Coral Bay Nickel Corporation

CERTIFICATION INTERNATIONAL ISO 9001:2015 — JAB Accredited QMS Certification Body Accreditation No: MSA-001

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DATE : September 21, 2021

FOR : **ENGR. WILLIAM P. CUÑADO**
Director
ENVIRONMENTAL MANAGEMENT BUREAU
DENR Compound, Visayas Ave.,
Diliman, Quezon City

Attention: **ENGR. ESPERANZA A. SAJUL**
Chief, Environmental Impact Assessment and Management Division

FROM : **BENJAMIN ARMAND A. TANSINGCO**
VP-Environmental Management

SUBJECT : **Report on the 2020 Flora Monitoring Report of the HPP Project Site**

Dear Director Cuñado:

We are submitting herewith to your office the "Flora Assessment of Hydrometallurgical Processing Site" for the Year 2020 in compliance to the EMoP of the December 2018 Environmental Performance Report and Management Plan (EPRMP) of Coral Bay Nickel Corporation. The field investigation for this study was conducted last October 28-30, 2020 by Petrosphere Incorporated led by Dr. Rodolofo O. Abalus and Dr. Ramon M. Docto.

We shall take note of the recommendations made by the assessment team on the monitoring report and will make our best effort to implement those that are possible for our company to undertake.

Thank you very much.

Very truly yours,

BENJAMIN ARMAND A. TANSINGCO
VP- Environmental Management

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FLORA ASSESSMENT OF HYDROMETALLURGICAL PROCESSING PROJECT SITE

DECEMBER 2020

Coral Bay Nickel Corporation

RIO TUBA, BATARAZA, PALAWAN

Flora Assessment of Hydrometallurgical Processing Site

A Terrestrial Ecology Monitoring Report

December 2020

Prepared for

Coral Bay Nickel Corporation

Rio Tuba, Bataraza, Palawan

By

PETROSPHERE™ INCORPORATED *A Training, Review & Consultancy Company*

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Executive Summary

The flora assessment within Coral Bay Nickel Corporation MPSA is part of the environmental compliance and corporate responsibility of the company. It is a regular assessment and monitoring activity on the existing flora within the impacted areas of its Hydrometallurgical Processing Project. This has been carried out for about 15 years since its start in 2005. This is a strong manifestation of the company's strict adherence to the principles of sustainable development, a development that complements economic activities with environmental protection and conservation.

This was carried out mainly to assess and monitor the vegetation structure of existing forest cover found in within and adjacent vicinities of the Hydrometallurgical Processing Plant Project of the Coral Bay Nickel Corporation. Specifically, it intended to: identify and classify the flora species composition of terrestrial sites within and adjacent areas; assess the biodiversity of these areas based on their species and population structural parameters; assess the impacts of HPP activities and its continuous operations to the ecology of the site; determine the conservation status of flora in the sites; and recommend flora conservation and protection measures.

The sampling sites are generally secondary forest growth, grassland and brushlands which are mainly attributed to the ultramafic nature of the soil in the area. The flora assessment field validation was conducted last October 28-30, 2020. New observations sites were established at Tailings Storage Facility (TSF 1) including TSF 3 and at Nagoya Beach. TSF 1 is a product of a progressive rehabilitation done by the CBNC management. It has effectively displayed a successful rehabilitation of mine tailings impoundment or mined out areas by converting them into stable manmade forest ecosystem. Monitoring site 3 (Nagoya Beach) also demonstrates an effort of reforestation is a good environmental initiative along the shoreline with thriving thick forest cover, indicating a healthy mangrove forest ecosystem.

Assessment results over Ibelnan, Kinurong Siltation Pond, Magas-Magas, Mt. Bulanjao, and TSF 3 monitoring sites showed 546 individuals recorded belonging to 70 different tree species and 34 families. At the understorey level, a total of 84 plant species were identified, belonging to 51 families. *Xanthostemon speciosus* commonly known as Palawan Mangkono is the most dominant tree species with recorded importance value of 47.27% followed by *G. rumphianum* (Mountain Agoho) with 23.14%. Sampling site 8 or TSF 3 had a low diversity index at 2.409 while sites 1, 2, 4 and 5 had moderate diversity index at 2.703, 2.661, 2.888, 2.760 and 2.409, respectively.

The overall diversity index of monitoring sites was estimated at 2.684 which is described as moderately diverse. The overall evenness on the other hand was estimated at 0.002, which is very low indicating that the number of individuals of tree species were highly variable with only few species having number of individuals dominating the monitoring areas. These results were attributed mainly to the soil characteristics of the sampling sites being ultrabasic, a soil deficient of essential minerals to support growth and development of plants/trees. Ultrabasic or ultramafic soil environment is dominated by elements which are toxic to most plants.

Among the 70 tree species encountered, *E. longifolia* and *V. parviflora* were considered endangered while *C. pentapetalum, D. luzoniensis, D. monantha,* and *D. philosanthera* are vulnerable based on the updated list of threatened flora species under PCSD Resolution No. 15-521. The rest of the remaining species were considered as non-threatened.

Enrichment planting through assisted natural regeneration should be done in order to increase tree species evenness. Identified endangered and vulnerable species should be prioritized as planting materials for enrichment planting and in rehabilitating mined out areas as measures to conserve them.

Designation of a separate and wider area that has an array of resources, physical and biotic factors that could allow the survival and reproduction of those identified threatened flora species for their protection and conservation must be implemented.

Certification

This Flora Assessment of Hydrometallurgical Processing Plant was prepared in accordance with the requirements from DENR as stipulated in the environmental compliance certificate and as part of the company's environmental monitoring program.

Signed:

RODOLFO O. ABALUS JR., PhD

RAMON M. DOCTO, PhD

I. Introduction

A. BACKGROUND

The Coral Bay Nickel Corporation always subscribes to the tenets of sustainable development. It is a development that complements both economic and natural resource conservation, where development activities support environmental protection.

Various environmental protection and enhancement research and development programs have been developed and put in place by the company since the start of its operation in year 2005. The periodic monitoring schemes to assess the impacts of the company's operations on the social as well as on biological and physical environment, and utilizing the information being derived thereat for the development of management measures to maintain ecological balance were some of the measures it has instituted in its management system to attain sustainability.

This document contains the flora assessment report for the Hydrometallurgical Processing Plant (HPP) project sites of CBNC. Field validation was conducted on October 28-30, 2020.

B. OBJECTIVES

1. General

The main aim of this study is to assess and monitor the vegetation structure of existing forest cover found in within and adjacent vicinities of the Hydrometallurgical Processing Plant Project of the Coral Bay Nickel Corporation in Rio Tuba, Bataraza, Palawan.

2. Specific

The assessment was conducted in order to meet the following specific objectives:

1. Identify and classify the flora species composition of terrestrial sites within and adjacent areas;
2. Assess the biodiversity of these areas based on their species and population structural parameters;
3. Assess the impacts of HPP activities and its continuous operations to the ecology of the site;
4. Determine the conservation status of flora in the sites; and
5. Recommend flora conservation and protection measures.

C. IMPORTANCE

Environmental monitoring is an integral part of CBNC's commitment to environmental laws and regulations. Better monitoring of the environment in which the company is operating can have a significant and positive impact at the bottom line. By understanding of what is happening, the company can make better decisions on its own environmental policies, regulations, and programs.

Flora assessment of Coral Bay Nickel Corporation is a management strategy which intends to measure the impacts of the hydrometallurgical processing plant operations to the immediate or adjacent natural and man-made terrestrial forest ecosystems. This endeavor provides baseline quality, uncover environmental trends, identify any variations, determine the success of projects and confirm whether or not environmental goals and targets have been attained.

Assessment results on floral composition of forest ecosystems provide information on the positive or negative effects of the Company's operations on the adjacent natural and other forest ecosystems. This would also provide actual data necessary to determine if the company is religiously implementing established policies, laws, rules, and guidelines towards sustainable management of the area.

