November 2014

Flora & Fauna Survey

for the

Culebra Auxiliary Cargo Ferry Terminal at San Ildefonso

Culebra, Puerto Rico

Prepared For :

AUTORIDAD de los PUERTOS de PUERTO RICO

Prepared By:

ATKINS

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Introduction

Pursuant to the emergency situation that occurred at the Culebra Passenger Ferry Terminal Platform after the passing of Hurricane Earl on August 30, 2010, Atkins Caribe, LLP was asked to evaluate the structural condition of the Culebra passenger terminal platform and the Culebra cargo terminal ramp. A site visit was conducted in August 2010 to assess the conditions of these structures and a report, dated September 20, 2010, was submitted to Maritime Transport Authority of Puerto Rico (MTAPR).

The evaluation of the structural condition of the cargo terminal revealed deterioration of the deck slab and concrete beams. While it may be possible to patch and repair the deteriorated structure, any repairs attempted for this facility would be of short-term duration. The inspection revealed that the corrosion observed in the deck slab has probably spread to the entire concrete surface. The deterioration appears to be a result of previous storm events/hurricanes and wave action. If repair/reconstruction of the cargo terminal is not conducted promptly, the potential exists for structural failure. As the only heavy commercial cargo transportation port in Culebra, the cargo ferry provides a crucial service to the residents of the island. The Puerto Rico Ports Authority (PRPA) has requested Federal Emergency Management Agency (FEMA) funds, under the Hazard Mitigation Grant Program (HMGP), for reconstruction/repair of the cargo platform of the Municipality of Culebra.

One of the main missions of the Federal Emergency Management Agency (FEMA) is to support the citizens of the United States of America and first responders to ensure that as a nation, we work together to build, sustain and improve our capability to prepare for, protect against, respond to, recover from and mitigate all hazards from natural disasters. The Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under *Section 404* of the *Robert T. Stafford Disaster Relief and Emergency Assistance Act*. With this project, FEMA and PRPA propose to accomplish this mission by rehabilitating the existing Cargo Pier located at Sardinas Bay and the constructing a new auxiliary cargo Pier at San Ildefonso Sector.

Project Description

The Project consists on the installation of a pre-engineered aluminum floating pontoon dock, measuring 40 feet in length by 50 feet in width, with a gross area of 2,000 square feet (18.58 square meters). This pre-fabricated floating aluminum metal docking platform will be secured and anchored to the site using a minimum of 4 to a maximum of 6 steel piles.

The floating pontoon dock will be connected to the terminal by using a pre-fabricated aluminum bridge for vehicular circulation. This bridge will measure 45 feet long by 25 feet wide, with a gross area of 1,125 square feet (104.52 square meters).

The site improvement area is approximately 27,263.56 square feet (2532.87 square meters). The existing access road and existing parking lot at the front of this facility are to be reconditioned for heavy traffic (trucks, semi-trailers, and heavy machinery), as the auxiliary cargo facilities are to be repaved with a new 2" asphalt wearing course and the road. In addition to this re-pavement, the access road is to be widened 10 feet at each side. The total length of the roadway modifications are 365 feet from the beginning of the parking facilities until reaching the "Y" intersection.

General Description of Study Area

The study area is located on a slightly sloping hill that ends at the northern shoreline of Ensenada Honda. The highest point within the proposed project area is located on the "Y" intersection, reaching approximately 28 feet, while the lowest point is at sea level. According to the Holdridge Life Zone Classification System, the San Ildefonso area, as well as the entire island of Culebra, is located within the *subtropical dry forest*, with average high temperatures of 87.7° F and average low temperatures of 75.9° F. Average annual rainfall is 62.2 mm[1], with the months of May through November being the wettest of the year.

Vegetation in the area is limited to small grasses typically found near impacted and asphalted areas. Tree species are mostly ornamentals and introduced species, with a limited number of native species. No wetlands are present within the project area.

[1] http://www.meoweather.com/history/United%20States/na/18.305/-65.301/Culebra.html

*Drawing not to Scale

Source: Atkins

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Culebra Auxiliary Cargo Ferry Terminal At San Ildefonso Flora & Fauna Studies

Location Map

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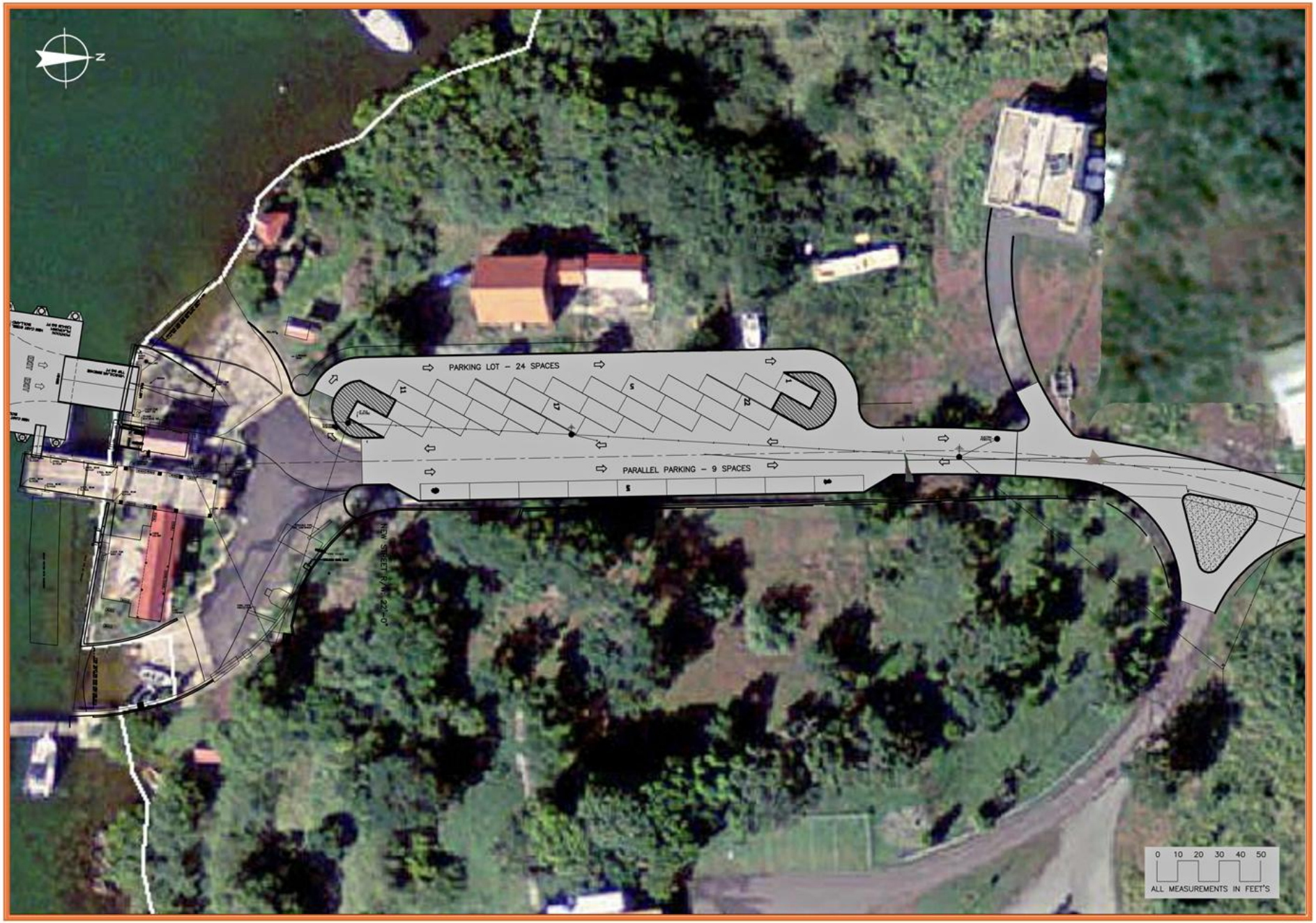
Figure 1



*Drawing not to Scale

Source: Atkins

AUTORIDAD de los PUERTOS de PUERTO RICO

Culebra Auxiliary
Cargo Ferry Terminal
At San Ildefonso
Flora & Fauna Studies

Site Plan (Conceptual)

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Figure
2

Location

The proposed Culebra Auxiliary Cargo Ferry Terminal Facilities are located in San Ildefonso in Flamingo Ward, on a peninsula in the northern shoreline of Ensenada Honda in the island municipality of Culebra, Puerto Rico. It is bordered to the north by Road 250, to the east by Caño Quebrado, on the west by Ensenada del Cementerio, and on the south by Ensenada Honda. This area was the historic location of the first settlement in the island, named San Ildefonso de la Culebra. The proposed project coordinates are Latitude *18°18'22.63"N* and Longitude *65°17'00.44"W*. (***Figure 1, Location Map*** and ***Figure 2, Site Plan***).

