803
40	**lagulo**	2	0	0	0	**2**	0.00536	0.00003	-5.22843	-0.02803
41	**lamio**	0	1	1	0	**2**	0.00536	0.00003	-5.22843	-0.02803
42	**lauan**	0	1	0	1	**2**	0.00536	0.00003	-5.22843	-0.02803
43	**ligaa**	0	0	1	1	**2**	0.00536	0.00003	-5.22843	-0.02803
44	**liyusin**	0	0	0	1	**1**	0.00268	0.00001	-5.92158	-0.01588
45	**mahogany**	0	0	1	0	**1**	0.00268	0.00001	-5.92158	-0.01588
46	**mala-apple**	0	0	1	0	**1**	0.00268	0.00001	-5.92158	-0.01588
47	**mala-mangga**	0	0	0	1	**1**	0.00268	0.00001	-5.92158	-0.01588
48	**malakulis**	0	1	0	0	**1**	0.00268	0.00001	-5.92158	-0.01588
49	**malasapsap**	0	0	0	1	**1**	0.00268	0.00001	-5.92158	-0.01588
50	**mayango**	1	0	0	0	**1**	0.00268	0.00001	-5.92158	-0.01588
51	**molave**	0	0	1	0	**1**	0.00268	0.00001	-5.92158	-0.01588
52	**narig**	0	1	0	0	**1**	0.00268	0.00001	-5.92158	-0.01588
53	**narra**	1	0	0	0	**1**	0.00268	0.00001	-5.92158	-0.01588
54	**pahotan**	0	0	1	0	**1**	0.00268	0.00001	-5.92158	-0.01588
55	**palasahingin**	0	0	1	0	**1**	0.00268	0.00001	-5.92158	-0.01588
56	**palosapis**	0	0	0	1	**1**	0.00268	0.00001	-5.92158	-0.01588
57	**panao**	0	0	1	0	**1**	0.00268	0.00001	-5.92158	-0.01588
58	**santol**	0	0	0	1	**1**	0.00268	0.00001	-5.92158	-0.01588
59	**susong aso**	0	1	0	0	**1**	0.00268	0.00001	-5.92158	-0.01588
60	**takip asin**	0	0	0	1	**1**	0.00268	0.00001	-5.92158	-0.01588
61	**takipan**	0	0	1	0	**1**	0.00268	0.00001	-5.92158	-0.01588
62	**taluto**	0	0	1	0	**1**	0.00268	0.00001	-5.92158	-0.01588
63	**tangile**	1	0	0	0	**1**	0.00268	0.00001	-5.92158	-0.01588
64	**tangisang bayawak**	0	0	0	1	**1**	0.00268	0.00001	-5.92158	-0.01588
65	**tapat tapat**	1	0	0	0	**1**	0.00268	0.00001	-5.92158	-0.01588
66	**tibig**	1	0	0	0	**1**	0.00268	0.00001	-5.92158	-0.01588
67	**tindalo**	0	0	1	0	**1**	0.00268	0.00001	-5.92158	-0.01588
Total		90	112	80	91	**373**	1.00000	0.04400	-323.41277	-3.58119

diversity Index			
Index Type	**Symbol**	**Value**	**Remarks**
Shannon-Weiner Diversity Index	**H**	3.581	Very High
Pielou's Index of Evenness	**J**	0.852	Very High
Simpson's Index of Dominance	**C**	0.044	supports the value computed for J where no species dominate in the monitoring sites
Effective Number of Species	**ENS**	2.601	area has an equivalent diversity with a community having 2.6 equally common species

Appendix IV

Appendix IV

Biomass and carbon stock assessment of the species recorded and identified during the 2025 forest diversity monitoring of 4 monitoring sites of Subic Bay Freeport

