# PUERTO RICO - ESIMAP 9

## BIOLOGICAL RESOURCES:

### BIRD:

| RAR# | Species | S/F | T/E | Conc. | J | F | M | A | M | J | J | A | S | O | N | D | Nesting |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62 | American coot | | | HIGH | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | American kestrel | | | HIGH | X | X | X | X | | | | | | X | X | X | - |
| | American wigeon | | | | X | X | X | X | | | | | | X | X | X | - |
| | Black skimmer | | | | X | X | X | X | | | | | | | X | X | - |
| | Blue-winged teal | | | HIGH | X | X | X | X | | | | | | X | X | X | - |
| | Brown pelican | S/F | E/E | HIGH | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Caribbean coot | S | T | LOW | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Common moorhen | | | HIGH | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Common snipe | | | HIGH | X | X | X | X | | | | | | X | X | X | - |
| | Green-winged teal | | | LOW | X | X | X | | | | | | | X | X | X | - |
| | Lesser scaup | | | LOW | X | X | X | | | | | | | | X | X | - |
| | Masked duck | S | T | LOW | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Merlin | | | LOW | X | X | X | | | | | | | X | X | X | - |
| | Northern pintail | | | LOW | X | X | X | X | | | | | X | X | X | X | - |
| | Osprey | | | HIGH | X | X | X | X | | | | | X | X | X | X | - |
| | Peregrine falcon | S | E | LOW | X | X | X | X | | | | | | X | X | X | - |
| | Purple gallinule | | | LOW | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Red-tailed hawk | | | MEDIUM | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Ring-necked duck | | | LOW | X | X | X | | | | | | | X | X | X | - |
| | Ruddy duck | S | T | HIGH | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Shorebirds | | | HIGH | X | X | X | X | X | | | X | X | X | X | X | - |
| | Wading birds | | | HIGH | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | West Indian whistling-duck | S | T | HIGH | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | White-cheeked pintail | | | MEDIUM | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | White-crowned pigeon | | | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| 74 | American coot | | | HIGH | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Brown pelican | S/F | E/E | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Caribbean coot | S | T | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Common moorhen | | | HIGH | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Osprey | | | | X | X | X | X | | | | | X | X | X | X | - |
| | Pied-billed grebe | | | HIGH | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Roseate tern | S/F | E/I | | | | | X | X | X | X | X | X | | | | - |
| | Short-eared owl | | | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Wading birds | | | HIGH | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | West Indian whistling-duck | S | T | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Yellow-breasted crake | S | T | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| 75 | Blue-winged teal | | | | X | X | X | X | | | | | | X | X | X | - |
| | Common moorhen | | | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Common snipe | | | | X | X | X | X | | | | | | X | X | X | - |
| | Least grebe | S | T | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Wading birds | | | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Yellow-breasted crake | S | T | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| 76 | Ruddy duck | S | T | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| 77 | Black-necked stilt | | | | | | | X | X | X | X | X | X | X | | | - |
| | Blue-winged teal | | | HIGH | X | X | X | X | | | | | | X | X | X | - |
| | Common moorhen | | | MEDIUM | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | Common snipe | | | HIGH | X | X | X | X | | | | | | X | X | X | - |
| | Wading birds | | | MEDIUM | X | X | X | X | X | X | X | X | X | X | X | X | - |
| | White-crowned pigeon | | | | X | X | X | X | X | X | X | X | X | X | X | X | - |
| 78 | White-crowned pigeon | | | | X | X | X | X | X | X | X | X | X | X | X | X | MAR-SEP |