Topography

The study area is located on a slightly sloping hill that ends at the northern shoreline of Ensenada Honda. The highest point within the proposed project area is located on the "Y" intersection, reaching approximately 28 feet, while the lowest point is at sea level. (***Figure 3, USGS Topographic Map***)

Soils

Based on the U.S. Department of Agriculture-Natural Resources Conservation Service (USDA/NRCS) Soil Survey of the Humacao Area (Puerto Rico, Eastern Part (PR689)), the study area is located in an area classified as **Rock Land**, with a very small percentage classified as **Tidal Swamp.** For a description of each soil unit, see ***Table 1a (Soil Unit Descriptions)*** and ***1b (Soil Unit Descriptions-Percentages)***, in addition to ***Figure 4, USDA/NRCS Soil Survey Map***.

Table 1a: Soil Unit Descriptions

Map Unit Sym	Map Unit Name	Description		
		Setting	Typical Profile	Properties & Qualities
Rs	Rock Land, 100%	Landform: *ridges* Landform position: *backslope* Landform position: *mountainflank* Downslide shape: *concave, convex* Across-slope Shape: *linear*	H1 - 0 to 60 inches: *unweathered bedrock*	Slope: *60-70%* Depth to restrictive feature: *0-lithic bedrock* Capacity of the limiting layer to transmit water: *0.06-5.95 in/hr*
Ts	Tidal Swamp	Landform: *Tidal marshes*	H1 - 0 to 60 inches: *variable*	Slope: *0-2%* Depth to restrictive feature: *<80"* Natural drainage class: *very poorly drained* Depth to water table: *~0"* Frequency of flooding: *frequent* Frequency of ponding: *frequent* Salinity, max in profile: *16.0-32.0mmhos/cm*

Data acquired from the USDA/NRCS Web Soil Survey

Table 1b: Soil Unit Percentages

Humacao Area, Puerto Rico Eastern Part (PR689)			
Map Unit Symbol	**Map Unit Name**	**Acres in Area of Interest (AOI)**	**Percent of AOI**
Rs	Rock land	*1.3*	*84.2%*
Ts	Tidal swamp	*0.0*	*0.2%*
Subtotals for Soil Survey Area		*1.3*	*84.4%*
Totals for Area of Interest		*1.6*	*100.0%*

Data acquired from the USDA/NRCS Web Soil Survey

Terrestrial Flora & Fauna Methodology

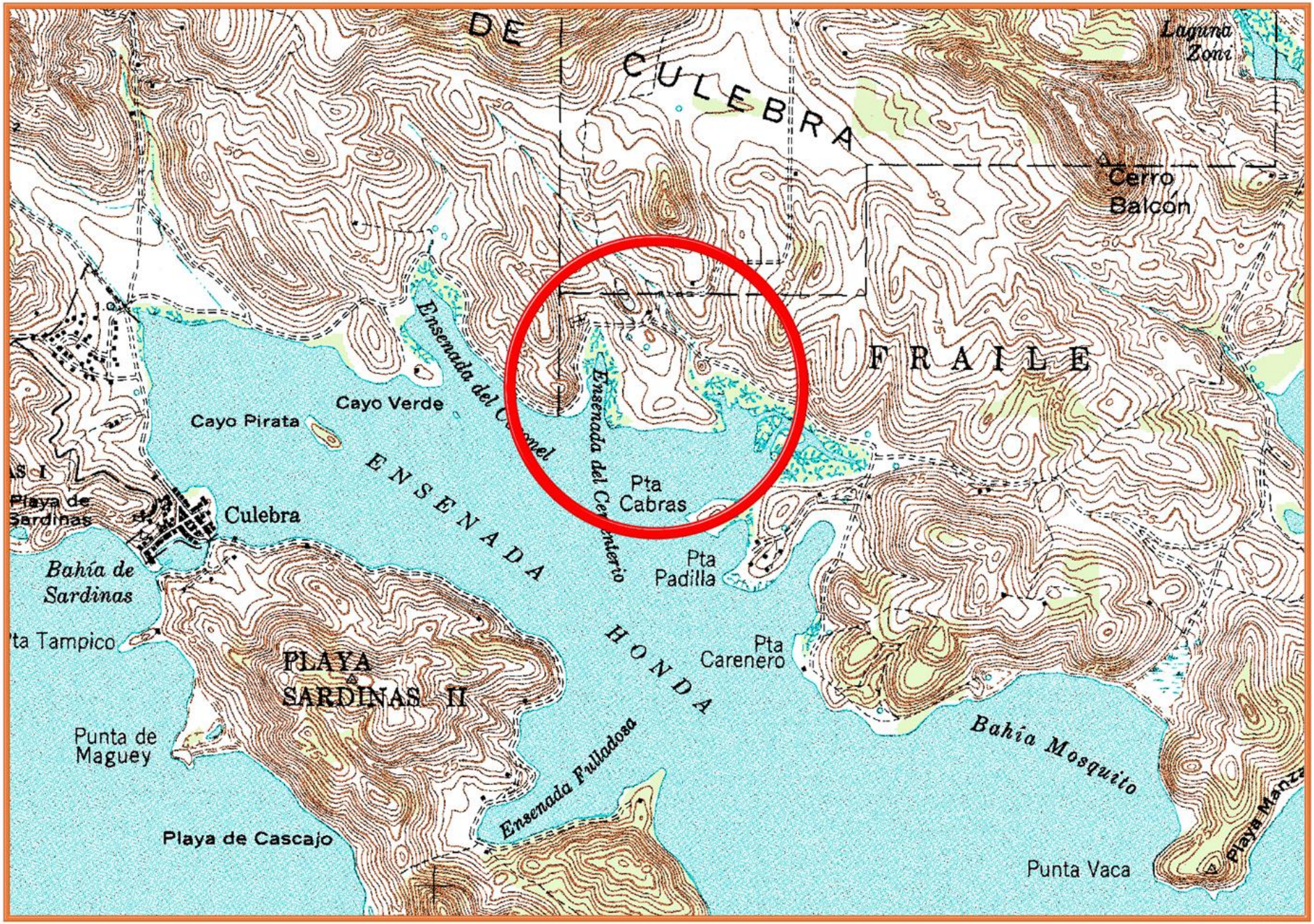
The objective of this study is to document the flora and fauna that is currently found at the project site as habitat. The successful completion of this task resulted in a comprehensive list of the flora and fauna and a characterization of the present habitat in accordance with Act 241 of August 15, 1999.

The methodology described is based on procedures recommended by the Department of Natural and Environmental Resources (DNER) and the United States Fish and Wildlife Service (USFWS), which included field evaluations.

An assessment of the project site was conducted to verify its natural features, general site characteristics, confirm project limits and to carry out a photographic documentation. In addition, USGS topographic maps, aerial photography and project drawings were used to determine a proper methodology to efficiently conduct the tree survey.

Preliminary Assessment

A preliminary site assessment was conducted to provide a general characterization of the area, including its location, its physical and natural features and the project boundaries. In addition, aerial photos, USGS topographic maps and USDA soil maps were used to establish the methodology for the field study.



