

November 30, 2012

Eng. Justin Orozco, Director YFN

Harbor Light #45

Humacao, Puerto Rico 00791

Dear Engineer Orozco:

Below is the Final Report of the Flora and Fauna study of the property in the municipality of Yabucoa, as part of the permit and documentation requirements.

Introduction

The company YFN aims to develop 20 wind turbines with a capacity of 2MV each and a photovoltaic park of 20 MV within approximately 830 acres in various plots in the municipality of Yabucoa.

Methodology

Visits to the property under study were conducted from June to November 2012. Flora species were identified in the field and/or an herbarium for those species of greater difficulty. For the latter case, plant samples were collected to be identified later.

Fauna was identified on-site, either by visual contact, auditory means, or by indirect signs such as feathers, feces, molts (in the case of reptiles), nests, among others. In the case of birds, the early morning hours (between 6:30 and 10:30 AM) and dusk (between 4:30 and 6:00 PM) were used since this time periods represent their active hours, and is less difficult. Binoculars with a power of 10 x 42 and a field notebook were used for the collection of flora and fauna data. The data was tabulated and presented in the report below.

Eng. Justin Orozco

November 30, 2012

Page 2

Results

The identified Flora species were divided into: trees, palms, shrubs, vines, ferns, bromeliads, and grasses. Table 1 presents the species identified on the property.

The identified Fauna groups were divided into: mammals, birds, reptiles, fish, and amphibians. The most abundant group turned out to be birds. Table 2 presents the species found on the property.

In this work, no threatened or endangered species were detected within or near the property under study.

Any doubts regarding this can be addressed to me. Sincerely,



Carlos R. Ruiz Lebron

Biologist

Attachments

Table 1. Final List of Plants on the Yabucoa Farm, Puerto Rico

Family	Scientific Name	Common Name	Group
Amaranthaceae	<i>Achyranthes indica</i>	Rabo de ratón	Ar
Acanthaceae	<i>Thumberia alata</i>	Susana	B
Amaranthaceae	<i>Gomphrena serrata</i>	Arrasa con todo	Ar
Amaranthaceae	<i>Amaranthus dubius</i>	Blero	Ar
Anacardiaceae	<i>Anacardium occidentale</i>	Pajuil	A
Anacardiaceae	<i>Mangifera indica</i>	Mango	A
Anacardiaceae	<i>Spondias mombin</i>	Jobillo	A
Apocynaceae	<i>Rauvolfia nitida</i>	Palo amargo	A
Araceae	<i>Philodendron consanguineum</i>	Bejuco de calabaza	B
Araceae	<i>Colocasia esculenta</i>	Malanguilla	Ar
Araceae	<i>Diffenbachia seguine</i>	Rábano cimarrón	Ar
Araceae	<i>Syngonium podophyllum</i>	Malanga trepadora	B
Araliaceae	<i>Schefflera morototoni</i>	Yagrumo macho	A
Asclepiadaceae	<i>Asclepias nivea</i>	Platanillo	Ar
Asteraceae	<i>Mikania</i> sp.	Guaco	B
Bignoniaceae	<i>Spathodea campanulata</i>	Tulipán africano	A
Bignoniaceae	<i>Tabebuia heterophylla</i>	Roble nativo	A
Bignoniaceae	<i>Macfadyena ungis-cati</i>	Uña de gato	B
Bombacaceae	<i>Ceiba pentandra</i>	Ceiba	A
Boraginaceae	<i>Cordia collococa</i>	Capa colorado	A
Boraginaceae	<i>Tournefortia hirsutissima</i>	Nigua	B
Boraginaceae	<i>Cordia polycephala</i>	Basora prieta	Ar
Boraginaceae	<i>Bouyeria succulenta</i>	Palo de vaca	A
Bromeliaceae	<i>Bromelia pinguin</i>	Maya	Br
Bromeliaceae	<i>Tylandsia</i> sp.	Tilansia	Br
Burceraceae	<i>Burcera cimaruba</i>	Almácigo	A
Caesalpinaceae	<i>Emelista tora</i>	Dormidera	Ar
Carduaceae	<i>Eupatorium odoratum</i>	Cariaquillo Santa Maria	Ar
Combretaceae	<i>Bucida buceras</i>	Úcar	A
Combretaceae	<i>Terminalia catappa</i>	Almendro	A
Compositae	<i>Wedelia trilobata</i>	Manzanilla	B
Compositae	<i>Bidens pilosa</i>	Margarita silvestre	Ar
Connaraceae	<i>Rourea surinamensis</i>	Juan caliente	B