II. Methodology

A. DESCRIPTION OF THE PROJECT SITE

1. The Host Municipality

The HPP project site of CBNC is hosted by the municipality of Bataraza, a first-class municipality located in the southern portion of mainland Palawan. It has an approximate total land area of 726.20 sq. km. It is bounded in the east by the Sulu Sea, in the west by a great mountain range extending from Mount Mantalingahan (the highest peak in the province) to Mount Malitub, which serves as the divider between Bataraza and Rizal, and in the south-west by the West Philippine Sea. Bataraza's topography is hilly with rugged mountains mostly covered by forest.

Rugged to gently undulating terrain distinguishes most part of Bataraza. The highest land feature in the area is the north-northeast trending Bulanjao Range, which is located at the central portion of the municipality. The land slopes down to western and eastern coastlines. Steep slopes and sharp peaks characterize the Bulanjao Range whose ridgeline averages 900 meters above sea level (masl). Its highest point is the Escapardo Peak which rises to 1,036 masl. Ultramafic and volcanic rocks underline the Bulanjao Range.

The Hydrometallurgical Processing Plant covers Barangays of Rio Tuba, Ocayan and Taratak in Bataraza, Palawan.

2. Accessibility

HPP project site is accessible from Manila via private or commercial aircraft with 1-hour travel time or through passenger ship with 22-hour travel time to Puerto Princesa City. It is approximately 225 kilometers from Puerto Princesa City (**Figure 1**). Land travel to Bataraza takes about 5 hours via south road passing through the municipalities of Aborlan, Narra, Sofronio Espanola and Brooke's Point. Bus companies and commercial or public utility vans serve as transport means for the general public.

3. The Hydrometallurgical Processing Plant

The Hydrometallurgical Processing Plant of Coral Bay Nickel Corporation is located within the Rio Tuba Nickel Mining Corporation (RTNMC) mine areas in barangay Rio Tuba, Bataraza, Palawan. The HPP plant for nickel uses the high-pressure acid leaching technology. It includes support facilities such as hydrogen sulfide production plant, limestone quarrying operations and causeway/trestle facilities at the pier area. Limestone quarry is owned and managed by RTNMC.

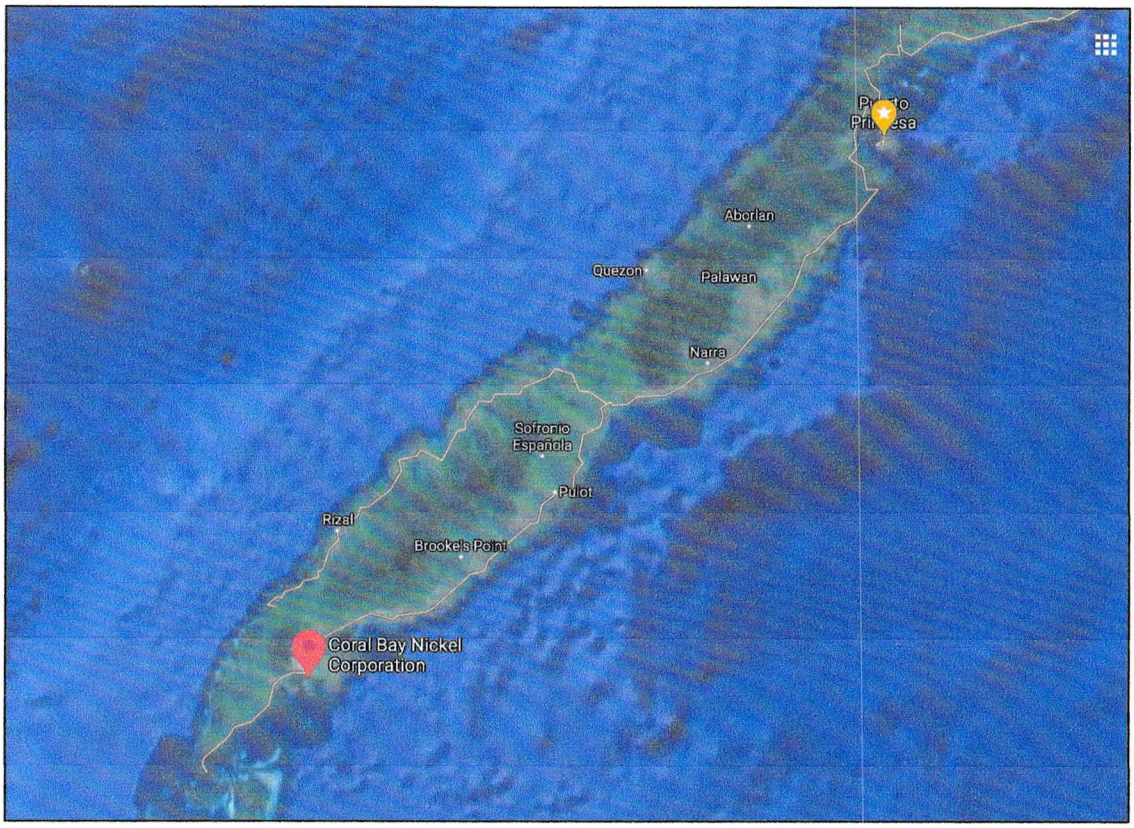

Figure 1. Location Map of Coral Bay Nickel Corporation (Source: google.com.ph).

B. BACKGROUND OF HPP PROJECT VEGETATION COVER SAMPLING SITES

Implementation of the flora monitoring and assessment at the HPP project site for 2020 is on its 15th year. The activity is regularly carried out to better monitor the surrounding environment where the project will have significant and positive impact at the bottom line. In this way, the company can make better decisions on its own environmental policies, regulations and programs.

Based on the Environmental Impact Statement prepared in 2001, sampling stations for vegetation assessment have been identified as follows: a) limestone quarry, b) tailings pond, c) power plant, d) water and acid pipeline, and e) water impounding dam at East and West Ibelnan. These are the direct impact areas brought by the operations of the project. The components of the project include i) the construction and operation of a hydrometallurgical processing plant, ii) limestone quarry, iii) installation of water supply and drainage system, iv) construction of tailings dam, and v) installation of a power plant.

The first monitoring activity for vegetation was conducted on December 2005. The team employed the standardized method of data collection. Monitoring plots were established on the basis of impact areas with vegetation. The plots were geographically located. Generally, the type and number of species during as indicated in the EIS 2001 and 2005 monitoring were varied depending

2. Sample Plots

For each sampling site, established permanent sampling plots with dimensions of 10 meters by 10 meters were tracked on the ground. Under each plot, one (1) 1 m X 1m subplot was also established. Detailed sketch of flora monitoring stations is shown in **Figure 2.**

Coordinates and elevation of the center of each plot were recorded (**Table 1**) through the Global Positioning System (GPS). Plot centers were marked with red ribbon as reference. Data gathered were translated in the map through GIS.

Table 1. Technical description of the flora sampling sites.