### FISH:

| RAR# | Species | S/F | T/E | Conc. | J | F | M | A | M | J | J | A | S | O | N | D | Spawning | Eggs | Larvae | Juveniles | Adults |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Pelagic fish | | | | X | X | X | X | X | X | X | X | X | X | X | X | JAN-DEC | JAN-DEC | JAN-DEC | JAN-DEC | JAN-DEC |
| 29 | Native streax fish | | | | X | X | X | X | X | X | X | X | X | X | X | X | APR-MAY<br>AUG-NOV | APR-MAY<br>AUG-NOV | APR-MAY<br>AUG-NOV | JAN-DEC | JAN-DEC |
| 35 | Pelagic fish | | | | X | X | X | X | X | X | X | X | X | X | X | X | JAN-DEC | JAN-DEC | JAN-DEC | JAN-DEC | JAN-DEC |
| | Reef fish | | | | X | X | X | X | X | X | X | X | X | X | X | X | JAN-DEC | JAN-DEC | JAN-DEC | JAN-DEC | JAN-DEC |
| 62 | Native streax fish | | | | | | | X | X | | | X | X | X | X | | - | - | APR-MAY<br>AUG-NOV | - | - |
| | Nursery fish | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | - | JAN-DEC | - |
| | Snook | | | | X | X | X | X | X | X | X | X | X | X | X | X | APR-FEB | APR-FEB | JAN-DEC | JAN-DEC | JAN-DEC |
| | Tarpon | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | MAY-DEC | JAN-DEC | JAN-DEC |
| | Tilapia | | | | X | X | X | X | X | X | X | X | X | X | X | X | DEC-JUL | DEC-JUL | DEC-JUL | JAN-DEC | JAN-DEC |
| 74 | Largemouth bass | | | | X | X | X | X | X | X | X | X | X | X | X | X | FEB-AUG | FEB-AUG | FEB-AUG | JAN-DEC | JAN-DEC |
| | Native streax fish | | | | X | X | X | X | X | X | X | X | X | X | X | X | APR-MAY<br>AUG-NOV | APR-MAY<br>AUG-NOV | APR-MAY<br>AUG-NOV | JAN-DEC | JAN-DEC |
| | Redear sunfish | | | | X | X | X | X | X | X | X | X | X | X | X | X | FEB-AUG | FEB-AUG | FEB-AUG | JAN-DEC | JAN-DEC |
| | Snook | | | | X | X | X | X | X | X | X | X | X | X | X | X | APR-FEB | APR-FEB | JAN-DEC | JAN-DEC | JAN-DEC |
| | Tarpon | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | MAY-DEC | JAN-DEC | JAN-DEC |
| | Tilapia | | | | X | X | X | X | X | X | X | X | X | X | X | X | DEC-JUL | DEC-JUL | DEC-JUL | JAN-DEC | JAN-DEC |
| 77 | Native streax fish | | | | | | | X | X | | | X | X | X | X | | - | - | APR-MAY<br>AUG-NOV | - | - |
| | Nursery fish | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | - | JAN-DEC | - |
| | Snook | | | | X | X | X | X | X | X | X | X | X | X | X | X | APR-FEB | APR-FEB | JAN-DEC | JAN-DEC | JAN-DEC |
| | Tarpon | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | MAY-DEC | JAN-DEC | JAN-DEC |

### PLANT:

| RAR# | Species | S/F | T/E | Conc. | J | F | M | A | M | J | J | A | S | O | N | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72 | Ottoschulzia rhodoxylon | S/F | E/E | | X | X | X | X | X | X | X | X | X | X | X | X |
| 74 | Spiny naiad | | | | X | X | X | X | X | X | X | X | X | X | X | X |
| 79 | Pterocarpus swamp | | | | X | X | X | X | X | X | X | X | X | X | X | X |
| 80 | Schoepfia arenaria | S/F | T/I | | X | X | X | X | X | X | X | X | X | X | X | X |
| 81 | Chamaecrista glandulosa mirabilis | S/F | E/E | | X | X | X | X | X | X | X | X | X | X | X | X |