Convolvulaceae	<i>Merremia quinquefolia</i>	Batatilla blanca	B
Convolvulaceae	<i>Cuccuta americana</i>	Bejuco de mona	B
Convolvulaceae	<i>Ipomoea tiliacea</i>	Bejuco de puerco	B
Convolvulaceae	<i>Jacquemontia pentathos</i>	Aguinaldo azul	B
Cucurbitaceae	<i>Melothria pendula</i>	Pepinillo cimarrón	B
Cucurbitaceae	<i>Cucurbita charantia</i>	Cundeamor	B
Cyperaceae	<i>Cyperus odoratus</i>	NIA	Gr
Cyperaceae	<i>Rhynchospora neNosa</i>	Yerba de estrella	Gr
Cyperaceae	<i>Cyperus iria</i>	NIA	Gr
Cyperaceae	<i>Cyperus imbricatus</i>	NIA	Gr
Cyperaceae	<i>Cyperus ligularis</i>	Junco de agua	Gr
Cyperaceae	<i>Cyperus rotundus</i>	Yerba Coqui	Gr
Cyperaceae	<i>Cyperus polystachyos</i>	NIA	Gr
Cyperaceae	<i>Fimbrtilis dicotoma</i>	Junquillo	Gr
Elaeocarpaceae	<i>Muntigia calabura</i>	Capulín	A
Erythroxylaceae	<i>Erythroxylum aerolatum</i>	Falsa Coca	Ar
Esterculiaceae	<i>Melochia pyramidata</i>	Bretónica piramidal	Ar
Euphorbiaceae	<i>Jathropha gossypiifolia</i>	Tua Tua	Ar
Euphorbiaceae	<i>Euphorbia heterophylla</i>	Leche Vana	Ar
Euphorbiaceae	<i>Ricinus communis</i>	Higuereta	Ar
Fabaceae	<i>Abrus precatorius</i>	Peronía	B
Fabaceae	<i>Desmodium tortuosum</i>	Cadillo pegajoso	Ar
Fabaceae	<i>Crotalaria striata</i>	Cascabelillo	Ar
Fabaceae	<i>Caesalpinia bonduc</i>	Mato de playa	B
Flacourtiaceae	<i>Casearia silvestris</i>	Cafeillo	A
Flacourtiaceae	<i>Casearia guianensis</i>	Palo blanco	A
Flacourtiaceae	<i>Cassearia decandra</i>	Tostado	A
Gingeraceae	<i>Chielocostus speciosus</i>	Insulina	Ar
Guttiferae	<i>Calophyllum calaba</i>	Marfa	A
Hippocrateaceae	<i>Hippocratea volubilis</i>	Bejuco prieto	B
Lauraceae	<i>Licaria paulifolia</i>	Laurel	A
Lauraceae	<i>Cassytha filiformis</i>	Fideillo	B
Leguminosae	<i>Albizia procera</i>	Albizia	A
Leguminosae	<i>Albizia lebbek</i>	Acasia amarilla	A
Leguminosae	<i>Andira inermis</i>	Moca	A
Leguminosae	<i>Hymenaea courbaril</i>	Algarrobo	A
Leguminosae	<i>Pithecellobium unguis-cati</i>	Rolon	A