*Drawing not to Scale

Source: USGS, Atkins

AUTORIDAD de los PUERTOS de PUERTO RICO

CULEBRA AUXILIARY CARGO FERRY TERMINAL AT SAN ILDEFONSO FLORA & FAUNA STUDIES

USGS TOPOGRAPHIC MAP

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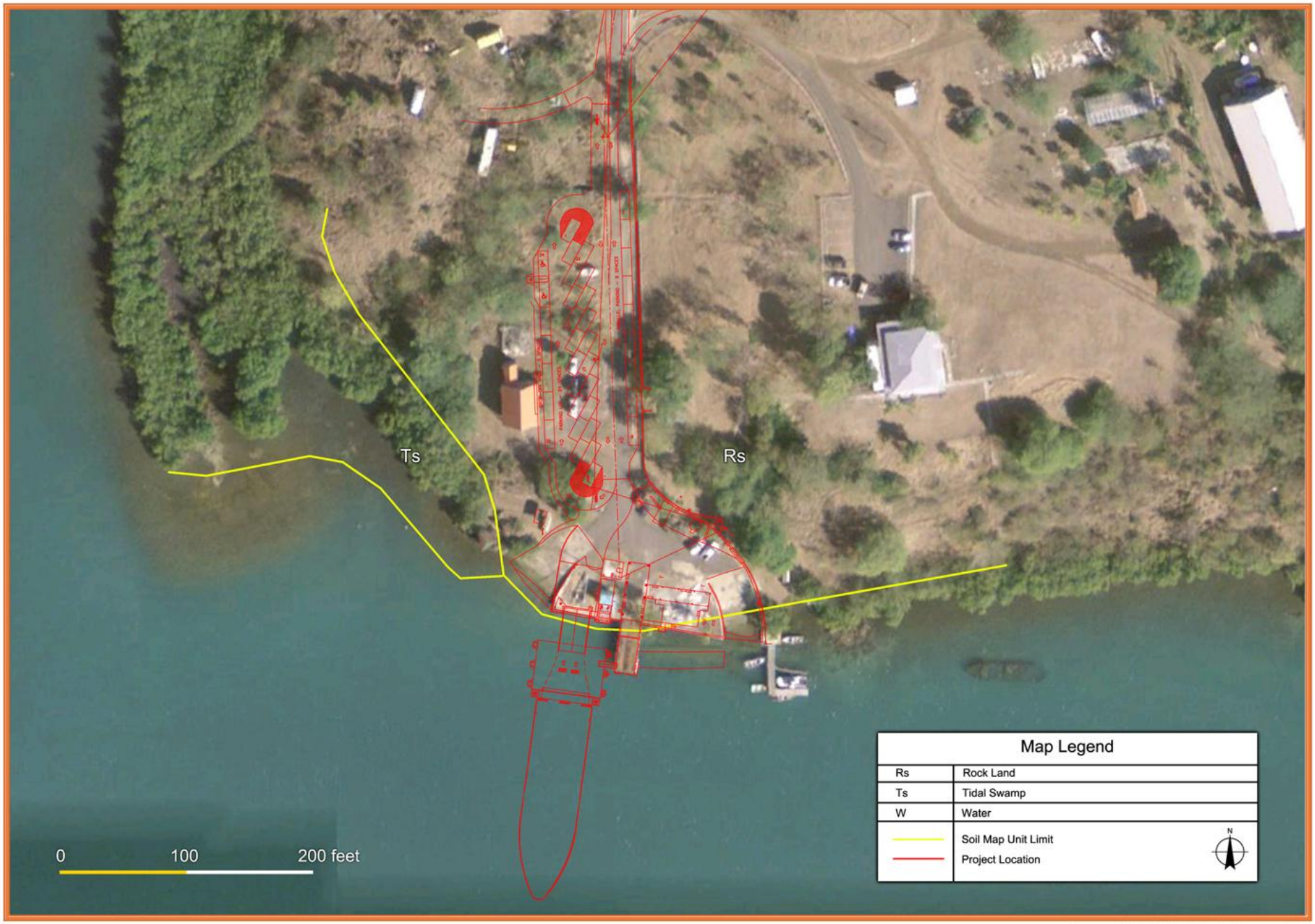
FIGURE 3



*Drawing not to Scale

Source: USDA/NRCS Web Soil Survey, Atkins

AUTORIDAD de los PUERTOS de PUERTO RICO

CULEBRA AUXILIARY CARGO FERRY TERMINAL AT SAN ILDEFONSO FLORA & FAUNA STUDIES

USDA/NRCS SOIL SURVEY

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FIGURE 4

Environmental Sensitivity Index Map

Environmental Sensitivity Index (ESI) maps (***Figure 5, NOAA Environmental Sensitivity Index Map***) provide a summary of coastal resources that are at risk during emergency situations caused by human negligence. Examples of at-risk resources include biological resources (such as birds and shellfish beds), sensitive shorelines (such as marshes and tidal flats), and human-use resources (such as public beaches and parks), as well as provide data on recorded observations of flora and fauna species that are classified as *Critical*, *Threatened* or *Endangered* around coastal areas, river basins, streams and lakes of Puerto Rico. These studies were conducted by the National Oceanic and Atmospheric Administration (NOAA) in collaboration with organizations and state and federal government agencies.

Additional Consultation

In order to specifically search for critical elements (endemic, rare, threatened and endangered species) at the site, the following sources were investigated:

a. *Consultation with the DNER and the U.S. Fish & Wildlife Service (USFWS) for the municipalities of San Juan.*
b. *Consultation of the Puerto Rico Critical Wildlife Areas, a publication of the DNER.*
c. *Consultation of the Puerto Rico Breeding Bird Atlas[2] for the area.*

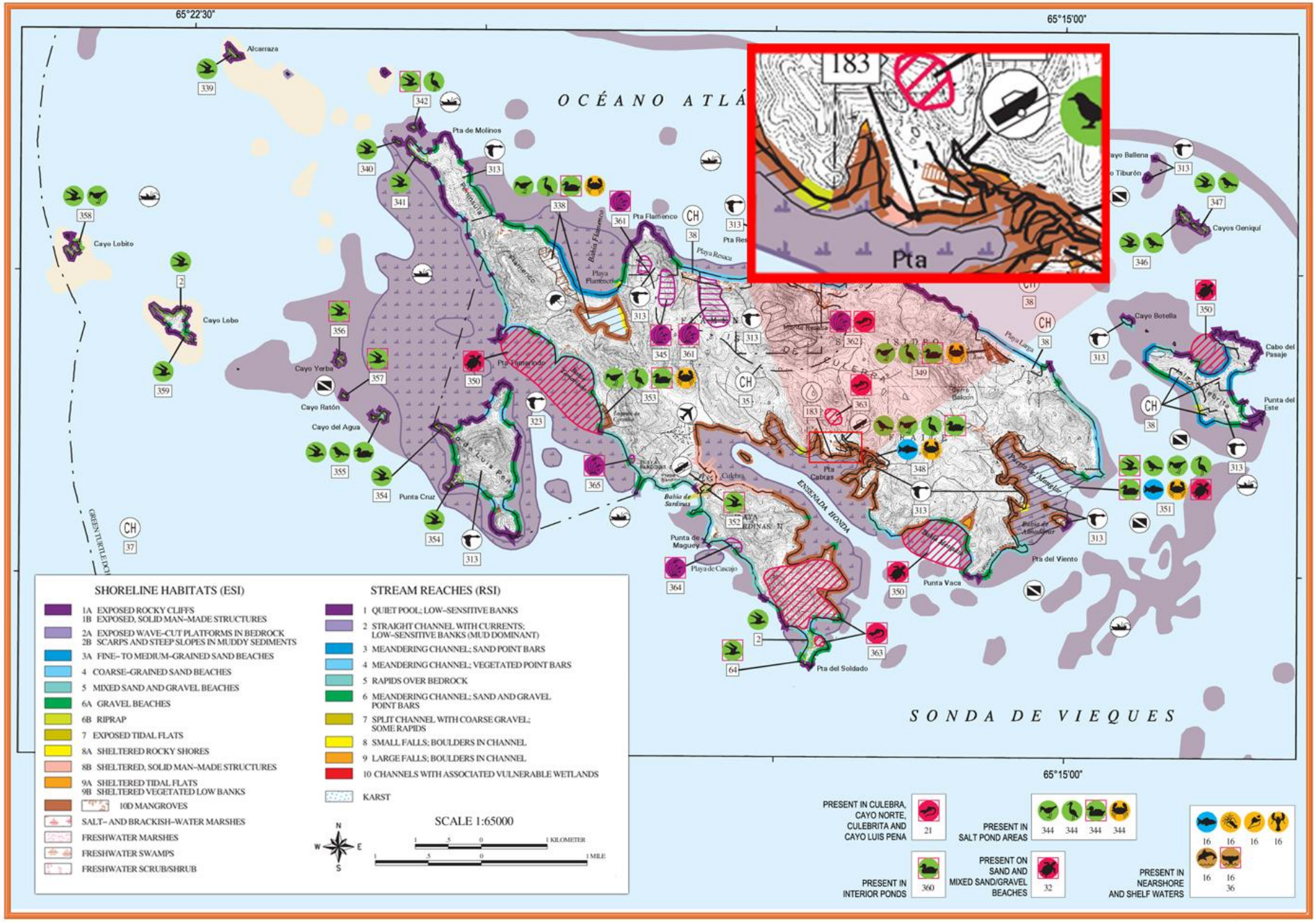
Field Study

The field study was conducted on August 19, 2014. A full assessment of the area was carried out in order to identify different types of habitats that may exist. As most of the project area is paved or impacted by maintenance activities, this field study was mainly focused along the existing roadway (***Figure 2, Site Plan***).