### INVERTEBRATE:

| RAR# | Species | S/F | T/E | Conc. | J | F | M | A | M | J | J | A | S | O | N | D | Spawning | Eggs | Larvae | Juveniles | Adults |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | Freshwater crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | APR-MAY<br>AUG-NOV | APR-MAY<br>AUG-NOV | - | JAN-DEC | JAN-DEC |
| | Native streax shrimp | | | | X | X | X | X | X | X | X | X | X | X | X | X | APR-MAY<br>AUG-NOV | APR-MAY<br>AUG-NOV | APR-MAY<br>AUG-NOV | JAN-DEC | JAN-DEC |
| 30 | Blue land crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | JUL-AUG | JUL-AUG | JUL-SEP | JAN-DEC | JAN-DEC |
| 35 | Caribbean spiny lobster | | | | X | X | X | X | X | X | X | X | X | X | X | X | JAN-DEC | JAN-DEC | JAN-DEC | JAN-DEC | JAN-DEC |
| | Octopus | | | | X | X | X | X | X | X | X | X | X | X | X | X | DEC-MAR | DEC-APR | - | JAN-DEC | JAN-DEC |
| 62 | Blue crabs | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | - | JAN-DEC | JAN-DEC |
| | Blue land crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | JUL-AUG | JUL-AUG | JUL-SEP | JAN-DEC | JAN-DEC |
| | Native streax shrimp | | | | | | | X | X | | | X | X | X | X | | - | - | APR-MAY<br>AUG-NOV | - | - |
| 74 | Blackback land crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | - | JAN-DEC | JAN-DEC |
| | Blue land crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | JUL-AUG | JUL-AUG | JUL-SEP | JAN-DEC | JAN-DEC |
| | Purple land crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | - | JAN-DEC | JAN-DEC |
| 75 | Blackback land crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | - | JAN-DEC | JAN-DEC |
| | Blue land crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | JUL-AUG | JUL-AUG | JUL-SEP | JAN-DEC | JAN-DEC |
| | Purple land crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | - | JAN-DEC | JAN-DEC |
| 77 | Blackback land crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | - | JAN-DEC | JAN-DEC |
| | Blue land crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | JUL-AUG | JUL-AUG | JUL-SEP | JAN-DEC | JAN-DEC |
| | Native streax shrimp | | | | | | | X | X | | | X | X | X | X | | - | - | APR-MAY<br>AUG-NOV | - | - |
| | Purple land crab | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | - | JAN-DEC | JAN-DEC |
| | Swamp ghost crab (zambucco) | | | VERY HIGH | X | X | X | X | X | X | X | X | X | X | X | X | - | - | - | JAN-DEC | JAN-DEC |

### MARINE MAMMAL:

| RAR# | Species | S/F | T/E | Conc. | J | F | M | A | M | J | J | A | S | O | N | D | Mating | Calving |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Dolphins | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - |
| | Whales | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - |
| 20 | Sperm whale | S/F | E/E | HIGH | X | X | X | X | X | X | X | | X | X | X | X | - | - |
| 35 | Dolphins | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - |
| | Whales | | | | X | X | X | X | X | X | X | X | X | X | X | X | - | - |
| 36 | Humpback whale | S/F | E/E | VERY HIGH | X | X | X | X | X | | | | | | X | X | - | - |

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## BIOLOGICAL RESOURCES: cont.

### REPTILE:

| RAR# | Species | S/F | T/E | Conc. | J | F | M | A | M | J | J | A | S | O | N | D | Nesting | Hatching | Internesting | Juveniles | Adults |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | Green sea turtle | S/F | E/T | | X | X | X | X | X | X | X | X | X | X | X | X | JAN-DEC | JAN-DEC | - | JAN-DEC | JAN-DEC |
| | Hawksbill sea turtle | S/F | E/E | | X | X | X | X | X | X | X | X | X | X | X | X | JAN-DEC | JAN-DEC | - | JAN-DEC | JAN-DEC |
| | Leatherback sea turtle | S/F | E/E | | | X | X | X | X | X | X | X | X | | | | FEB-JUN | APR-SEP | - | APR-SEP | FEB-JUN |
| 62 | Jicotea | | | | X | X | X | X | X | X | X | X | X | X | X | X | APR-JUL | JUN-OCT | - | JAN-DEC | JAN-DEC |
| 74 | Jicotea | | | | X | X | X | X | X | X | X | X | X | X | X | X | APR-JUL | JUN-OCT | - | JAN-DEC | JAN-DEC |
| 80 | Puerto Rican boa | S/F | E/E | | X | X | X | X | X | X | X | X | X | X | X | X | - | - | - | JAN-DEC | JAN-DEC |