Leguminosae	<i>Mimosa pudica</i>	Morivivi	Ar
Leguminosae	<i>Macroptilium lathyroides</i>	Habichuela parada	Ar
Leguminosae	<i>Pueraria phaseoloides</i>	Kudzu tropical	B
Leguminosae	<i>Leucaena leucocephala</i>	Zarcilla	A
Leguminosae	<i>Sena occidentalis</i>	Hedionda	Ar
Leguminosae	<i>Samanea saman</i>	Saman	A
Leguminosae	<i>Acasia farneciana</i>	Aroma	Ar
Leguminosae	<i>Peltophorum pterocarpum</i>	Flamboyan amarillo	A
Leguminosae	<i>Alysicarpus vaginalis</i>	Yerba de contrabando	Ar
Leguminosae	<i>Desmanthus virgatus</i>	Desmanto	Ar
Leguminosae	<i>Cesbania cericea</i>	Cresta de gallo	Ar
Leguminosae	<i>Rhynchosia reticulata</i>	Habilla	B
Leguminosae	<i>Mimosa castaphylum</i>	Zarza	B
Leguminosae	<i>Mimosa casta</i>	Zarza	B
Leguminosae	<i>Delonis regia</i>	Flamboyan	A
Leguminosae	<i>Gliricidia sepium</i>	Mata ratón	A
Leguminosae	<i>Tamarindus indica</i>	Tamarindo	A
Leguminosae	<i>Senna occidentalis</i>	Hedionda	Ar
Leguminosae	<i>Senna sp.</i>	Hedionda peluda	Ar
Leguminosae	<i>Indigofera suffruticosa</i>	Afil	Ar
Melastomataceae	<i>Miconia laevigata</i>	Camasey de paloma	Ar
Melastomataceae	<i>Miconia impetolaris</i>	Camasey de costilla	Ar
Melastomataceae	<i>Miconia sp.</i>	Camasey	Ar
Melastomataceae	<i>Clidemia hirta</i>	Camasey peludo	Ar
Melastomataceae	<i>Rhexia cubensis</i>	Mantilla española	B
Meliaceae	<i>Guarea Guidonia</i>	Guaraguao	A
Malpigiaceae	<i>Heteropteris purpureum</i>	Bejuco de paralejo	B
Malvaceae	<i>Urena lobata</i>	Cadillo	Ar
Malvaceae	<i>Sida sp.</i>	Escoba	Ar
Malvaceae	<i>Urena trilobata</i>	Cadillo	Ar
Malvaceae	<i>Thespesia populnea</i>	Emajaguilla	A
Malvaceae	<i>Malachra alceifolia</i>	Malva de caballo	Ar
Meliaceae	<i>Trichilia hirta</i>	Gaita	A
Mirtaceae	<i>Eugenia monticola</i>	Hoja menuda	A
Moraceae	<i>Ficus citrifolia</i>	Jaguey blanco	A
Moraceae	<i>Cecropia schreberiana</i>	Yagrumo hembra	A
Myrtaceae	<i>Psidium guajava</i>	Guayaba	Ar

Nyctaginaceae	<i>Guapira fragrans</i>	Corcho	A
Orchidaceae	<i>Oecoelades maculata</i>	Orquidea africana	Ar
Palmae	<i>Coccus nucifera</i>	Palma de coco	A
Palmae	<i>Roystonea borinquena</i>	Palma real	p
Papilionoideae	<i>Rhynchosia sp.</i>	Frijolillo	B
Passifloraceae	<i>Passiflora suberosa</i>	Parcha yedra	B
Passifloraceae	<i>Passiflora edulis</i>	Parcha	B
Phytolacaceae	<i>Trichostigma octandrum</i>	Bejuco de paloma	B
Piperaceae	<i>Piper aduncum</i>	Higuillo	Ar
Piperaceae	<i>Piper amalago</i>	Higuillo oloroso	Ar
Piperaceae	<i>Lepianthes peltata</i>	Baquifia	Ar
Poaceae	<i>Cynodon dactylon</i>	Pepe Ortiz	Gr
Poaceae	<i>Axonopus compressus</i>	Gramma colorada	Gr
Poaceae	<i>Paspalum conjugatum</i>	Horquetilla	Gr
Poaceae	<i>Sporobolus indicus</i>	Matojo de burro	Gr
Poaceae	<i>Stenotaphrum secundatum</i>	Yerba San Agustín	Gr
Poaceae	<i>Urochloa maxima</i>	Yerba de Guinea	Gr
Poaceae	<i>Paspalum millegrana</i>	Cortadera	Gr
Poaceae	<i>Chloris inflata</i>	Paragüita	Gr
Poaceae	<i>Paspalum fimbriatum</i>	Pata de conejo	Gr
Poaceae	<i>Cynodon sp.</i>	NIA	Gr
Poaceae	<i>Cynodon nlenfuensis</i>	Yerba de estrella	Gr
Poaceae	<i>Paspalum virgatum</i>	Matojo blanco	Gr
Poaceae	<i>Cynodon dactylon</i>	Gramma nativa	Gr
Poaceae	<i>Urochloa adspersa</i>	Cohitrillo	Gr
Poaceae	<i>Zoicia manila</i>	Gramma	Gr
Poaceae	<i>Pennisetum purpureum</i>	Yerba de elefante	Gr
Poaceae	<i>Brachiaria mutica</i>	Malojillo	Gr
Poaceae	<i>Hymenachne amplexicaulis</i>	Trompetilla	Gr
Poaceae	<i>Bambusa vulgaris</i>	Bambu	Gr
Poligalaceae	<i>Securidaca virgata</i>	Bejuco de sople	B
Polypodiaceae	<i>Nephrolepis exaltata</i>	Helecho de espada	He
Polypodiaceae	<i>Acrostichum aerolatum</i>	Helecho de pantano	He
Polypodiaceae	<i>Acrostichum denaeifolium</i>	Helecho de pantano	He
Polypodiaceae	<i>Telypteris sp.</i>	Helecho	He
Polypodiaceae	<i>Tectaria sp.</i>	Helecho	He
Polypodiaceae	<i>Polypodium sp.</i>	Helecho	He