Data Analysis

Species of flora and fauna were identified on-site, except in cases where further identification was required to confirm them. To confirm their identity, these were either collected in the field or photographed, which would then be compared with available literature.

[2] *Salguero-Faría, J. A., et.al. (2009). Puerto Rico Breeding Bird Atlas. On going project of the Puerto Rican Ornithological Society. Found in: www.aosbirds.orgl*



*Drawing not to Scale

Source: Atkins

AUTORIDAD de los PUERTOS de PUERTO RICO

CULEBRA AUXILIARY CARGO FERRY TERMINAL AT SAN ILDEFONSO FLORA & FAUNA STUDIES

NOAA ENVIRONMENTAL SENSITIVITY INDEX MAP

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FIGURE 5

Results

Flora

As previously stated, the entire property has been paved and impacted by manmade structures. The existing vegetation on the project site is located at and near the shoreline of Ensenada Honda. Most of the existing vegetation, particularly trees, were either planted as ornamentals or are species of exotic vegetation that have established naturally.

Tree species such as the woman's tongue *(Albizia lebbeck)*, flamboyant *(Delonix regia),* white leadtree *(Leucaena leucocephala)* and Caribbean trumpet trees *(Tabebuia aurea)* were common along the the access road and in areas near the project. Other tree species identified were the Indian almond (*Terminalia catappa)* and the coconut palm (*Cocos nucifera)*.

The herbaceous vegetation identified at the site was mainly found along the access road and/or planted as cover. Common identified species were the guineagrass *(Urochloa maxima),* common bermuda grass *(Melinis repens),* and swollen fingergrass *(Chloris barbata).* Swollen fingergrass *(Cynodon dactylon)* and smut grass *(Sporobolus indicus).*

No Threatened and/or Endangered flora species were found during the study.

A total of **19 flora species** from 10 families were identified at the project site. Most of these species are typical of highly impacted and/or developed areas with low maintenance. These are fairly common throughout their range.

For the complete list of identified flora species, see ***Table 2, Flora Species Identified at the Site***

Table 2: Flora Species Identified at the Site

	Scientific	Common	Común	Family	Status
1	*Albizia lebbeck*	woman's tongue	albizia	Fabaceae	Introduced
2	*Anthephora hermaphrodita*	oldfield grass	cadillo dulce	Poaceae	Native
3	*Bourreria succulenta*	Bahama strongbark	palo de vaca	Boraginaceae	Native
4	*Bucida buceras*	oxhorn bucida	úcar	Combretaceae	Native
5	*Bursera simaruba*	gumbo limbo	almácigo	Burseraceae	Native
6	*Cocos nucifera*	coconut palm	palma de coco	Arecaceae	Introduced
7	*Cynodon dactylon*	common bermuda grass	bermuda	Poaceae	Introduced
8	*Delonix regia*	flamboyant	flamboyán	Fabaceae	Introduced
9	*Euphorbia neriifolia*	Indian spurge tree	--	Euphorbiaceae	Introduced
10	*Guapira fragrans*	black mampoo	corcho	Nyctaginaceae	Native
11	*Leucaena leucocephala*	white leadtree	zarcilla	Fabaceae	Introduced

Table 3: Flora Species Identified at the Site *(cont.)*

	Scientific	Common	Común	Family	Status
12	*Prosopis pallida*	mesquite tree	bayahonda	Fabaceae	Introduced
13	*Sporobolus indicus*	smut grass	cerrillo	Poaceae	Native
14	*Syagrus romanzoffiana*	cocos palm	palmera pindó	Arecaceae	Introduced
15	*Tabebuia aurea*	Caribbean trumpet tree	roble amarillo	Bignoniaceae	Introduced
16	*Tamarindus indica*	tamarind	tamarindo	Fabaceae	Introduced
17	*Terminalia catappa*	Indian almond	almendro	Combretaceae	Introduced
18	*Thespesia populnea*	portia tree	emajagüilla	Malvaceae	Introduced
19	*Urochloa maxima*	guinea grass	yerba guinea	Poaceae	Introduced

**The USDA/NRCS Plant Database was used as reference*

Fauna

During the fauna study **16 species of birds** and **3 species of reptiles** were identified within the project boundaries.

The Brown Pelican *(Pelecanus occidentalis)*, the Magnificent Frigatebird *(Fregata magnificens)* the Royal Tern *(Thalasseus maximus)* and the Laughing Gull *(Leucophaeus atricilla)* were some of the species that were observed flying over open water areas during field assessments. Until 2009, the Brown Pelican *(Pelecanus occidentalis)* had been classified as *Endangered* under Federal Regulation 6766. The species was de-listed due to the recovery of its population throughout North America, but remains protected under the Commonwealth list.

Common inland species in the area were the Gray Kingbird (*Tyrannus dominicensis),* the Greater Antillean Grackle *(Quiscalus niger)* and the Scaly-naped Pigeon *(Patagioenas squamosa)*. These species were common perching on power lines, trees and flying overhead.

Reptile species observed included the Puerto Rican Ground Lizard *(Ameiva exsul)*, the Puerto Rican Crested Anole *(Anolis cristatellus),* and the Sharp-mouthed Lizard *(Anolis pulchellus).* Puerto Rican Crested Anoles *(Anolis cristatellus)* were commonly seen among tree branches, while the Puerto Rican Ground Lizard *(Ameiva exsul)* was common on the leaf litter

For the complete list of identified fauna species, see ***Table 3a, Fauna Species Identified at the Site (Birds) and 3b***, ***Fauna Species Identified at the Site (Reptiles).***

Table 3a: Fauna Species Identified at the Site (Birds)

	Scientific	Common	Común	Family	Status
1	*Anthracothorax dominicus*	Antillean Mango	Zumbador Dorado	Trochilidae	Native
2	*Butorides virescens*	Green Heron	Martinete	Ardeidae	Native
3	*Coereba flaveola*	Bananaquit	Reinita Común	Thraupidae	Native
4	*Columbina passerina*	Common Ground Dove	Rolita	Columbidae	Native
5	*Eulampis holosericeus*	Green-thorated Carib	Zumbador Pechiazul	Trochilidae	Native
6	*Falco sparverius*	American Kestrel	Falcón Común	Falconidae	Native
7	*Fregata magnificens*	Magnificent Frigatebird	Tijerilla	Fregatidae	Native
8	*Leucophaeus atricilla*	Laughing Gull	Gaviota Gallega	Laridae	Native
9	*Patagioenas leucocephala*	White-crowned Pigeon	Paloma cabeciblanca	Columbidae	Native
10	*Patagioenas squamosa*	Scaly-naped Pigeon	Paloma Turca	Columbidae	Native
11	*Pelecanus occidentalis*	Brown Pelican	Pelícano Pardo	Pelecanidae	Native
12	*Progne dominicensis*	Caribbean Martin	Golondrina de Iglesias	Hirundinidae	Native
13	*Quiscalus niger*	Greater Antillean Grackle	Chango	Icteridae	Native
14	*Thalasseus maximus*	Royal Tern	Charrán Real	Sternidae	Native
15	*Tyrannus dominicensis*	Gray Kingbird	Pitirre	Tyrannidae	Native
16	*Zenaida asiatica*	White-Winged Dove	Tórtola Aliblanca	Columbidae	Native

Table 3b: Fauna Species Identified at the Site (Reptiles)

	Scientific	Common	Común	Family	Status
1	*Ameiva exsul*	Puerto Rican Ground Lizard	Siguana	Teiidae	Native
2	*Anolis cristatellus*	Puerto Rican Crested Anole	Lagartijo Común	Polychrotidae	Native
3	*Anolis pulchellus*	Sharp-mouthed Lizard	Lagartijo Jardinero	Polychrotidae	Native

Threatened and Endangered Species

A consultation with the Natural Heritage Section of the Department of Natural and Environmental Resources (DNER) and the U.S. Fish & Wildlife Service (USFWS) was conducted to identify the potential existence of any listed flora and fauna species within the study area. In addition, publications such as the *Puerto Rico Critical Wildlife Areas*, by the DNER, and the *Environmental Sensitivity Index*, by the National Oceanic and Atmospheric Administration (NOAA), were reviewed for these purposes.