## HUMAN USE RESOURCES:

### WATER INTAKE:

| HUN# | Name | Owner/Manager | Contact | Phone |
|---|---|---|---|---|
| 300 | VEGA BAJA FILTER PLANT | PRASA | PR 674, KM 1.0 | 787/858-2010 |

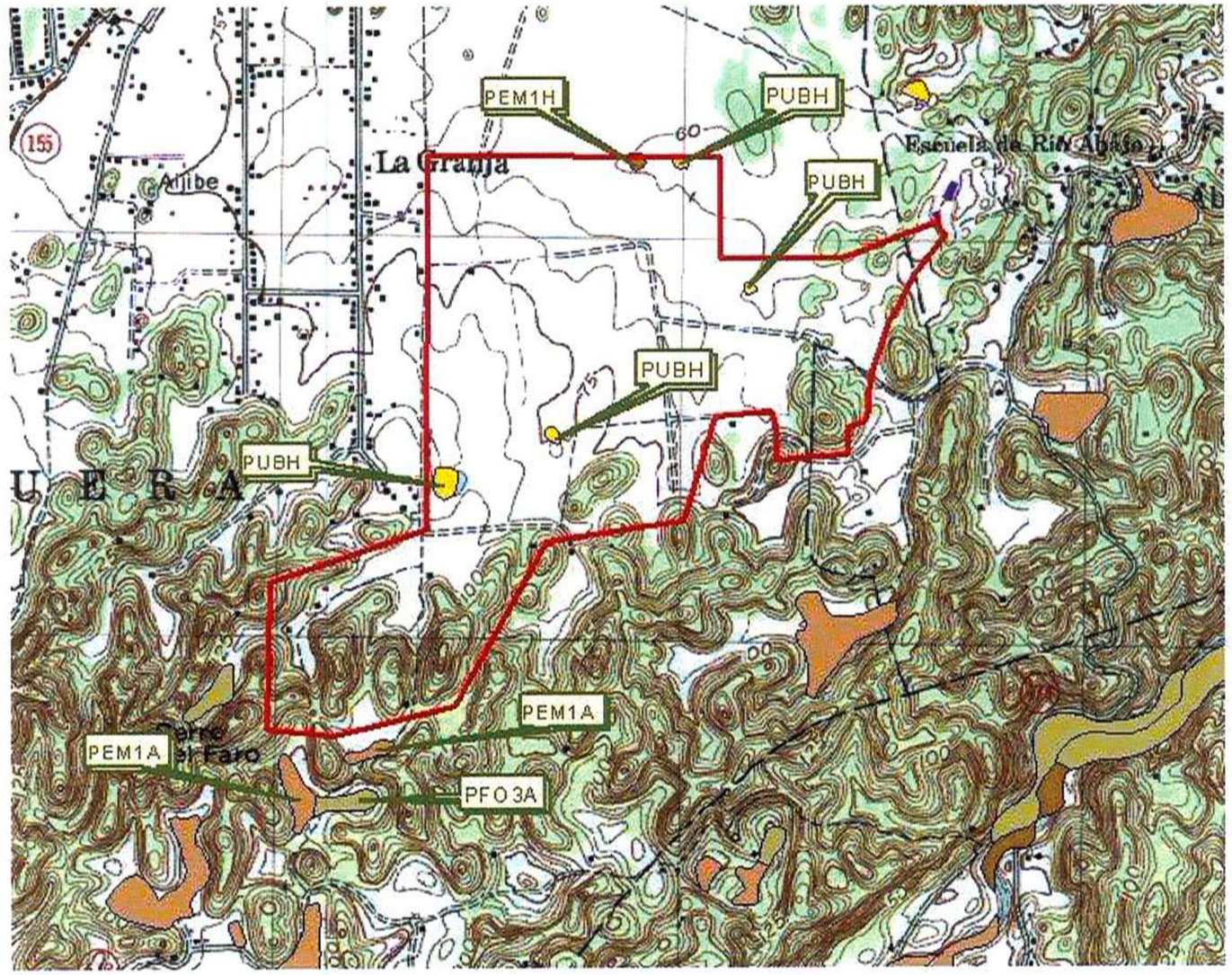
### WILDLIFE REFUGE:

| HUN# | Name | Owner/Manager | Contact | Phone |
|---|---|---|---|---|
| 334 | RESERVA NATURAL HACIENDA LA ESPERANZA | DRNA/PRCT | DIVISION DE RESERVAS NATURALES Y REFUGIOS DE VIDA SILVESTRE | 787/724-2816 |
| 338 | RESERVA NATURAL LAGUNA TORTUGUERO | DRNA | DIVISION DE RESERVAS NATURALES Y REFUGIOS DE VIDA SILVESTRE | 787/724-2816 |
| 339 | RESERVA NATURAL PANTANO CIBUCO | DRNA | DIVISION DE RESERVAS NATURALES Y REFUGIOS DE VIDA SILVESTRE | 787/724-2816 |

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

## Anejo 7. Humedales

Desarrollo Residencial La Sabana
Carr. PR-155
Bo. Pugnado Afuera
Vega Baja, Puerto Rico




Leyenda:

Límite del proyecto

Distancia medida desde límite de la propiedad:

PEM1H- en el segmento Norte del predio

PUBH- en el centro y límite occidental del predio

PEM1A- 56 metros al Sur del predio

PFO3A- 154 metros al Sur

PEM1A- 64 metros al Sur

GOLDEN ENVIRONMENTAL CORPORATION

# Humedales

0 500 Meters

Escala 1:15,000
USFWS
NWI

N

## Anejo 8. Ubicación de Sumideros

Desarrollo Residencial La Sabana
Carr. PR-155
Bo. Pugnado Afuera
Vega Baja, Puerto Rico

Leyenda:

- Límite del proyecto
- Ubicación de sumideros

GOLDEN ENVIRONMENTAL CORPORATION

Ubicación de Sumideros dentro de la Propiedad

Google Earth
2004
Not to scale

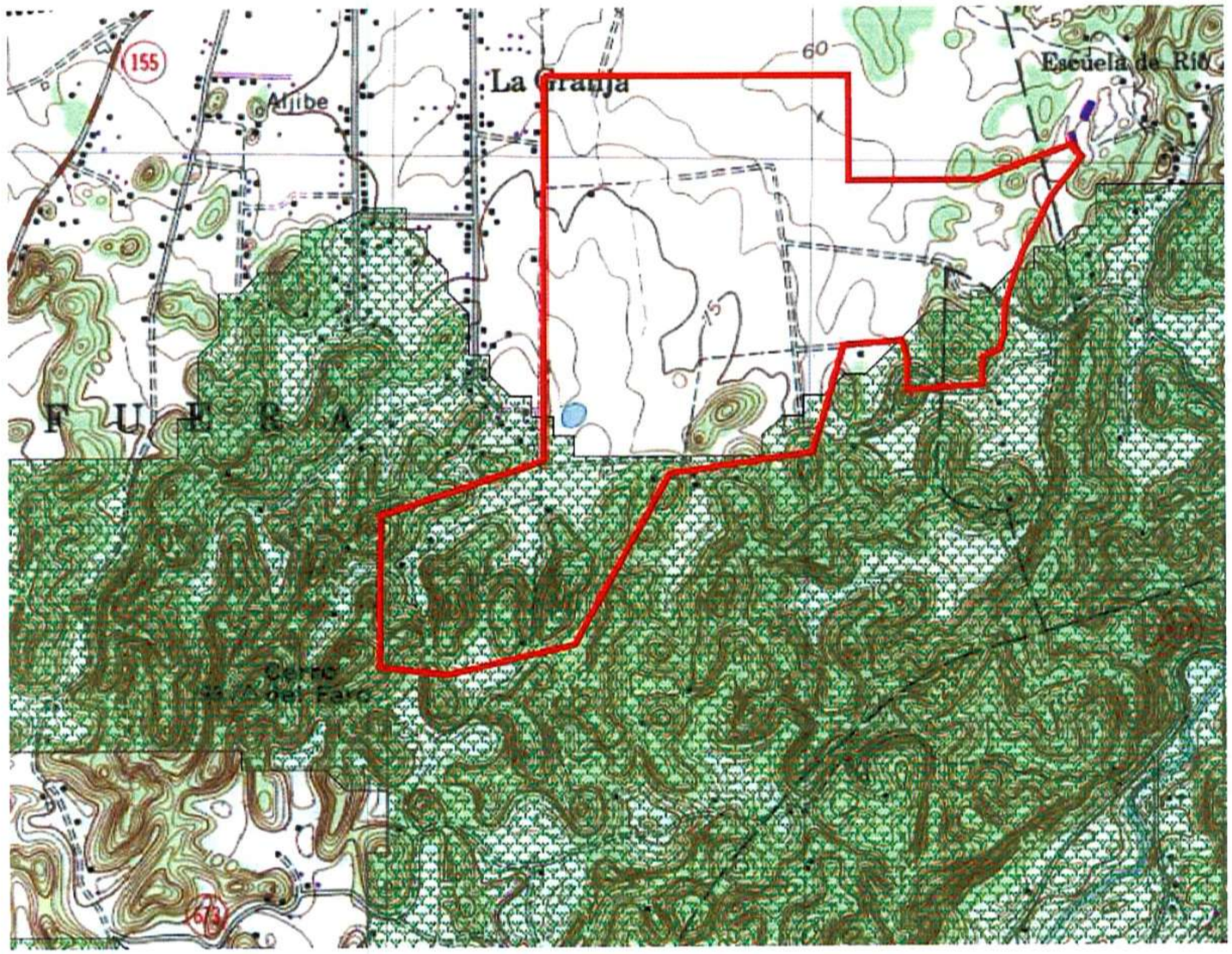
N

## Anejo 9. Zona de Conservación del Carso

Desarrollo Residencial La Sabana
Carr. PR-155
Bo. Pugnado Afuera
Vega Baja, Puerto Rico

Leyenda:

- Límite del proyecto
- Área de conservación del Carso




GOLDEN ENVIRONMENTAL CORPORATION

Zona de Conservación del Carso

200 0 200 400 Meters

Escala 1:10,000
DRNA
Revisado 2006

N

## Anejo 10. Ubicación del punto de muestreo de las grabaciones

Desarrollo Residencial La Sabana
Carr. PR-155
Bo. Pugnado Afuera
Vega Baja, Puerto Rico

Leyenda:

Límite del proyecto

Punto de muestreo

GOLDEN ENVIRONMENTAL CORPORATION

Ubicación del punto de muestreo de las grabaciones

200 0 200 400 Meters

USGS 2004
Seamless Data Distribution
Escala 1:9,000

N

## Anejo 11. Fotos Representativas

# Anejo 12. Protocolo de Protección de la Boa de Puerto Rico

# PROTOCOLO DE PROTECCION DE LA BOA DE PUERTO RICO A SEGUIR DURANTE ACTIVIDADES DE IMPACTO

1. Toda persona a trabajar en el proyecto de construcción debe participar, con antelación al comienzo de las labores, de una charla educativa sobre la Boa Puertorriqueña, ***Epicrates inornatus***, a ofrecerse por el personal del Departamento de Recursos Naturales y Ambientales. Esta deberá proveer la siguiente información:

   a) Datos generales sobre la especie, ilustrados con fotos y diapositivas (i.e. característica de su hábitat, ausencia de veneno, mito sobre el poder curativo de sus aceite, identificación, beneficio de la especie a la sociedad y al ecosistema, leyes y reglamentos que la protegen y las penalidades que conlleva intervenir con ellas, ya sea para hacerles daño o capturarlas para venderlas).