Site	Site/Plot	Coordinates		Elevation (m)
		Northing	Easting	
1A Ibelnan	Site 1 Plot 1	8°34'08.9"	117°23'37.5"	115
	Site 1 Plot 2	8°34'16"	117°23'35"	127
	Site 1 Plot 3	8°34'23"	117°23'37"	87
	Site 1 Plot 4	8°34'33"	117°23'32.4"	173
	Site 1 Plot 5	8°34'45.2"	117°23'24"	248
Kinurong Siltation Pond Area	Site 2 Plot 1	8°33'21.6"	117°24'58.7"	19
	Site 2 Plot 2	8°33'23.9"	117°25'3.8"	39
	Site 2 Plot 3	8°33'17.9"	117°25'16"	24
	Site 2 Plot 4	8°33'19.2"	117°25'21"	31
	Site 2 Plot 5	8°33'20.7"	117°25'26.6"	32
TSF 1	Rehabilitation area	8°34'01.1"	117°25'20.9"	62
TSF 3	Site 8 Plot 1	8°34'38.7"	117°25'59.7"	28
	Site 8 Plot 2	8°34'37.5"	117°26'01.5"	30
	Site 8 Plot 3	8°34'34.1"	117°26'02.1"	32
	Site 8 Plot 4	8°34'40.4"	117°25'59.8"	27
	Site 8 Plot 5	8°34'37.7"	117°26'05.6"	29
Magas-Magas	Site 4 Plot 1	8°34'11"	117°23'53"	94
	Site 4 Plot 2	8°34'08.4"	117°23'54.8"	87
	Site 4 Plot 3	8°34'08.3"	117°23'56.6"	91
	Site 4 Plot 4	8°34'12.1"	117°23'56.4"	92
	Site 4 Plot 5	8°34'14.6"	117°23'59"	97
Mt. Bulanjao	Site 5 Plot 1	8°33'50"	117°22'24.4"	504
	Site 5 Plot 2	8°33'44.1"	117°22'32.6"	456
	Site 5 Plot 3	8°33'47"	117°22'42"	412
	Site 5 Plot 4	8°33'44.4"	117°22'50"	351
	Site 5 Plot 5	Impenetrable due to a biohazard		
	Site 5 Plot 6	8°33'38.8"	117°22'50.9"	324
	Site 5 Plot 7	8°33'35"	117°22'53.1"	298
	Site 5 Plot 8	8°33'35"	117°22'58"	257
	Site 5 Plot 9	8°33'41.2"	117°23'09.5"	255
	Site 5 Plot 10	8°33'40.4	117°23'03.5"	228
	Site 5 Plot 11	8°33'39.5	117°23'07.1"	203
	Site 5 Plot 12	8°33'38.6"	117°23'17.7"	179
	Site 5 Plot 13	8°33'45.7"	117°23'12.6"	145

on the number and size of plots established in the area. Findings on species composition and diversity were different.

The 2005 monitoring was composed of five (5) sites namely Ibelnan area, Kinurong silt containment pond, Supernatant water and acid pipelines at Nagoya coast and plantations near the intake dam, Ibelnan resort and water reservoir. The said water reservoir was improved for other purposes few months before the 2006 monitoring.

In 2006, monitoring, the Mt. Bulanjao forest was included in the monitoring areas. During 2007 monitoring, tailings dam 2 was included in the observation area and a separate preliminary report was made. In 2008, vegetation of the tailings dam and nearby covering Magas-Magas and Mangingidong pit was included in the assessment. The Magas-Magas siltation pond was the first pond to handle silts at the western area of the mine site, and three huge mine wastes stockpile which were considered as feed material for the HPP of CBNC. Generally, the area was constructed as allowed in the ECC of the expanded operations.

At present, a big portion of the stockpiles have been taken out and relocated to favor the start of the construction of TSF2's embankment. An area downstream was also opened up and used a preparation area for the core materials needed in the embankment and also to locate the equipment maintenance shops, geotechnical laboratories and offices. Prior to the opening of these areas, a team from PENRO/CENRO conducted a survey and gave clearance for the removal of trees smaller than 10cm diameter, which comprise about 70% of the inventory. The remaining bigger trees were not disturbed and those that cannot be avoided had to be removed and will be compensated by planting 50 trees for every tree cut in a new reforestation area. This will be done after the completion of the TSF 2 construction.

Since 2008, monitoring tailings dam 1 was excluded in the sampling site. The plots then in all sampling sites were permanently established and visited annually. In 2012, the Ursula Island was included in monitoring areas as requested by DENR-CENRO Brooke's Point and suggested for a 100 % timber inventory. The 2013 monitoring considered tailings dam 2 as observation areas. In 2016, all sampling and observation areas were monitored including Ursula Island. Additional sampling site was included in the forest area near Magas-Magas in 2017.

C. ASSESSMENT OF FLORAL COMPONENTS OF FOREST ECOSYSTEMS

1. Permanent Sampling Sites

Permanent and existing sampling sites were identified on the map and located on the ground with the purpose of assessing or monitoring the floral components of the different forest and other vegetated ecosystems adjacent to the HPP project site. The sample sites include Site 1A - Ibelnan, Site 2 - Kinurong Silt Pond, Site 4 – Magas-Magas, Site 5 - Mt. Bulanjao, and the observation area in TSF 1. Sampling site 8 - TSF 3 is newly added area for monitoring. All sampling sites representing various vegetation cover classes such as natural forest stand, forest cover between secondary and brushland areas, rehabilitated and observation areas were considered.

3. Data Gathered

Characterization of the sites within the HPP project vicinity were done within the sample plots. The species composition under each 10 m X 10 m plot were identified and recorded. Trees with 5 cm diameter at breast height (DBH) and above were measured. All plants and individuals below 5 cm DBH located inside the 1m X 1m subplot were also identified, counted and recorded. Significant species of understorey vegetation were also noted. Sample plant specimens needing further identification were brought to Palawan State University herbarium for proper identification and preservation.

The flora monitoring team were accompanied and assisted by CBNC Environmental Management staff during the whole duration of the flora assessment activity.

4. Data Analysis

The different flora species encountered within plots were identified and classified according to their local or common name, species, genus, and family name.

Importance value, species diversity, and evenness indices of all trees encountered within sampling sites were determined excluding those at TSF 1 which is a manmade forest and is only considered as an observation site. Estimation of the above forest structure indicators were based on the following equations:

a. Relative Dominance

Relative dominance is the number of individuals per area as a percent of the number of individuals of all species (Equation 1).

$$\text{Relative Dominance} = \frac{a}{\sum BA} \times 100 \qquad \text{Equation 1}$$

Where: a - Basal area of a species
$\sum BA$ - Summation of basal area of all species within a community

b. Relative Frequency

Relative frequency is the percent of inventory points occupied by species A as a percent of the occurrence of all species (Equation 2).

$$\text{Relative Frequency} = \frac{NP}{TP} \times 100 \qquad \text{Equation 2}$$