Flora

Neither Commonwealth nor Federally listed flora species classified as Threatened & Endangered (T&E) were observed during the field assessment.

Fauna

Except for the Brown Pelican *(Pelecanus occidentalis),* no Commonwealth nor Federally listed Threatened and/or Endangered species were observed during the Flora & Fauna studies. As previously stated, the Brown Pelican *(Pelecanus occidentalis)* is the only fauna species

observed during the field assessments that is classified as Threatened & Endangered under *Regulation 6766 for the Threatened and Endangered species of the Commonwealth of Puerto Rico* (created under the Puerto Rico Wildlife Law, Law No. 241 of August 15, 1999). However, in addition to the Brown Pelican, 2 species Commonwealth and/or Federally listed Threatened and/or Endangered species are known to exist nearby. Below is a brief description of each species.

1. **Brown Pelican** *(Pelecanus occidentalis),* Commonwealth Protection (Endangered). A large brown seabird with a white head and long bill with an expandable throat pouch, adult Brown Pelicans typically measure 100-137 cm and weigh 3,500 g. They feed on shrimp and small fish in shallow lagoons, reef edges, bays, and sometimes in the edge of the surf. The species breeds throughout the year, with peak nesting activities during the months of April to June and November to January. It lays 2-4 eggs on a large stick nest in traditional colonies on offshore islands. Chicks hatch after 28-30 days, and the young can fly at around 10 weeks.

The Brown Pelican is the only fauna species observed during the field assessments that is classified as Threatened & Endangered under *Regulation 6766 for the Threatened and Endangered species of the Commonwealth of Puerto Rico* (created under the Puerto Rico Wildlife Law, Law No. 241 of August 15, 1999). The species was recently de-listed from the Federal Endangered Species List by the USFWS due to the recovery of its population throughout North America.

2. **White-cheeked Pintail** *(Anas bahamensis)*, Commonwealth Protection (Endangered). Measuring between 38-51 cm in length and weighing approximately 474-533 g, this species commonly inhabits fresh and saltwater ponds, lagoons and mangrove swamps, traveling in small flocks feeding on seeds and leaves of algae and other aquatic plants. The species are known to travel back and forth between Culebra and the marshes in eastern Puerto Rico. The White-cheeked Pintail nests on the ground in dense vegetation near water; females lay 5-12 eggs, incubating them for around 25 days. Once they hatch, the chicks feed on water insects and snails.

According to the Environmental Sensitivity Index (ESI) Atlas from the National Oceanic and Atmospheric Administration (NOAA) and the Natural Heritage

Office of the Department of Natural and Environmental Resources (DNER), the White-cheeked Pintail inhabits the nearby mangroves of Caño Quebrado, less than half a mile east of the project location. These mangroves are part of the Culebra National Wildlife Refuge. The occurrence of this species within the project site is expected to be limited to transient individuals, since most depend on specific resources (e.g. shallow coastal lagoons) which are close to the project site but not present within.

3. **Virgin Islands Boa** *(Epicrates monensis granti)*, Commonwealth & Federal Protection (Endangered). The Virgin Islands Boa *(Epicrates monensis granti)* is a small boa under the genus *Epicrates*. The adult body color is light plumbeous brown with darker blotches partially edged with black, with a greyish-brown ventral surface is speckled with darker spots. This snake grows to slightly less than a meter snout-vent length (602-770mm for males, 470-793mm for females). This nocturnal species is considered a semi-arboreal opportunistic predator, feeding mostly on various species of lizards such as the Puerto Rican Crested Anole *(Anolis cristatellus)* and Puerto Rican Ground Lizard *(Ameiva exsul)*, in addition to small rodents and birds.

According to the Department of Natural and Environmental Resources of Puerto Rico (DNER) publication "*Designación de Habitat Natural Crítico y Hábitat Natural Crítico Escencial para la Boa de las Islas Vírgenes*", areas east, west and north of the site are being proposed as "Natural Critical Habitat" for the species, particularly in the dense mangrove cover less than 400 feet west of the site. The occurrence of this species within the project site is expected to be limited to transient individuals, since most depend on specific habitat conditions (continuous, dense tree cover). However, due to the fragmentation of the tree cover in the areas surrounding the project site, it is unlikely that the species will be found within areas that have been proposed for development.

Conclusion

The Flora & Fauna Study conducted in the location of the proposed Culebra Auxiliary Cargo Ferry Terminal at the San Ildefonso area did not reveal the presence of any protected species of flora of high ecological value. However, 3 species of fauna currently listed as Threatened and/or Endangered under Commonwealth and/or Federal laws are known to exist nearby; the Brown Pelican (*Pelecanus occidentalis*), the White-cheeked Pintail (*Anas bahamensis*) and the Virgin Islands Boa (*Epicrates monensis granti).* The Brown Pelican, which has been delisted on the federal scope but remains protected under state regulations, is commonly found fishing throughout Ensenada Honda Bay, while the White-cheeked Pintail is found among the mangrove lagoons in west of the project area in a coastal mangrove fringe part of the Culebra National Wildlife Refuge. No Virgin Islands Boa have been reported in areas near the project site.

Photographic Documentation

***Above, left**: A gumbo limbo (Bursera simaruba) and a women's tongue (Albizia lebbeck) along the eastern side of the access road.*
***Above, right:** An American Kestrel (Falco sparverius) perching on an overhead power line.*

***Above, left**: An Indian spurge tree (Euphorbia neriifolia).*
***Above, right:** An Indian almond (Terminalia catappa) near the northern boundary of the project.*

Photographic Documentation

***Above, left**: Caribbean trumpet trees (Tabebuia aurea) planted along the retaining wall.*

***Above, right**: General view of the road access, heading south.*

***Above, left**: View of the road, heading south. The right side of the photograph is the PREPA easement, where the tree cover has been previously removed. Most of the remaining tree cover is composed of white leadtrees (Leucaena leucocephala) and young mesquite trees (Prosopis pallida).*

***Above, right**: Typical leaf cover over paved surfaces where reptiles such as the Puerto Rican Ground Lizard (Ameiva exsul) were commonly found.*

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November 2014

Habitat Characterization

for the

Culebra Auxiliary Cargo Ferry Terminal at San Ildefonso

Culebra, Puerto Rico

Prepared For :

AUTORIDAD de los PUERTOS de PUERTO RICO

Prepared By:

ATKINS

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Introduction

Pursuant to the emergency situation that occurred at the Culebra Passenger Ferry Terminal Platform after the passing of Hurricane Earl on August 30, 2010, Atkins Caribe, LLP was asked to evaluate the structural condition of the Culebra passenger terminal platform and the Culebra cargo terminal ramp. A site visit was conducted in August 2010 to assess the conditions of these structures and a report, dated September 20, 2010, was submitted to Maritime Transport Authority of Puerto Rico (MTAPR).