No	Local Name	Total ABG per species in kg	Total BGB per species in kg	Total Biomass per species in kg	Total %C per species in kg	Total CO2 sequestered per species in kg
1	akle	10146.06194	1202.754281	11348.81623	5333.943626	**19575.57311**
2	akleng gubat	5762.569839	729.6135786	6492.183417	3051.326206	**11198.36718**
3	alupag	5615.707441	880.03087	6495.738311	3052.997006	**11204.49901**
4	amugis	23518.66794	3091.323631	26609.99157	12506.69604	**45899.57446**
5	aniatan	2022.529894	402.1986394	2424.728534	1139.622411	**4182.414248**
6	aniatang puti	5022.500583	751.3962455	5773.896829	2713.731509	**9959.39464**
7	antipolo	4736.657161	613.5634044	5350.220565	2514.603666	**9228.595453**
8	anubing	737.8316808	125.5818435	863.4135244	405.8043564	**1489.301988**
9	apatot	99.55293253	20.21589612	119.7688286	56.29134946	**206.5892525**
10	apitong	5676.918344	851.192793	6528.111137	3068.212234	**11260.3389**
11	bagtikan	69.31382308	14.68117632	83.9949994	39.47764972	**144.8829745**
12	bahay bukbuk	497.5723971	83.78275573	581.3551528	273.2369218	**1002.779503**
13	bakan	4112.259092	736.5219206	4848.781013	2278.927076	**8363.662369**
14	banaba	4605.698226	640.6609348	5246.359161	2465.788806	**9049.444917**
15	bayag kabayo	73.89893435	15.53606838	89.43500273	42.03445128	**154.2664362**
16	bayag usa	116.5522846	24.65824372	141.2105283	66.36894829	**243.5740402**
17	bayog	165.4032361	31.66051043	197.0637465	92.61996085	**339.9152563**
18	bitnung	970.3137276	169.3128369	1139.626565	535.6244853	**1965.741861**
19	bolong eta	7172.63593	1146.448705	8319.084635	3909.969778	**14349.58909**
20	calumpit	21268.67604	2616.363747	23885.03979	11225.9687	**41199.30513**
21	dao	8767.794718	1057.183474	9824.978193	4617.739751	**16947.10488**
22	dikil	45.42204316	10.10585954	55.5279027	26.09811427	**95.78007936**
23	dila dila	1417.038439	225.5110209	1642.549459	771.998246	**2833.233563**
24	dila dilang puti	52.47507751	12.4322008	64.90727831	30.50642081	**111.9585644**
25	dirita	350.4149678	61.46185452	411.8768224	193.5821065	**710.4463309**
26	ditaan	573.5281955	115.1424858	688.6706813	323.6752202	**1187.888058**
27	duguan	1266.596368	239.1892671	1505.785635	707.7192485	**2597.329642**
28	dulit	52.7130991	11.5265586	64.2396577	30.19263912	**110.8069856**
29	dungon	5237.029409	670.4956262	5907.525035	2776.536766	**10189.88993**
30	guiho	10984.92181	1570.566702	12555.48851	5901.079601	**21656.96213**
31	ilang ilang	5315.257808	697.5747282	6012.832536	2826.031292	**10371.53484**
32	kalantas	1429.079127	215.6750875	1644.754214	773.0344806	**2837.036544**
33	kalumata	482.8953144	81.59526087	564.4905753	265.3105704	**973.6897934**
34	kalyos	769.767327	123.1968668	892.9641937	419.6931711	**1540.273938**
35	kamagong	2960.147612	405.0092333	3365.156846	1581.623718	**5804.559043**
36	kamayuan	17443.61769	2625.816216	20069.43391	9432.633936	**34617.76654**
37	kataybang	1344.75687	218.3992808	1563.156151	734.6833909	**2696.288045**
38	kila	426.8193153	73.163772	499.9830873	234.992051	**862.4208273**