Where: NP - Number of plots
TP - Total plots

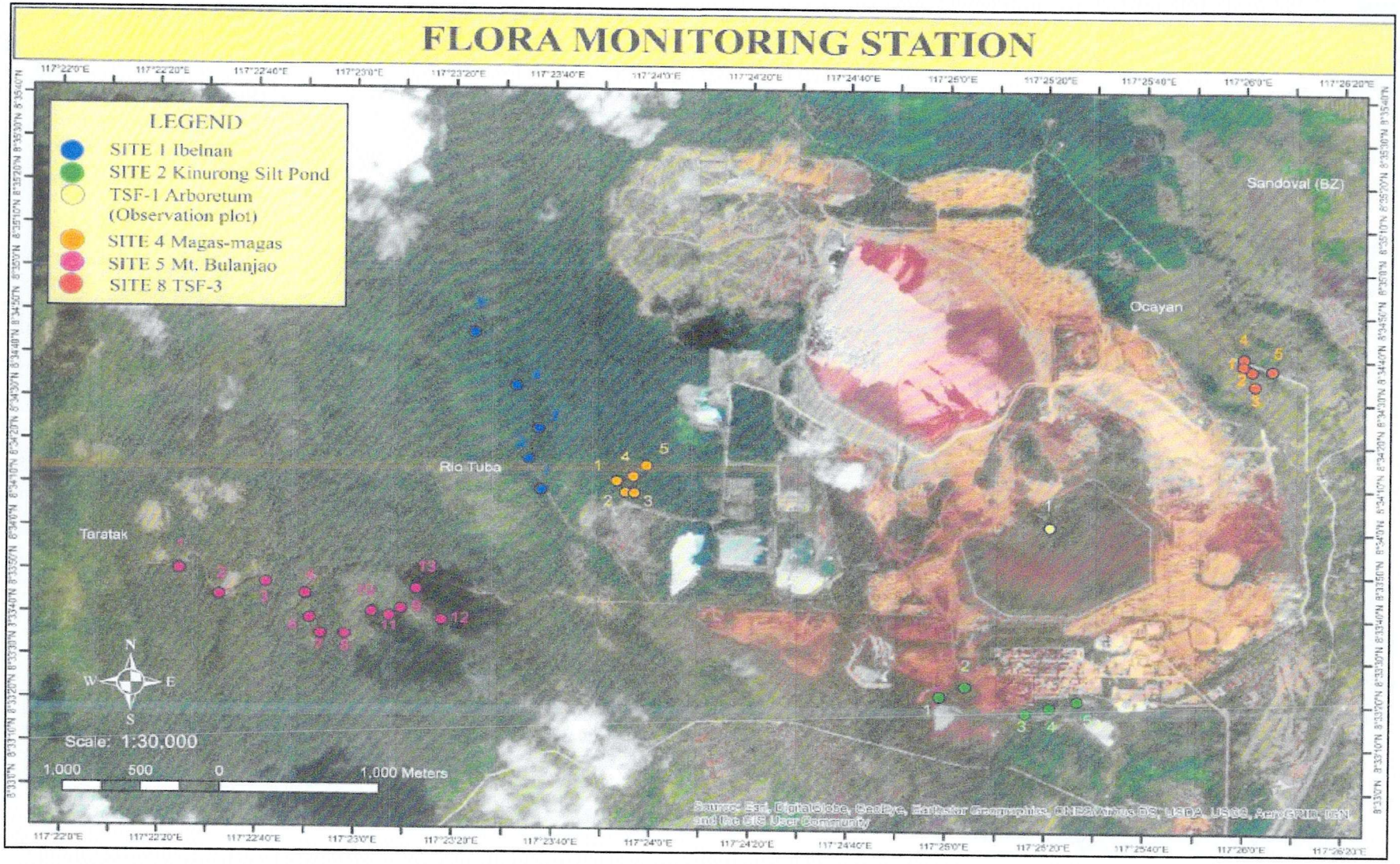

Figure 2. Flora assessment sampling sites.

c. Relative density

Relative density is the total number of individuals of a species as a percent of the total individuals of all species (Equation 3).

$$\text{Relative Density} = \frac{D}{\sum DS} \times 100 \qquad \text{Equation 3}$$

Where: D - Number of individuals of a species
- Total individuals of all species

d. Importance Value

Importance value is a measure of how dominant a species is in a given community. The importance value is the sum of these three measures (relative dominance, frequency, and density), and can range from 0 to 300. A high importance value indicates that Species A is well represented in the stand because of some combination of a) a large number of individuals of Species A compared with other species in the stand, or b) a smaller number of individuals of Species A, but the trees are large compared with others in the stand.

$$\text{Importance Value} = RD_o + RF + RD_e \qquad \text{Equation 4}$$

Where: RD_o - Relative dominance
RF - Relative frequency
RD_e - Relative density

e. Diversity Index

The Shannon Diversity Index (H) was used to calculate population density, abundance and richness of the species. This is an information statistic index which means through assumptions based on the input information that all species are represented in a sample and that they are randomly sampled. Further, this is the mathematical measure of species diversity in a given community of fauna in the sampling sites. This provides more information about the community composition than simply species richness that also take the relative abundances of different species into account.

Diversity index (Equation 5) also known as phylogenetic indices or phylogenetic metrics is a quantitative measure that reflects how many different types of species there are in a community and that can simultaneously take into account the phylogenetic relations of the individuals distributed among those types, such as richness, divergence or evenness. The Shannon's diversity index was applied in this assessment as shown in the below equation (Equation 5).

$$H' = \sum_{i=1}^{s} - (Pi * \ln Pi) \qquad \text{Equation 5}$$

Where: H' = the Shannon diversity index
Pi = fraction of the entire population made up of species i
S = number of species encountered
$\sum$ = sum from species 1 to species S

f. Evenness Index

Evenness is the count of individuals of each species in an area. Species evenness is important to biodiversity because it gives an indication of the stability of an ecosystem. Evenness is high if all species have similar distribution (i.e., similar population density) (Baker and Savage, 2008)

$$\text{Pielou's Evenness Index (J')} = \frac{H}{\ln(S)} \qquad \text{Equation 6}$$

Where: H' = the Shannon diversity index
ln = natural logarithm
S = total number of species

The estimated Shannon's diversity and Pielou's Evenness indices were rated based on the Fernando diversity scale as shown in **Table 2**.

Table 2. Shannon's diversity and Pielou's Evenness indices rating

Diversity Index (H')	Evenness Index (J')	Rating
1.0-1.99	0.05-0.14	Very low
2.0 - 2.49	0.15-0.24	Low
2.5-2.99	0.25-0.49	Moderate
3.0 - 3.49	0.50-0.74	High
$\geq$ 3.5	0.75-1.00	Very high

e. Conservation Status

The conservation status of flora found in the sites were determined based on the PCSD resolution 15-521 updated list of terrestrial and marine wildlife in Palawan and their categories. Comparative analysis on the species composition and ecological structure of identified study sites, as well as the visible ecological impacts of mining activities and operations of other sites in Palawan with similar biophysical conditions were also done based on actual observations during transect surveys.

III. Results and Discussion

A. LAND COVER CLASSES

The sampling sites are generally second growth forest, grassland, and brushlands. This is attributed to the ultramafic nature of the soil in the area. The forested areas in Site 1A - Ibelnan and Site 5 - Mt. Bulanjao were mixed hardwoods and can be generally classified as "ultramafic mixed hardwood species" (Castillo et al., 2019). The sampling sites elevation ranged from 19 masl (Site 2 - Kinurong siltation pond) to 504 masl in (Site 5 - Mt. Bulanjao).

The terrain for sampling site 1A - Ibelnan is generally flat to rolling with elevation ranging from 87 masl-248 masl and dominated by natural forest vegetation. Sampling site 2 - Kinurong siltation pond area is general flat to slightly rolling with an elevation between 19 masl to 39 masl. Vegetation is natural forest to secondary growth. Sampling site at TSF 1 is a reforested area with terrain described as generally flat and situated at an elevation of 62 masl. Sampling site 4 - Magas-Magas has a generally flat terrain, elevation of 87 masl to 97 masl, and covered with natural forest with brushland ecosystem. Sampling site 5 - Mt. Bulanjao is rolling to rugged terrain with signs noted signs of erosion, elevation ranging from 145 masl to 504 masl, and covered with secondary to primary forest.

B. TREE SPECIES COMPOSITION

1. Site 1A - Ibelnan

The vegetation cover of Sampling site 1A – Ibelnan is comprised with a total of 25 tree species (**Table 3**). Out of this total number of species encountered, 24 of them belong to 16 families which include Apocynaceae, Araliaceae, Burseraceae, Casuarinaceae, Chrysobalanaceae, Dilleniaceae, Ebenaceae, Euphorbiaceae Guttiferae, Magnoliaceae, Myrtaceae, Ochnaceae, Pittosporaceae, Rubiaceae, Sapindaceae and Sapotaceae. However, 1 species was only identified at local/common name level, Masok Masok. Specimens were collected for further identification at the College of Sciences Museum of Natural History of the Palawan State University.

Table 3. Tree species encountered at site 1A.