The evaluation of the structural condition of the cargo terminal revealed deterioration of the deck slab and concrete beams, which has probably spread to the entire concrete surface. The deterioration appears to be a result of previous storm events/hurricanes and wave action. While it may be possible to patch and repair the deteriorated structure, any repairs attempted for this facility would be of short-term duration. If repair/reconstruction of the cargo terminal is not conducted promptly, the potential exists for structural failure. While it may be possible to patch and repair the deteriorated structure, any repairs attempted for this facility would be of short-term duration. Being the only heavy commercial cargo transportation port in Culebra, the cargo ferry provides a crucial service to the residents of the island. While it may be possible to patch and repair the deteriorated structure, such attempts for this facility would be of short-term duration. The Puerto Rico Ports Authority (PRPA) has requested Federal Emergency Management Agency (FEMA) funds, under the Hazard Mitigation Grant Program (HMGP), for reconstruction/repair of the cargo platform of the Municipality of Culebra.

Presently, this cargo ramp provides the only entry point for goods and services to the island municipality of Culebra. To prevent leaving the residents of Culebra without this crucial service, FEMA and PRPA have proposed the construction of an auxiliary cargo pier at San Ildefonso that will allow the continued operation of the ferries during the reconstruction of the existing Cargo Pier at Sardinas Bay. This auxiliary cargo pier will guarantee that the residents of Culebra will continue receiving this important service required for their day to day living.

In order to comply with the New Wildlife Act of Puerto Rico (Act 241 of 1999), Atkins Caribe scientists conducted a Terrestrial Flora and Fauna Survey and a Benthic Habitat Survey on both in the actual facilities at Sardinas Bay and in San Ildefonso. These studies were conducted

during the months of November 2013 and August 2014 in accordance with the procedures recommended by the Department of Natural and Environmental Resources (DNER) using close-fitting methods to the physical characteristics and conditions to the study areas.

Project Description

The construction of the Culebra Cargo Ramp will be divided in two phases. **Phase I** will be the construction of the auxiliary cargo pier at San Ildefonso, while **Phase II** will be the full reconstruction of the existing cargo ramp at the current Culebra Ferry Terminal. Due mainly to logistics concerns, it will be necessary to complete Phase I of the project before commencing the demolition and construction work in Phase II, which will allow the ferry service to continue uninterrupted.

Phase I (Construction of the Auxiliary Cargo Pier in San Ildefonso)

Phase I of the project will consist in the installation of a pre-fabricated aluminum floating pontoon dock, measuring 40 feet long by 50 feet wide. The use of a floating dock minimizes impacts to the bottom of the bay. This pre-fabricated floating platform will be secured and anchored using steel piles. The floating pontoon dock will be connected to the terminal by using a pre-fabricated aluminum bridge for vehicular circulation. This bridge will measure 45 feet long by 25 feet wide. No dredging works will be necessary.

In addition, the existing “Plaza Artesanal” structure will be adapted into an adequate waiting and boarding facilities for passengers. Portable bathroom facilities will be installed.

The existing access road parking lot is to be reconditioned for heavy traffic (trucks, semi-trailers, and heavy machinery). This would include the widening of the access road (approximately 10 feet to each side) and reconditioning the asphalt by adding a 2 inch layer. The total length of the access road that would be modified is 365 feet from the curb at the existing parking facilities until reaching the “Y” intersection. The site improvement area is approximately 27,263.56 square feet.

Phase II (Full reconstruction of the existing Cargo Ramp at Sardinas Bay)

Phase II consists will consist of the full reconstruction of the existing cargo ramp of the Culebra Ferry Terminal. The existing cargo ramp, which has an area of 4,907 square feet, is structurally deficient and if left unattended, may collapse in the near future. At present, the generally weakened structure of the cargo ferry ramp is not safe for the ferry to dock and disembark its

cargo, as the concrete has spalled, most pilings have rotted and structural elements, such as rebars within the concrete, have been exposed.

The existing cargo ramp will be demolished, and the debris will be removed and transported to a certified landfill. The 27 existing HP steel pilings will be cut at the mudline and removed. This operation would require each piling to be held above the waterline by a crane while being cut at the mudline with the appropriate equipment. The pilings would then be lifted and transported to a predetermined location. Before being moved, any coral colonies that are attached to the pilings would be removed and relocated to a reef ball that should be placed in a nearby location. At 5,501 square feet, the new cargo ramp will be constructed using the same footprint of the existing cargo ramp. The additional 594 square feet that the new ramp will have are due to the square (equal sided) shape. It will be supported by 25 new 20 inch diameter pilings.

General Description of the Study Area

According to the Holdridge Life Zone Classification System, the entire island of Culebra is located within the *subtropical dry forest*, with average high temperatures of 87.7° F and average low temperatures of 75.9° F. Average annual rainfall is 62.2 mm[1], with the months of May through November being the wettest of the year.

Phase I (Auxiliary Cargo Pier in San Ildefonso)

The proposed Culebra Auxiliary Cargo Ferry Terminal Facilities (Phase I) are located in San Ildefonso in Flamingo Ward, on a peninsula in the northern shoreline of Ensenada Honda in the island municipality of Culebra, Puerto Rico. It is bordered to the north by Road 250, to the east by Caño Quebrado, on the west by Ensenada del Cementerio, and on the south by Ensenada Honda. This area was the historic location of the first settlement in the island, named San Ildefonso de la Culebra. Its coordinates are **Latitude *18°18'22.63"N* and Longitude *65°17'00.44"W*.** (***Figure 1, Location Map***). The highest point within this area is located on the "Y" intersection, at approximately 28 feet.

Phase II (Full reconstruction of the existing Cargo Ramp at Sardinas Bay)

The proposed project for the reconstruction of the Culebra Cargo Ramp is located in Sardinas I ward (Dewey) at the Port of Culebra, Puerto Rico. It is bounded in the northeast by State Road PR-250 at its terminus and by Bahía de Sardinas on the southwest. Its coordinates are

[1] http://www.meoweather.com/history/United%20States/na/18.305/-65.301/Culebra.html

Latitude ***18°18’05.53”N*** and **Longitude** ***65°18’09.77”W*** (***Figure 1, Location Map).***

*Drawing not to Scale

Source: Atkins

AUTORIDAD de los PUERTOS de PUERTO RICO	Culebra Cargo Ramp Terminal Improvements Habitat Characterization	Location Map	ATKINS	Figure 1

*Drawing not to Scale

Source: Atkins

AUTORIDAD de los PUERTOS de PUERTO RICO

CULEBRA CARGO RAMP
TERMINAL IMPROVEMENTS
HABITAT CHARACTERIZATION

USGS TOPOGRAPHIC MAP

ATKINS

FIGURE
2

Description of Anthropogenic Activities

Phase I (Auxiliary Cargo Pier in San Ildefonso)

The area of San Ildefonso was the location of the first settlement in the island of Culebra during the time of the Spanish colonization. After the Spanish-American War, the United States Navy established a base (Camp Roosevelt) and constructed a pier in the location of the current one in San Ildefonso.

The current infrastructure is composed of two boat ramps, recreational facilities (benches, roofed area) and an wooden deck laid on top of the concrete pier. The Puerto Rico Aqueduct and Sewer Authority (PRASA) has a water intake facility for the water desalinization plant that is located near the intersection of the access road and PR-250. Currently, the desalinization plant is not in operation.

Part of the existing infrastructure located in San Ildefonso are facilities used by the Puerto Rico Department of Natural and Environmental Resources (DNER) and the U.S. Fish & Wildlife Service (USFWS). The area of San Ildefonso has been impacted by anthropogenic activities for over 150 years. A

Phase II (Full reconstruction of the existing Cargo Ramp at Sardinas Bay)

The actual cargo platform/pier was designed by the Puerto Rico Ports Authority (PRPA) in 1986 and its construction completed circa 1988, being the last reconstruction project done for the cargo ramp. Currently, the area is known as the Culebra Ferry Terminal. It is surrounded by the ferry terminal facilities, local commerce, a gas station, and a small plaza.

Terrestrial Flora & Fauna Methodology

The objective of this study is to document the flora and fauna that is currently found at the project sites. The successful completion of this task resulted in a comprehensive list of the flora and fauna and a characterization of the present habitat in accordance with Act 241 of August 15, 1999.

The methodology described is based on procedures recommended by the Puerto Rico Department of Natural and Environmental Resources (DNER) and the U.S. Fish & Wildlife Service (USFWS) and field evaluations.