Portulacaceae	<i>Portulaca sp.</i>	Verdolaga	Ar
Rubiaceae	<i>Spermacoce verticillata</i>	Botón blanco	Ar
Rubiaceae	<i>. Randia aculeata</i>	Tintillo	Ar
Rubiaceae	<i>Psychotria sp.</i>	Cachimbo	Ar
Rubiaceae	<i>Marinda citrifolia</i>	Noni	A
Rubiaceae	<i>Gonzalagunia hirsuta</i>	Rabo de ratón	Ar
Rubiaceae	<i>Chiococca alba</i>	Bejuco de berac	B
Rutaceae	<i>Zanthoxylum martinicense</i>	Cenizo	A
Sapindaceae	<i>Paullinia pinnata</i>	Bejuco de Costilla	B
Sapindaceae	<i>Cupania Americana</i>	Guara	A
Sapindaceae	<i>Serjania polyphylla</i>	Bejuco de Canasta	B
Sapotaceae	<i>Sideroxylon foetidissimum</i>	Tortugo amarillo	A
Solanaceae	<i>Solanum torvum</i>	Berenjena Cimarrona	Ar
Solanaceae	<i>Solanum macrophyllum</i>	Galan de Monte	Ar
Solanaceae	<i>Solanum americanum</i>	Yerba Mora	Ar
Solanaceae	<i>Cestrum diurnum</i>	Dama de Dia	Ar
Solanaceae	<i>Physalis pubescens</i>	Sacabuche	Ar
Solanaceae	<i>Solanum capsicoides</i>	Mata cucaracha	Ar
Thyphaceae	<i>Typha domingensis</i>	Enea	Ar
Tiliaceae	<i>Triunfetta semitriloba</i>	Cadillo de perro	Ar
Tilliaceae	<i>Corchorus cestuans</i>	Escoba	Ar
Tilliaceae	<i>Corchorus americanus</i>	Escoba blanca	Ar
Verbenaceae	<i>Citharexylum fruticosum</i>	Pendula	A
Verbenaceae	<i>Stachytarpheta jamaicensis</i>	Verbena	Ar
Verbenaceae	<i>Lantana involucrata</i>	Cariaquilo Santa Maria	Ar
Verbenaceae	<i>Lantana camara</i>	Cariaquillo	Ar
Verbenaceae	<i>Petitia domingensis</i>	Capa blanco	A
Vitaceae	<i>Cissus trifoliata</i>	Bejuco de Caro	B

A = Tree Ar= Shrub B = Vine Br= Bromeliad Gr= Grasses
He= Fern P = Palm NIA = No common name

Table 2. Final list of Fauna found on the farm in Yabucoa, Puerto Rico.