No.	Family Name	Scientific Name	Common/Local Name
1	Apocynaceae	*Alstonia macrophylla*	Batino/kurayan
2	Araliaceae	*Arthrophyllum ahernianum*	Dokloi
3	Burseraceae	*Protium connarifolium*	Marangub
4	Casuarinaceae	*Gymnostoma rhumpianum*	Mt. Agoho
5	Chrysobalanaceae	*Licania splendens*	Amayan
6	Dilleniaceae	*Dillenia monantha*	Katmon Bugtong
7	Dilleniaceae	*Dillenia luzoniensis*	Malakatmon

Table 3 continued...

No.	Family Name	Scientific Name	Common/Local Name
8	Ebenaceae	*Diospyrus sp.*	Tandikan
9	Ebenaceae	*Diospyrus philosanthera*	Kanomay/bolong-eta
10	Euphorbiaceae	*Drypetes sp.*	Ranta Ranta
11	Guttiferae	*Calophyllum blancoi*	Palomaria/Bitanghol
12	Guttiferae	*Callophylum pentapetalum*	Pamitoyen
13	Magnoliaceae	*Talauma villariana*	Patangis
14	Magnoliaceae	*Magnolia borneensis*	Maglandak/Palawan Patangis
15	Magnoliaceae	*Magnolia grandiflora*	Magnolia
16	Myrtaceae	*Xanthostemon speciosus*	Palawan Mangkono
17	Ochnaceae	*Brakenridgea palustris*	Brakenridgea
18	Pittosporaceae	*Pittosporum pentandrum*	Mamalis
19	Rubiaceae	*Timonius arboreus*	Mabalod
20	Rubiaceae	*Canthium dicoccum*	Malakape
21	Rubiaceae	*Psychotria luzoniensis*	Tagpong gubat/Suwakaw
22	Rubiaceae	*Rothmania merilii*	Bagaay
23	Sapindaceae	*Euphoria didyma*	Alupag
24	Sapotaceae	*Planchonella foxworthyii*	Alalud
25			Masok Masok

2. Site 2 - Kinurong Siltation Pond

Table 4 shows the tree species composition encountered in sampling site 2 – Kinurong siltation pond. The site was comprised of 28 tree species belonging to 22 families. Of the total families where the tree species were classified, 5 families had 2 species each such as Araliaceae, Lamiaceae, Leguminosae and Moraceae. The rest of the families were represented by single species each to include Annonaceae, Apocynaceae, Burseraceae, Chrysobalanaceae, Clusiaceae, Ebenaceae, Elaeocarpaceae, Euphorbiaceae, Fabaceae, Guttiferae, Lauraceae, Loganiaceae, Malvaceae, Meliaceae, Myrsinaceae, Myrtaceae, Pittosporaceae, Rubiaceae, Sapotaceae, and Verbenaceae.

Table 4. Tree species encountered at sampling site 2.

No.	Family	Scientific Name	Local Name
1	Annonaceae	*Mezzettiopsis creaghii*	Tabingalang
2	Apocynaceae	*Alstonia macrophylla*	Batino/kurayan
3	Araliaceae	*Arthrophyllum ahernianum*	Dokloi
4	Araliaceae	*Polyscias nodosa*	Malapapaya
5	Burseraceae	*Canarium Asperum*	Sahing/Pagsahingin
6	Chrysobalanaceae	*Licania splendens*	Amayan

Table 4 continued...

No.	Family	Scientific Name	Local Name
7	Ebenaceae	*Diospyrus sp.*	Tandikan
8	Elaeocarpaceae	*Eleaocarpus cumingii*	Katap/Pasi pasi/Hunggo
9	Euphorbiaceae	*Macaranga tanarius*	Binunga
10	Fabaceae	*Acacia Auriculiformis*	Japanese Acacia
11	Guttiferae	*Cratoxylum formosum*	Salingogon
12	Guttiferae	*Calophyllum blancoi*	Palomaria/Bitanghol
13	Lamiaceae	*Gmelina arborea*	Gmelina/Yemane
14	Lamiaceae	*Vitex pubescens*	Molawin mabuhok
15	Lauraceae	*Neolitea vidalli*	Puso Puso
16	Leguminosae	*Albizia saponaria*	Salingkugi
17	Leguminosae	*Intsia bijuga*	Ipil
18	Loganiaceae	*Fagraea fragrans*	Dulo/dolo
19	Malvaceae	*Commersonia bartramia*	Kakaag
20	Meliaceae	*Swietenia macrophylla*	Mahogany
21	Moraceae	*Artocarpus blancoi*	Antipolo
22	Moraceae	*Ficus sp.*	Ficus ulmifolia
23	Myrtaceae	*Syzygium aqueum*	Tambis
24	Pittosporaceae	*Pittosporum pentandrum*	Mamalis
25	Rubiaceae	*Canthium dicoccum*	Malakape
26	Rubiaceae	*Psychotria luzoniensis*	Tagpong Gubat/Suwakaw
27	Sapotaceae	*Palaquim luzonensis*	Aripa/Nato
28	Verbenaceae	*Vitex parviflora*	Molave/Mulawin

3. Site TSF 1

The whole of TSF 1 is an old plantation with some trees planted in the area since 2013. The TSF-1 as a rehabilitation covered roughly 80 hectares of its embankment and impoundment area. Since 2013, re-vegetation has been done and tree species in the area has increased over the years; thus, an increase in species richness of flora. The following are the vegetation planted in TSF-1.

1. At least 110,000 of trees are growing sustainably in the whole area as of 3rd quarter of 2020.
2. An established 10,000-square meter Arboretum area, with a total of 150 native tree species found in the nearby forest surrounding the mineral processing plant.
3. High value crops plantation to show that a rehabilitated TSF can sustain agricultural activities. Crops like coconut is now on its fruit-bearing stage. Other products are vegetables, papaya, banana, pineapple and dragon fruit. Native fruit trees like guava, bignay, kamansi, duhat, and guyabano and avocado are all flourishing in TSF-1 giving fruits and food to sustain birds and other fauna in the area.

4. An Analogue Forest of about 900 square meters is developed in TSF-1. It is a replica of a good forest cover, that was chosen in the Magas-magas area. The replica or analogue forest is found successfully growing in the tailings soil of TSF-1 with an average of 9-centimeter diameter at DBH and an average height of 3 meters.

5. Other plants are found in TSF-1 include bamboo plantation as required by MGB to establish pandan plantation, Orchids, flower and herbal gardens.

4. Site 4 - Magas - Magas

Site 4 – Magas-Magas area as shown in **Table 5** is comprised with a total of 22 tree species which were distributed to 16 families to include Anacardiaceae, Araliaceae, Burseraceae Chrysobalanaceae, Elaeocarpaceae, Guttiferae, Lauraceae, Leguminosae, Magnoliaceae, Myristicaceae, Myrtaceae, Rubiaceae, Rutaceae, Sapindaceae, Sapotaceae, and Simaroubaceae. Two (2) species were identified only through their local names Maglunawan and Balinto.

Table 5. Tree species encountered at sampling site 4.