Preliminary Assessment

A preliminary site assessment was conducted to provide a general characterization of both areas, including their specific location, and its physical and natural features within the project boundaries. In addition, aerial photos, USGS topographic maps and USDA soil maps were used to establish the methodology for the field study.

Environmental Sensitivity Index Map

Environmental Sensitivity Index (ESI) maps (***Figure 5, NOAA Environmental Sensitivity Index Map***) provide a summary of coastal resources that are at risk during emergency situations caused by human negligence. Examples of at-risk resources include biological resources (such as birds and shellfish beds), sensitive shorelines (such as marshes and tidal flats), and human-use resources (such as public beaches and parks), as well as provide data on recorded observations of flora and fauna species that are classified as *Critical*, *Threatened* or *Endangered* around coastal areas, river basins, streams and lakes of Puerto Rico. These studies were conducted by the National Oceanic and Atmospheric Administration (NOAA) in collaboration with organizations and state and federal government agencies.

Additional Consultation

In order to specifically search for critical elements (endemic, rare, threatened and endangered species) at the site, the following sources were investigated:

a. *Consultation with the DNER and the U.S. Fish & Wildlife Service (USFWS) for the municipalities of San Juan.*
b. *Consultation of the Puerto Rico Critical Wildlife Areas, a publication of the DNER.*
c. *Consultation of the Puerto Rico Breeding Bird Atlas[2] for the area.*

Field Study

The field study was conducted from August 19-21, 2014. A full assessment of both areas was carried out in order to identify different types of habitats that may exist. As most of the project areas are paved or impacted, this field study was mainly focused along the boundary of the

[2] *Salguero-Faría, J. A., et.al. (2009). Puerto Rico Breeding Bird Atlas. On going project of the Puerto Rican Ornithological Society. Found in: www.aosbirds.orgl*

project sites. (***Figure 3, Site Plan***).

Data Analysis

Species of flora and fauna were identified on-site, except in cases where further identification was required to confirm them. To confirm their identity, these were either collected in the field or photographed, which would then be compared with available literature.

Results

Phase I (Auxiliary Cargo Pier in San Ildefonso)

Flora

As previously stated, the entire property has been paved and impacted by manmade structures. The existing vegetation on the project site is located at and near the shoreline of Ensenada Honda or along the access road that leads to the pier. Most of the existing vegetation, particularly trees, were either planted as ornamentals or are species of exotic vegetation that have established naturally.

Tree species such as the woman's tongue *(Albizia lebbeck)*, flamboyant *(Delonix regia),* white leadtree *(Leucaena leucocephala)* and Caribbean trumpet trees *(Tabebuia aurea)* were common along the the access road and in areas near the project. Other tree species identified were the Indian almond (*Terminalia catappa)* and the coconut palm (*Cocos nucifera)*.
The herbaceous vegetation identified at the site was mainly found along the access road and/or planted as cover. Common identified species were the guineagrass *(Urochloa maxima),* common bermuda grass *(Melinis repens),* swollen fingergrass *(Chloris barbata)* and smut grass *(Sporobolus indicus).*

No Threatened and/or Endangered flora species were found during the study.
A total of **19 flora species** from 10 families were identified at the project site. Most of these species are typical of highly impacted and/or developed areas with low maintenance. These are fairly common throughout their range.

For the complete list of identified flora species, see ***Table 1, Flora Species Identified at the Site***

Table 1: Flora Species Identified at the Site

	Scientific	Common	Común	Family	Status
1	*Albizia lebbeck*	woman's tongue	albizia	Fabaceae	Introduced
2	*Anthephora hermaphrodita*	oldfield grass	cadillo dulce	Poaceae	Native
3	*Bourreria succulenta*	Bahama strongbark	palo de vaca	Boraginaceae	Native
4	*Bucida buceras*	oxhorn bucida	úcar	Combretaceae	Native
5	*Bursera simaruba*	gumbo limbo	almácigo	Burseraceae	Native
6	*Cocos nucifera*	coconut palm	palma de coco	Arecaceae	Introduced
7	*Cynodon dactylon*	common bermuda grass	bermuda	Poaceae	Introduced
8	*Delonix regia*	flamboyant	flamboyán	Fabaceae	Introduced
9	*Euphorbia neriifolia*	Indian spurge tree	--	Euphorbiaceae	Introduced
10	*Guapira fragrans*	black mampoo	corcho	Nyctaginaceae	Native
11	*Leucaena leucocephala*	white leadtree	zarcilla	Fabaceae	Introduced
12	*Prosopis pallida*	mesquite tree	bayahonda	Fabaceae	Introduced
13	*Sporobolus indicus*	smut grass	cerrillo	Poaceae	Native
14	*Syagrus romanzoffiana*	cocos palm	palmera pindó	Arecaceae	Introduced
15	*Tabebuia aurea*	Caribbean trumpet tree	roble amarillo	Bignoniaceae	Introduced
16	*Tamarindus indica*	tamarind	tamarindo	Fabaceae	Introduced
17	*Terminalia catappa*	Indian almond	almendro	Combretaceae	Introduced
18	*Thespesia populnea*	portia tree	emajagüilla	Malvaceae	Introduced
19	*Urochloa maxima*	guinea grass	yerba guinea	Poaceae	Introduced

**The USDA/NRCS Plant Database was used as reference*

Fauna

During the fauna study, **16 species of birds** and **3 species of reptiles** were identified within the project boundaries.

The Brown Pelican *(Pelecanus occidentalis)*, the Magnificent Frigatebird *(Fregata magnificens)* the Royal Tern *(Thalasseus maximus)* and the Laughing Gull *(Leucophaeus atricilla)* were some of the species that were observed flying over open water areas during field assessments. Until 2009, the Brown Pelican *(Pelecanus occidentalis)* had been classified as *Endangered* under Federal Regulation 6766. The species was de-listed due to the recovery of its population throughout North America, but remains protected under the Commonwealth list.

Common inland species in the area were the Gray Kingbird (*Tyrannus dominicensis),* the Greater Antillean Grackle *(Quiscalus niger)* and the Scaly-naped Pigeon *(Patagioenas squamosa)*. These species were common perching on power lines, trees and flying overhead. Reptile species observed included the Puerto Rican Ground Lizard *(Ameiva exsul)*, the Puerto Rican Crested Anole *(Anolis cristatellus),* and the Sharp-mouthed Lizard *(Anolis pulchellus).* Puerto Rican Crested Anoles *(Anolis cristatellus)* were commonly seen among tree branches, while the Puerto Rican Ground Lizard *(Ameiva exsul)* was common on the leaf litter

For the complete list of identified fauna species, see ***Table 2a, Fauna Species Identified at the Site (Birds) and 2b***, ***Fauna Species Identified at the Site (Reptiles).***

Table 2a: Fauna Species Identified at the Site (Birds)

	Scientific	Common	Común	Family	Status
1	*Anthracothorax dominicus*	Antillean Mango	Zumbador Dorado	Trochilidae	Native
2	*Butorides virescens*	Green Heron	Martinete	Ardeidae	Native
3	*Coereba flaveola*	Bananaquit	Reinita Común	Thraupidae	Native
4	*Columbina passerina*	Common Ground Dove	Rolita	Columbidae	Native
5	*Eulampis holosericeus*	Green-thorated Carib	Zumbador Pechiazul	Trochilidae	Native
6	*Falco sparverius*	American Kestrel	Falcón Común	Falconidae	Native
7	*Fregata magnificens*	Magnificent Frigatebird	Tijerilla	Fregatidae	Native
8	*Leucophaeus atricilla*	Laughing Gull	Gaviota Gallega	Laridae	Native
9	*Patagioenas leucocephala*	White-crowned Pigeon	Paloma cabeciblanca	Columbidae	Native
10	*Patagioenas squamosa*	Scaly-naped Pigeon	Paloma Turca	Columbidae	Native
11	*Pelecanus occidentalis*	Brown Pelican	Pelícano Pardo	Pelecanidae	Native
12	*Progne dominicensis*	Caribbean Martin	Golondrina de Iglesias	Hirundinidae	Native
13	*Quiscalus niger*	Greater Antillean Grackle	Chango	Icteridae	Native
14	*Thalasseus maximus*	Royal Tern	Charrán Real	Sternidae	Native
15	*Tyrannus dominicensis*	Gray Kingbird	Pitirre	Tyrannidae	Native
16	*Zenaida asiatica*	White-Winged Dove	Tórtola Aliblanca	Columbidae	Native

Table 2b: Fauna Species Identified at the Site (Reptiles)

	Scientific	Common	Común	Family	Status
1	*Ameiva exsul*	Puerto Rican Ground Lizard	Siguana	Teiidae	Native
2	*Anolis cristatellus*	Puerto Rican Crested Anole	Lagartijo Común	Polychrotidae	Native
3	*Anolis pulchellus*	Sharp-mouthed Lizard	Lagartijo Jardinero	Polychrotidae	Native

Phase II (Full reconstruction of the existing Cargo Ramp at Sardinas Bay)

Flora

As previously mentioned, the entire Culebra Ferry Terminal area has been paved and impacted by manmade structures. The existing vegetation at the Phase II site is located along the shoreline of Sardinas Bay and at the planting strips along the plaza and terminal facilities. Most of the existing vegetation, particularly the palm trees, were planted as ornamentals.