Family	Scientific Name	Common Name	Group
Birds			
Accipitridae	<i>Falco sparverius</i>	Falconcito	N
Accipitridae	<i>Falco columbarius</i>	Merlin	M
Accipitridae	<i>Buteo iamaicensis</i>	Guaraguao	N
Anodidae	<i>Petrochelidon fulva</i>	Golondrina de cuevas	N
Ardeidae	<i>Ardea alba</i>	Garza real	N
Ardeidae	<i>Bubulcus ibis</i>	Garza ganadera	N
Ardeidae	<i>Ardea herodias</i>	Garzon cenizo	M
Ardeidae	<i>Nvctanassa violacea</i>	Yaboa común	N
Ardeidae	<i>Butorides virescens</i>	Martinete	N
Charadriidae	<i>Charadrius vociferous</i>	Playero sabanero	N
Charadriidae	<i>Actilis macularius</i>	Playero colector	N
Charadriidae	<i>Himantopus mexicanus</i>	Viuda	N
Columbidae	<i>Zenaidura macroura</i>	Tortola cardosantera	N
Columbidae	<i>Zenaidura macroura</i>	Tortola aliblanca	N
Columbidae	<i>Columbina oasserina</i>	Rolita	N
Cuculidae	<i>Coccyzus minor</i>	Pájaro bobo menor	N
Cuculidae	<i>Crotophaga sulcirostris</i>	Jidfo	N
Emberizidae	<i>Lonchura cucullata</i>	Diablito	I
Emberizidae	<i>Tiaris bicolor</i>	Gorrión cabecinegro	N
Emberizidae	<i>Vidua macroura</i>	Viuda colicinta	I
Emberizidae	<i>Parkesia motacilla</i>	Pizpita de río	M
Emberizidae	<i>Soindalis oortoricensis</i>	Reina mora	E
Emberizidae	<i>Sicalis flaveola</i>	Pinzon azafran	I
Emberizidae	<i>Estrilda melodia</i>	Veterano	I
Emberizidae	<i>Coereba flaveola</i>	Reinita común	N
Emberizidae	<i>Lonchura nunctulata</i>	Gorrión canela	I
Emberizidae	<i>Dendroica dominica</i>	Reinita de garganta amarilla	M
Emberizidae	<i>Passer domesticus</i>	Gorrión inales	Ex
Icteridae	<i>Quiscalus niaer</i>	Mozambique	N
Icteridae	<i>Molothrus bonariensis</i>	Tordo	N
Icteridae	<i>Icterus dominicensis</i>	Calandria	E
Mimidae	<i>Mimus molitor</i>	Ruiseñor	N
Mimidae	<i>Maraarops fuscatus</i>	Zorzal pardo	N
Muscicapidae	<i>Turdus olumbeus</i>	Zorzal de patas rojas	N
Picidae	<i>Melanerpes formicivorus</i>	Pájaro carpintero de PR	E
Striidae	<i>Otus nudioes</i>	Mucarita de PR	E
Trochilidae	<i>Anthracoceros dominicus</i>	Zumbador dorado	N
Trochilidae	<i>Orthorhynchus cristatus</i>	Zumbador crestado	N
Tyrannidae	<i>Tyrannus dominicensis</i>	Pitirre	N

Tyrannidae	<i>Elaenia martinica</i>	Juf blanco	NIM
Vireonidae	<i>Vireo altiloauus</i>	Julian chiví	M
Anfibians			
Brachycephalidae	<i>Eleutherodactylus antillensis</i>	Churoi	N
Brachycephalidae	<i>Eleutherodactylus coqui</i>	Coqui comun	E
Brachycephalidae	<i>Eleutherodactylus arillus</i>	Coqui grillo	N
Bufo	<i>Bufo marinus</i>	Sapo común	I
Leotodactylidae	<i>Leotodactylus albilabris</i>	Sapito de labia blanco	N
Ranidae	<i>Rana catesbeiana</i>	Rana toro	N
Reptiles			
Colubridae	<i>Alsoohis oortoricensis</i>	Culebra corredora	N
Emvididae	<i>Trachemys steineaeri</i>	Jicotea	N
Gekkonidae	<i>Sphaerodactylus so.</i>	Gueko	N
Iguanidae	<i>Anolis stratulus</i>	Lagartijo manchado	N
Iguanidae	<i>Anolis cristatellus</i>	Lagartijo común	N
Iguanidae	<i>Anolis pulchellus</i>	Lagartijo de jardín	N
Iguanidae	<i>Anolis evermanni</i>	Lagartijo verde	N
Iguanidae	<i>Iguana iguana</i>	Gallina de Palo	Ex
Teiidae	<i>Ameiva exsul</i>	Siauíana	N
Mammals			
Procyonidae	<i>Procyon aurouinctatus</i>	Manatí	Ex
Molossidae	<i>Molossus molossus</i>	Murciélago insectívoro	N
Muridae	<i>Rattus so.</i>	Rata	Ex
Muridae	<i>Mus musculus</i>	Arriero	Ex
Fish			
Cichlidae	<i>Tilapia so.</i>	Chooa	I
Poeciliidae	<i>Poecilia sn.</i>	Guoi	N

N = Native M = Migratory E = Endemic Ex = Exotic I = Introduced