No.	Family Name	Scientific Name	Common/Local Name
1	Anacardiaceae	*Buchannania microphylla*	Bokanana/Palinlin
2	Araliaceae	*Arthrophyllum ahernianum*	Dokloi
3	Araliaceae	*Polyscias nodosa*	Malapapaya
4	Burseraceae	*Protium connarifolium*	Marangub
5	Chrysobalanaceae	*Maranthes corymbosa*	Liusin
6	Elaeocarpaceae	*Eleaocarpus cumingii*	Katap/Pasi pasi/Hunggo
7	Guttiferae	*Ochrocarpus ramiflorus*	Bitok
8	Guttiferae	*Calophyllum blancoi*	Palomaria/Bitanghol
9	Lauraceae	*Cinnamomum mercadoi*	Sinamoman/ Kalingag
10	Leguminosae	*Albizia saponaria*	Salingkugi
11	Leguminosae	*Mimosa sp.*	Diklay
12	Magnoliaceae	*Talauma villariana*	Patangis
13	Myristaceae	*Gymnacranthera paniculata*	Anuping
14	Myrtaceae	*Syzygium sp.*	Wild Tambis
15	Myrtaceae	*Syzygium aqueum*	Tambis
16	Rubiaceae	*Canthium dicoccum*	Malakape
17	Rutaceae	Achronesia pedunculata	Marangkukutan
18	Sapindaceae	*Euphoria didyma*	Alupag
19	Sapotaceae	*Palaquim luzonensis*	Aripa/Nato
20	Simaroubaceae	*Eurycoma longifolia*	Linatog/Tonkat Ali
21			Maglunawan
22			Balinto

5. Site 5 - Mt. Bulanjao

The Mt. Bulanjao site had 34 identified tree species belonging to 21 families such as Anacardiaceae, Annonaceae, Apocynaceae, Araliaceae, Burseraceae, Casuarinaceae, Dilleniaceae, Elaeocarpaceae, Fabaceae, Guttiferae, Lamiaceae, Lauraceae, Leguminosae, Magnoliaceae, Moraceae, Myrtaceae, Rubiaceae, Rutaceae, Sapotaceae, Simaroubaceae and Sterculiaceae (**Table 6**). However, 3 tree species were identified only at their local or common name level, Maglunawan, Talilisan and Magpango.

Table 6. Tree species encountered at sampling site 5.

No.	Family Name	Scientific Name	Common/Local Name
1	Anacardiaceae	*Swintonia foxworthyi*	Apitong babui/Rimaraw
2	Anacardiaceae	*Buchanania arborescens*	Balinghasai
3	Anacardiaceae	*Buchannania microphylla*	Bokanana/Palinlin
4	Annonaceae	*Licania splendens*	Amayan
5	Anonaceae	*Mezzettiopsis creaghii*	Tabingalang
6	Apocynaceae	*Alstonia macrophylla*	Batino/kurayan
7	Apocynaceae	*Alstonia scholaris*	Dita
8	Araliaceae	*Arthrophyllum ahernianum*	Dokloi
9	Burseraceae	*Protium connarifolium*	Marangub
10	Casuarinaceae	*Gymnostoma rumphianum*	Mt. Agoho
11	Dilleniaceae	*Dillenia Luzoniensis*	Malakatmon
12	Elaeocarpaceae	*Eleaocarpus cumingii*	Katap/Pasi pasi/Hunggo
13	Fabaceae	*Achidendron clypearia*	Tiagkot
14	Guttiferae	*Calophyllum pentapetalum*	Pamitoyen
15	Guttiferae	*Calophyllum blancoi*	Palomaria/Bitanghol
16	Guttiferae	*Garcinia sp.*	Malatambis
17	Lamiaceae	*Premna depauperata*	Alagau
18	Lauraceae	*Cinnamomum mercadoi*	Sinamoman/Kalingag
19	Leguminaseae	*Mimosa sp.*	Diklay
20	Leguminosae	*Albizia saponaria*	Salingkugi
21	Magnoliaceae	*Talauma villariana*	Patangis
22	Magnoliaceae	*Magnolia borneensis*	Maglandak/Palawan Patangis
23	Moraceae	*Ficus Bataanensis*	Bataan Fig
24	Myrtaceae	*Xanthostemon speciosus*	Palawan Mangkono
25	Myrtaceae	*Syzygium sp.*	Wild Tambis
26	Rubiaceae	*Timonius arboreus*	Mabalod
27	Rutaceae	*Achronesia pedunculata*	Marangkukutan
28	Sapotaceae	*Palaquim luzonensis*	Aripa/Nato
29	Sapotaceae	*Pouteria micrantha*	Marapasi
30	Simaroubaceae	*Eurycoma longifolia*	Linatog/Tonkat Ali

Table 6. continued...

No.	Family Name	Scientific Name	Common/Local Name
31	Sterculiaceae	*Colona discolor*	Magbanotan
32			Maglunawan
33			Talilisan

6. Site 8 - TSF 3

Table 7 shows that Site 8 – TSF 3 is comprised of 15 tree species. Thirteen (13) of these belong to 12 families. Guttiferae has 3 family tree species while Anacardiaceae has 2. On the other hand, families such as Apocynaceae, Clusiaceae, Chrysobalanaceae, Elaeocarpaceae, Lamiaceae, Loganiaceae, Myrsinaceae, Phyllanthaceae, Rutaceae and Verbenaceae had only 1 species each.

Table 7. Tree species encountered at CBNC flora sampling site 8 TSF 3.

No.	Family Name	Scientific Name	Common/Local Name
1	Anacardiaceae	*Buchanania arborescens*	Balinghasai
2	Anacardiaceae	*Buchanania microphylla*	Bokanana/Palinin
3	Chrysobalanaceae	*Licania splendens*	Amayan
4	Apocynaceae	*Alstonia macrophylla*	Batino/kurayan
5	Clusiaceae	*Garcinia benthami*	Bunog
6	Elaeocarpaceae	*Eleaocarpus cumingii*	Katap/Pasi pasi/Hunggo
7	Guttiferae	*Cratoxylum formosum*	Salinggogon
8	Guttiferae	*Callophylum pentapetalum*	Pamitoyen
9	Guttiferae	*Ochrocarpus ramiflorus*	Bitok
10	Lamiaceae	*Premna depauperata*	Alagau
11	Loganiaceae	*Fagraea fragrans Roxb.*	Dulo/Dolo
12	Myrsinaceae	*Ardisia squamulosa*	Tagpo
13	Phyllanthaceae	*Glochidion coronulatum*	Kakaua
14	Rutaceae	*Achronesia pedunculata*	Marangkukutan
15	Verbenaceae	*Vitex parviflora*	Molave/Mulawin

7. Other flora observation sites

Nagoya Beach was identified as observation station number 1. A walk-through survey was conducted along its shoreline which is covered by mangrove forest. The area is composed of *Rhizophora apiculata* (bakawan lalaki), *Rhizophora mucronata* (bakawan bato), *Rhizophora stylosa* (bakawan babae), *Sonneratia alba* (Pagatpat), *Terminalia catappa* (Talisay), and Malabaho. Observation station number 2 is a reforestation area with a natural growth of *S. alba* (Pagatpat). Station number 3 is covered by a dense natural growth mangrove forest. On the other side of the shore is a banana plantation in a privately-owned lot. Trees in the area were Bogo, Balonsaging, Igyo, Talisay gubat, Calamansanay, Malaikno, Bansalagin, Tanglen and Amugis.

8. Summary of tree species in all sampling sites

Table 8 shows the summary of all tree species encountered within the 5 sites sampled. There were 70 tree species encountered belonging to 34 families. Of the total species, 5 were identified only by their local names. Specimens were obtained for their further identification at the Palawan State University Museum of natural history.

The family Guttiferae had 6 species and Myrtaceae and Rubiaceae with 4 species each, which were the highest. This was followed by families Anacardiaceae, Apocynaceae, Lamiaceae, Leguminosae, Lauraceae, Magnoliaceae and Moraceae, with 3 species each. Those families with 2 species each include, Chrysobalanaceae, Araliaceae, Burseraceae, Dilleniaceae, Ebenaceae, Euphorbiaceae, Fabaceae, Myrsinaceae, Sapotaceae. and Simaroubaceae. On the other hand, families such as Casuarinaceae, Chrysobalanaceae, Clusiaceae, Elaeocarpaceae, Loganiaceae, Malvaceae, Meliaceae, Myristicaceae, Ochnaceae, Pittosporaceae, Rutaceae, Sapindaceae, Sterculiaceae, and Verbenaceae had only single species each.

Table 8. Summary of tree species in all sampling sites.