39	**kupang**	14804.89381	1869.662739	16674.55655	7837.041576	**28761.94259**
40	**lagulo**	1730.109224	289.3498601	2019.459084	949.1457694	**3483.364974**
41	**lamio**	1868.706545	280.4987829	2149.205328	1010.126504	**3707.164271**
42	**lauan**	179518.9193	22369.85789	201888.7772	94887.72527	**348237.9517**
43	**ligaa**	157.9001745	30.38808316	188.2882577	88.49548112	**324.7784157**
44	**liyusin**	1377.46735	241.4370085	1618.904359	760.8850486	**2792.448128**
45	**mahogany**	1684.144343	338.0181829	2022.162526	950.4163872	**3488.028141**
46	**mala-apple**	1907.473517	345.3888514	2252.862369	1058.845313	**3885.9623**
47	**mala-mangga**	52.7130991	11.5265586	64.2396577	30.19263912	**110.8069856**
48	**malakulis**	382.8240989	79.34689626	462.1709952	217.2203677	**797.1987495**
49	**malasapsap**	2468.303454	395.3673453	2863.670799	1345.925276	**4939.545761**
50	**mayango**	105.2455427	21.23399114	126.4795338	59.4453809	**218.1645479**
51	**molave**	315.5803983	56.03069967	371.611098	174.657216	**640.9919829**
52	**narig**	14098.78477	1791.103189	15889.88796	7468.24734	**27408.46774**
53	**narra**	1064.885798	181.6616321	1246.54743	585.8772922	**2150.169662**
54	**pahotan**	2129.304884	336.0199883	2465.324872	1158.70269	**4252.438872**
55	**palasahingin**	346.4172202	64.75452908	411.1717493	193.2507222	**709.2301503**
56	**palosapis**	3278.059403	558.1902292	3836.249632	1803.037327	**6617.146991**
57	**panao**	9949.049055	1330.784941	11279.834	5301.521978	**19456.58566**
58	**santol**	827.7806334	164.5144134	992.2950468	466.378672	**1711.609726**
59	**susong aso**	1658.102428	308.8613798	1966.963808	924.4729897	**3392.815872**
60	**takip asin**	669.2710656	117.2223788	786.4934444	369.6519188	**1356.622542**
61	**takipan**	99.55293253	20.21589612	119.7688286	56.29134946	**206.5892525**
62	**taluto**	3002.881441	453.4529459	3456.334387	1624.477162	**5961.831184**
63	**tangile**	43171.53158	4773.118333	47944.64992	22533.98546	**82699.72664**
64	**tangisang bayawak**	8058.736596	1173.323568	9232.060164	4339.068277	**15924.38058**
65	**tapat tapat**	156.1601392	32.49169849	188.6518377	88.6663637	**325.4055548**
66	**tibig**	282.9267083	50.87583281	333.8025411	156.8871943	**575.7760032**
67	**tindalo**	1486.355778	220.3434356	1706.699214	802.1486304	**2943.885473**
Total in kg		**457965.6779**	**60466.58485**	**518432.2628**	**243663.1635**	**894243.81**
Total in kg per sqm		**45.55468838**	**6.01472242**	**51.5694108**	**24.23762307**	**88.95207668**
Total in kg per sqm (from previous monitoring of the 4 sites)		**22.48274493**	**3.581490913**	**26.06423584**	**12.25019085**	**44.95820041**
Rate in kg per sqm per year		**11.53597172**	**1.216615753**	**12.75258748**	**5.993716114**	**21.99693814**

Appendix V

Appendix V

Photos of the 2025 Subic Bay Forest diversity Monitoring

***Plate 1**. (Left) MSG personnel, Ms. Joceylyn Pabayan, estimating the merchantable height of the tree, (center) Mr. Michael Blanco holding the transect meter, and (right) Mr. Roland Abraham measuring the girth of the tree to calculate its DBH during the March 21, 2025 monitoring of Apaliin Forest*

***Plate 2**. (Left) MSG personnel, Ms. Carla Pabayan completing the monitoring data sheet and (left) Mr. Reymart Cudrado measuring the girth of the tree to calculate its DBH during the April 25, 2025 monitoring of El Kabayo Forest*

***Plate 3**. (Left) MSG personnel, Ms. Jocelyn Pabayan and Mr. Roland Abraham locating the established monitoring plot and (left) Mr. Luis Florentino measuring the girth of the tree to calculate its DBH noting that the DBH should be taken 1.3m above the ground during the March 14, 2025 monitoring of Hill 394 Forest*

***Plate 4**. (Left) MSG personnel, Ms. Rosalie Roque and Mr. June Diago taking the GPS coordinates of the central tree in one of the monitoring plots and (left) Ms. Lourdes dela Cruz filling out the data form as Mr. Luis Florentino provides the measurement during the March 28, 2025 monitoring of Pamulaklakin Forest*