Only two species are present in the area, the portia tree (*Thespesia populnea*), located along the shoreline and Mexican fan palm (*Washingtonia robusta*) at the planting strip of the terminal area.

For the complete list of identified flora species, see ***Table 3, Flora Species Identified at the Site***

Table 3: Flora Species Identified at the Site

	Scientific	Common	Común	Family	Status
1	*Thespesia populnea*	portia tree	emajagüilla	Malvaceae	Introduced
2	*Washingtonia robusta*	Mexican fan palm	palmera de abanico mexicana, washingtonia	Aracaceae	Introduced

Fauna

As this area is has been completely impacted by the development of the port area and has constant movement of vehicles, there is very little fauna present in the surrounding areas. During the fauna study, **7 species of birds** and 2 **species of reptiles** were identified within the project boundaries.

As in Phase I, the Brown Pelican *(Pelecanus occidentalis)*, the Magnificent Frigatebird *(Fregata magnificens)* the Royal Tern *(Thalasseus maximus)* and the Laughing Gull *(Leucophaeus atricilla)* were some of the species that were observed flying over open water areas during field assessments.

Common inland species in the area were the Gray Kingbird (*Tyrannus dominicensis),* the Greater Antillean Grackle *(Quiscalus niger)* and the Scaly-naped Pigeon *(Patagioenas squamosa)*. These species were common perching on power lines, trees and flying overhead. Greater Antillean Grackle *(Quiscalus niger)* were commonly observed feeding from scraps and around garbage bins.

Common reptile species that were observed include the Puerto Rican Crested Anole *(Anolis cristatellus),* and the Sharp-mouthed Lizard *(Anolis pulchellus).*

For the complete list of identified fauna species, see ***Table 4a, Fauna Species Identified at the Site (Birds) and 4b***, ***Fauna Species Identified at the Site (Reptiles).***

Table 4a: Fauna Species Identified at the Site (Birds)

Scientific	Common	Común	Family	Status
Fregata magnificens	Magnificent Frigatebird	Tijerilla	Fregatidae	Native
Leucophaeus atricilla	Laughing Gull	Gaviota Gallega	Laridae	Native
Patagioenas squamosa	Scaly-naped Pigeon	Paloma Turca	Columbidae	Native
Pelecanus occidentalis	Brown Pelican	Pelícano Pardo	Pelecanidae	Native
Quiscalus niger	Greater Antillean Grackle	Chango	Icteridae	Native
Thalasseus maximus	Royal Tern	Charrán Real	Sternidae	Native
Tyrannus dominicensis	Gray Kingbird	Pitirre	Tyrannidae	Native

Table 2b: Fauna Species Identified at the Site (Reptiles)

	Scientific	Common	Común	Family	Status
1	*Anolis cristatellus*	Puerto Rican Crested Anole	Lagartijo Común	Polychrotidae	Native
2	*Anolis pulchellus*	Sharp-mouthed Lizard	Lagartijo Jardinero	Polychrotidae	Native

Threatened and Endangered Species

A consultation with the Natural Heritage Section of the Puerto Rico Department of Natural and Environmental Resources (DNER) and the U.S. Fish & Wildlife Service (USFWS) was conducted to identify the potential existence of any listed flora and fauna species within both study areas. In addition, publications such as the *Puerto Rico Critical Wildlife Areas*, by the DNER, and the *Environmental Sensitivity Index*, by the National Oceanic and Atmospheric Administration (NOAA), were reviewed for these purposes.

Flora

Neither Commonwealth nor Federally listed flora species classified as Threatened & Endangered (T&E) were observed during the field assessments conducted at Sardinas Bay and San Ildefonso.

Fauna

As previously stated, the Brown Pelican *(Pelecanus occidentalis)* is the only fauna species observed during the field assessments at both sites that is classified as Threatened & Endangered under *Regulation 6766 for the Threatened and Endangered species of the Commonwealth of Puerto Rico* (created under the Puerto Rico Wildlife Law, Law No. 241 of August 15, 1999). The Brown Pelican *(Pelecanus occidentalis)* was recently de-listed from the Federal Endangered Species List by the USFWS due to the recovery of its population throughout North America.

According to the Environmental Sensitivity Index (ESI) Atlas from the National Oceanic and Atmospheric Administration (NOAA) and the Natural Heritage Office of the Department of Natural and Environmental Resources (DNER), there is 1 Commonwealth listed fauna species included in Regulation 6766 in a region near the project site of San Ildefosno. The White-cheeked Pintail *(Anas bahamensis)*, may be found in the nearby mangroves of Caño Quebrado, less than half a mile east of the project location. These mangroves are part of the Culebra National Wildlife Refuge.

The occurrence of this species within the project site in San Ildefonso is expected to be limited to transient individuals, since most depend on specific resources (e.g. shallow coastal lagoons) which are close to the project site but not present within. Of the aforementioned species, only the Brown Pelican *(Pelecanus occidentalis)* is commonly observed near Sardinas Bay and San Ildefonso project site due to its typical coastal habitat. The species is often seen flying close to the areas in search of food or perching on manmade structures to rest.

Conclusion

The Flora & Fauna Studies that were conducted at the Culebra Ferry Terminal in Sardinas Bay and the proposed Culebra Auxiliary Cargo Ferry Terminal at San Ildefonso did not reveal the presence of any protected species of flora and/or fauna or of high ecological value.

Natural Habitat Category

Due to the fact that the Culebra Ferry Terminal at Sardinas Bay and the proposed Auxiliary Cargo Ferry Terminal at San Ildefonso have been heavily impacted and developed, there is no habitat of high ecological value or the presence of any ecological communities.

The only natural resource that could be affected during the development of both locations is the aquatic life that is present on the pier structures. However, conservation measures will be taken into consideration during construction work to avoid or minimize their impacts.

As both the Culebra Ferry Terminal at Sardinas Bay and the proposed Auxiliary Cargo Ferry Terminal at San Ildefonso are developed, they do not fall under any of the Natural Habitat Categories.

Photographic Documentation

***Above, left**: View of the road, heading south to Ensenada Honda in San Ildefonso. The right side of the photograph is the PREPA easement, where the tree cover has been previously removed. Most of the remaining tree cover is composed of white leadtrees (Leucaena leucocephala) and young mesquite trees (Prosopis pallida).*

***Above, right:** An American Kestrel (Falco sparverius) perching on an overhead power line in San Ildefonso.*

***Above, left**: An Indian almond (Terminalia catappa) near the northern boundary of the proposed project in San Ildefonso.*
***Above, right:** An Indian spurge tree (Euphorbia neriifolia) in San Ildefonso.*

Photographic Documentation

***Above, left**: Mexican fan palms (Washingtonia robusta) along the sidewalks in the port area of Sardinas Bay.*

***Above, right**: General view of the road access in San Ildefonso, heading south.*

***Above, left**: Port/passenger facilities in Sardinas Bay.*

***Above, right**: Northeastern boundary of the Culebra Cargo Ferry Terminal in Sardinas Bay. The leaves showing in the photograph are those of a portia tree (Thespesia populnea).*

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