No.	Family Name	Scientific Name	Common/Local Name
1	Anacardiaceae	*Buchanania Macrophylla*	Bokanana/Palinlin
2	Anacardiaceae	*Buchanania arborescens*	Balinghasai
3	Anacardiaceae	*Swintonia foxworthyi*	Apitong babui/Rimaraw
4	Annonaceae	*Mezzettiopsis creaghii*	Tabingalang
5	Apocynaceae	*Alstonia macrophylla*	Batino/kurayan
6	Apocynaceae	*Magnolia grandiflora*	Magnolia
7	Apocynaceae	*Alstonia scholaris*	Dita
8	Araliaceae	*Arthrophyllum ahernianum*	Dokloi
9	Araliaceae	*Polyscias nodosa*	Malapapaya
10	Burseraceae	*Protium connarifolium*	Marangub
11	Burseraceae	*Canarium Asperum*	Sahing/Pagsahingin
12	Casuarinaceae	*Gymnostoma rumphianum*	Mt. Agoho
13	Chrysobalanaceae	*Maranthes corymbosa*	Liusin
14	Chrysobalanaceae	*Licania splendens*	Amayan
15	Clusiaceae	*Brakenridgea palustris*	Brakenridgea
16	Clusiaceae	*Garcinia benthami*	Bunog
17	Dilleniaceae	*Dillenia luzoniensis*	Malakatmon
18	Ebenaceae	*Diospyrus sp.*	Tandikan
19	Ebenaceae	*Dillenia monantha*	Katmon Bugtong
20	Elaeocarpaceae	*Eleaocarpus cumingii*	Katap/Pasi pasi/Hunggo
21	Euphorbiaceae	*Drypetes sp.*	Ranta Ranta
22	Fabaceae	*Acacia Auriculiformis*	Japanese Acacia

Table 8. continued...

No.	Family Name	Scientific Name	Common/Local Name
23	Fabaceae	*Achidendron clypearia*	Tiagkot
24	Guttiferae	*Cratoxylum formosum*	Salinggogon
25	Guttiferae	*Callophylum pentapetalum*	Pamitoyen
26	Guttiferae	*Calophyllum blancoi*	Palomaria/Bitanghol
27	Guttiferae	*Ochrocarpus ramiflorus*	Bitok
28	Guttiferae	*Garcinia sp.*	Malatambis
29	Guttiferae	*Macaranga tanarius*	Binunga
30	Lamiaceae	*Gmelina arborea*	Gmelina/Yemane
31	Lamiaceae	*Premna depauperata*	Alagau
32	Lamiaceae	*Neolitea vidalli*	Puso Puso
33	Lamiaceae	*Vitex pubescens*	Molawin mabuhok
34	Lauraceae	*Cinnamomum mercadoi*	Sinamoman/Kalingag
35	Leguminosae	*Albizia saponaria*	Salingkugi
36	Leguminosae	*Mimosa sp.*	Diklay
37	Leguminosae	*Diospyrus philosanthera*	Kanomay/bolong-eta
38	Loganiaceae	*Fagraea fragrans*	Dulo/dolo
39	Magnoliaceae	*Talauma villariana*	Patangis
40	Magnoliaceae	*Magnolia borneensis*	Maglandak/Palawan Patangis
41	Malvaceae	*Commersonia bartramia*	Kakaag
42	Meliaceae	*Swietenia macrophylla*	Mahogany
43	Moraceae	*Artocarpus blancoi*	Antipolo
44	Moraceae	*Ficus Bataanensis*	Bataan Fig
45	Myristaceae	*Ficus sp.*	Ficus ulmifolia
46	Myrsinaceae	*Ardisia squamulosa*	Tagpo
47	Myrtaceae	*Xanthostemon speciosus*	Palawan Mangkono
48	Myrtaceae	*Syzygium sp.*	Wild Tambis
49	Myrtaceae	*Syzygium aqueum*	Tambis
50	Phyllanthaceae	*Glochidion coronulatum*	Kakaua
51	Pittosporaceae	*Pittosporum pentandrum*	Mamalis
52	Rubiaceae	*Timonius arboreus*	Mabalod
53	Rubiaceae	*Canthium dicoccum*	Malakape
54	Rubiaceae	*Psychotria luzoniensis*	Tagpong Gubat /Suwakaw
55	Rubiaceae	*Gymnacranthera paniculata*	Anuping
56	Rubiaceae	*Intsia bijuga*	Ipil
57	Rubiaceae	*Rothmania merilii*	Bagaay
58	Rutaceae	*Achronesia pedunculata*	Marangkukutan

Table 8 continued...

No.	Family Name	Scientific Name	Common/Local Name
59	Sapindaceae	*Euphoria didyma*	Alupag
60	Sapotaceae	*Palaquim luzonensis*	Aripa/Nato
61	Sapotaceae	*Planchonella foxworthyii*	Alalud
62	Sapotaceae	*Pouteria micrantha*	Marapasi
63	Simaroubaceae	*Eurycoma longifolia*	Linatog/Tonkat Ali
64	Sterculiaceae	*Colona discolor*	Magbanotan
65	Verbenaceae	*Vitex parviflora*	Molave/Mulawin
66			Maglonawan
67			Talilisan
68			Balinto
69			Masok Masok
70			Magpango

C. UNDERSTOREY VEGETATION

The understorey vegetation are those plants that occupy the forest floor with DBH <5 cm to include wildlings and saplings. These were categorized and classified according categories: a) Lower Vascular Plants (Ferns and Fern Allies) and b) Higher Vascular Plants (Angiosperms): (a.) Monocots and (b.) Dicots (Including the tree saplings). **Table 9** shows the list of all encountered understorey vegetation during the flora assessment.

The assessed sites have a total of 83 understorey vegetation species which are distributed to 51 families. Five (5) families and 6 genera were categorized under the lower vascular plants. For the higher forms of vascular plants, a total of 7 families and 11 genera for monocots while 39 families and 66 genera for the dicot category were identified (**Table 10**). The families having 4 species each include Anacardiaceae, Orchidaceae, Sapindaceae, and Sterculiaceae (**Table 11**). This was followed by, Euphorbiaceae, Guttiferae/Clusiaceae, Leguminosae, Polypodiaceae, Rubiaceae, Urticaceae and Verbenaceae with 3 species each. Families with 2 species each include Apocynaceae, Burseraceae, Casuarinaceae, Ebenaceae, Lauraceae, Moraceae, Myrtaceae, and Zingiberaceae. On the other hand, those species with only one species each include Acanthaceae, Agavaceae, Araliaceae, Asclepiadacae, Aspleniaceae, Chrysobalanaceae, Combretaceae, Compositae/Asteraceae, Cyperaceae, Dilleniaceae, Elaeocarpaceae, Flagellariaceae, Gentianaceae, Goodeniaceae, Graminae, Lecythidaceae, Meliaceae, Myrsinaceae, Nepenthaceae, Ochnaceae, Pandanaceae, Phyllanthaceae, Pittosporaceae, Poaceae/Gramineae, Rhizophoraceae, Sapotaceae, Selaginellaceae, Simaroubaceae, Sinopteridaceae, Sonneratiaceae, and Ulmaceae.

Table 9. Understorey plants and tree saplings species found in the assessed areas at HPP Project Site of CBNC, Rio Tuba, Palawan.

No.	Family	Scientific Name	Common/Local Name
1	Acanthaceae	*Hemigraphis sp.*	Metal-leaf
2	Agavaceae	*Dracaena sp.*	Dracaena/Ti plant
3	Anacardiaceae	*Artocarpus blancoi*	Antipolo
4	Anacardiaceae	*Koordersiodendron pinnatum*	Amugis
5	Anacardiaceae	*Mangifera altissima*	Pahutan
6	Apocynaceae	*Alstonia macrophylla*	Batino
7	Apocynaceae	*Wrightia hanleyi*	Palawan Lanete
8	Araliaceae	*Arthrophyllum ahernianum*	Dokloi
9	Asclepiadaceae	*Hoya sp.*	Hoya (narrow leaf)
10	Aspleniaceae	*Asplenium nidus*	Pakpak lawin
11	Burseraceae	*Canarium asperum*	Pagsahingin
12	Burseraceae	*Protium connarifolium*	Marangub
13	Casuarinaceae	*Gymnostoma rhumpianum*	Mountain Agoho
14	Casuarinaceae	*Gymnostoma nobile*	Palawan Agoho
15	Chrysobalanoceae	*Licania splendens*	Amayan
16	Combretaceae	*Terminalia cattapa*	Talisay
17	Compositae/Asteraceae	*Vernonia cinerea*	Tagulinaw
18	Cyperaceae	*Cyperus sp.*	Cyperus
19	Dilleniaceae	*Dillenia luzonensis*	Malakatmon
20	Ebenaceae	*Diospyros discolor*	Kamagong
21	Ebenaceae	*Diospyros philosanthera*	Bulong-eta
22	Elaeocarpaceae	*Elaeocarpus palimlimensis*	Palimlim
23	Euphorbiaceae	*Antidesma obliquinervum*	Aniam/bignay gubat
24	Euphorbiaceae	*Claoxylon sphathulatum*	Balong sagai
25	Euphorbiaceae	*Euphorbia hirta*	Wild tawa-tawa
26	Flagellariaceae	*Flagellaria indica*	Uag/Baling uway
27	Gentianaceae	*Microrphium elmeranium*	
28	Goodeniaceae	*Scaevola frutescens*	Linu
29	Graminae	*Schizostachyum lima*	Sumbiling
30	Guttiferae	*Calophyllum blancoi*	Palomaria/Bitanghol
31	Guttiferae	*Cratoxylon formosum*	Salingogon
32	Guttiferae	*Garcinia laterifolia*	Candis
33	Lauraceae	*Alseodaphne malabonga*	Malabunga
34	Lauraceae	*Cinnamomum mercadoi*	Kalingag/Sinamoman
35	Lecythidaceae	*Barringtonia acutangula*	Himbabalod (Tag.)

Table 9 continued...

No.	Family	Scientific Name	Common/Local Name
36	Leguminosae/Fabaceae	*Acacia auriculiformis* Cunn.	Acacia auri
37	Leguminosae/Fabaceae	*Intsia bijuga*	Ipil
38	Leguminosae/Fabaceae	*Pterocarpus indicus*	Narra
39	Meliaceae	*Swietenia macrophylla*	Mahogany
40	Mimosaceae	*Parkia timoriana*	Kupang
41	Moraceae	*Ficus balete*	Balete (Tag.)
42	Moraceae	*Ficus ulmifolia*	Is-is
43	Myrsinaceae	*Ardisia squamolosa*	Tagpo
44	Myrtaceae	*Syzygium aqueum*	Tambis
45	Myrtaceae	*Xanthostemon speciosus*	Palawan Mangkono
46	Nepenthaceae	*Nepenthes philippinensis*	Pitcher plant
47	Ochnaceae	*Brackenridgea palustris*	Nickel accumulator
48	Orchidaceae	*Bulbophyllum sp.*	Bulbophyllum
49	Orchidaceae	*Habenaria sp. (1)*	Small orchid/Habenaria
50	Orchidaceae	*Habenaria sp. (2)*	Habenaria
51	Orchidaceae	*Nervillia sp.*	Nervillia
52	Pandanaceae	*Pandanus tectorius*	Pandan
53	Phyllanthaceae	*Phyllanthus balgooyii*	
54	Pittosporaceae	*Pittosporum pentandrum*	Mamalis
55	Poaceae/Graminae	*Schizostachyum diffusum*	Balikaw
56	Polypodiaceae	*Drynaria quercifolia*	Drynaria
57	Polypodiaceae	*Pyrossia adnacens*	
58	Polypodiaceae	*Pyrossia piloselloides*	
59	Rhizophoraceae	*Rhizophora apiculata*	Bakauan-lalaki
60	Rubiaceae	*Canthium dicoccum*	Malakape
61	Rubiaceae	*Jasminum aemulum*	Jasmin
62	Rubiaceae	*Timonius arboreus*	Mabalod
63	Sapindaceae	*Dimocarpus longan*	Alupag
64	Sapindaceae	*Guioa acuminate*	Pasi
65	Sapindaceae	*Nephelium lappaceum L. var lappaceum*	Usaw
66	Sapindaceae	*Pometia pinnata*	Malugay
67	Sapotaceae	*Planchonella duclitan*	Duklitan
68	Selaginellaceae	*Selaginella biformis*	Selaginella
69	Simaroubaceae	*Eurycoma longifolia*	Tongkat ali
70	Sinopteridaceae	*Adiantum philippense* Linn.	Adiantum

Table 9 continued...

No.	Family	Scientific Name	Common/Local Name
71	Sonneratiaceae	*Sonneratia alba*	Pagatpat
72	Sterculiaceae	*Commersonia bartramia*	Kakaag
73	Sterculiaceae	*Pterocymbium tinctorium*	Taluto
74	Sterculiaceae	*Pterospermum megalanthum*	Bayok lakihan
75	Sterculiaceae	*Sterculia ceramica*	Malakalumpang
76	Ulmaceae	*Trema orientalis*	Anabiong
77	Urticaceae	*Leucosyke ovatifolia*	Andarasa
78	Urticaceae	*Leucosyke palawanensis*	Palawan dai
79	Urticaceae	*Pipturus arborescens*	Dalunot
80	Verbenaceae	*Gmelina arborea*	Melina/Yemane
81	Verbenaceae	*Prema depauperata*	Alagau
82	Verbenaceae	*Vitex pubescens*	Molawin
83	Zingiberaceae	*Alphinia zerumbet*	Luya-luya

Table 10. Classification of understorey plants found in the assessed sites.

Categories	No. of Families	No. of Genera
A. Lower Vascular Plants	5	6
B. Higher Vascular Plants (Angiosperms)		
1. Monocots	7	11
2. Dicots	39	66
Total	**51**	**83**

Table 11. Summary of families and number of species.

No.	Family	No. of Species
1	Anacardiaceae	3
2	Orchidaceae	4
3	Sapindaceae	4
4	Sterculiaceae	4
5	Euphorbiaceae	3
6	Guttiferae/Clusiaceae	3
7	Leguminosae/Fabaceae	3
8	Polypodiaceae	3
9	Rubiaceae	3
10	Urticaceae	3
11	Verbenaceae	3
12	Apocynaceae	2
13	Burseraceae	2
14	Casuarinaceae	2

Table 11. continued...

No.	Family	No. of Species
15	Ebenaceae	2
16	Lauraceae	2
17	Moraceae	2
18	Myrtaceae	2
19	Zingiberaceae	1
20	Acanthaceae	1
21	Agavaceae	1
22	Araliaceae	1
23	Asclepiadaceae	1
24	Aspleniaceae	1
25	Chrysobalanoceae	1
26	Combretaceae	1
27	Compositae/Asteraceae	1
28	Cyperaceae	1
29	Dilleniaceae	1
30	Elaeocarpaceae	1
31	Flagellariaceae	1
32	Gentianaceae	1
33	Goodeniaceae	1
34	Graminae	1
35	Lecythidaceae	1
36	Meliaceae	1
37	Mimosaceae	1
38	Myrsinaceae	1
39	Nepenthaceae	1
40	Ochnaceae	1
41	Pandanaceae	1
42	Poaceae/Graminae	1
43	Phyllanthaceae	1
44	Pittosporaceae	1
45	Rhizophoraceae	1
46	Sapotaceae	1
47	Selaginellaceae	1
48	Simaroubaceae	1
49	Sinopteridaceae	1
50	Sonneratiaceae	1
51	Ulmaceae	1