   b) Literatura con fotos de la serpiente.

   c) Procedimientos a seguir al encontrar un espécimen de serpiente, tanto de forma oral como escrita.

   d) Lista de personas u oficinas a llamar en caso de encontrar una serpiente (boas u otras especies) de manera que esta pueda ser identificada y si resultara ser una boa, relocalizarla a las áreas de mogotes adyacente. En un plazo no mayor de 24 horas a partir del momento del hallazgo.

   e) Identificar las personas encargadas de reportar el hallazgo de serpientes en el área.

f) Todo personal que sea contratado por el proponente, con posterioridad al ofrecimiento de esta charla, deberá contactar al DRNA para que se le provea una charla con el mismo contenido de información.

2. Los procedimientos a seguir en caso de encontrar una serpiente en el área del proyecto al estar durante las labores de extracción serán los siguientes:

a) Los trabajadores en un radio de no menos de 50 pies alrededor de la serpiente detendrán su labor y apagaran la maquinaria.

b) Una persona mantendrá la serpiente bajo observación en tanto otra se comunica con la persona encargada de reportar el hallazgo a las agencias o personas en lista (el período de observación solo se mantendrá durante las horas laborables de los empleados del proyecto).

c) El observador deberá mantener una distancia no menor de 25 pies, mayor de ser posible, con la serpiente de manera que esta se percate lo menos posible de su presencia y no se oculte. La serpiente deberá mantenerse bajo observación hasta que el personal técnico encargado de su relocalización arribe al área.

d) El encargado se comunicará o designara a alguien que se comunique por teléfono con alguna de las agencias o personas en la lista.

# Anejo 13. Rapid Assessment of Species Using an Automated Digital Recording System

# TECHNICAL REPORT FOR GOLDEN ENVIRONMENTAL CORPORATION RAPID ASSESSMENT OF SPECIES USING AN AUTOMATED DIGITAL RECORDING SYSTEM

Project: Desarrollo Residencial La Sabana

Luis J. Villanueva-Rivera, M.S.
400 Calle Calaf
PMB 20
San Juan, PR 00918
June 20, 2007

## Methods

An Automated Digital Recording Systems (ADRS; Acevedo & Villanueva-Rivera 2006) was placed by Golden Environmental at the study site. The ADRS consisted of a Gumstix Connex 200 computer with an audio card. The computer stored the recordings in a CompactFlash memory card. The computer was controlled with a custom controller. To be able to record faint sounds, a portable preamp was used (The Sound Professionals SP-PREAMP) with an electrec condenser microphone (Sony ECM-MS908C).

The system recorded the sounds in 16-bit wav files with a sampling rate of 44.1 kHz. A total of 10 samples per day were collected, 6 recordings of 1 minute were made every 30 minutes between 18:30 and 21:00 and 4 samples of 5 minutes each at dawn, between 6:00 and 7:30. Each recording was coded with the date and time. The sampling took place between May 26 and May 30, 2007.

Analysis – The files were analyzed using Adobe Audition 2.0. Each sound was identified by species for amphibians and birds, with the exception of roosters. Images of sound spectrums were made using Raven Lite 1.0.

Each recording was heard with headphones while looking at the sound spectrum to identify the sounds present. A database and files amphibian recordings (Villanueva-Rivera 2006) and published recordings for the amphibians (Rivero 1998) and birds (Oberle 2000) of Puerto Rico were available to determine the species identity of each sound.

## Results

The system recorded sound samples for five days. During this time, four amphibian species were detected (Appendix 1):

- Common Coquí (*Eleutherodactylus coqui*)
- Coquí Churí (*Eleutherodactylus antillensis*)
- Whistling Coquí (*Eleutherodactylus cochranae*)
- White-lipped Frog (*Leptodactylus albilabris*)

A total of 16 species of birds were identified in the recordings (Appendix 1). These were:

- Adelaide's Warbler (*Dendroica adelaidae*)
- Bananaquit (*Coereba flaveola*)
- Black-whiskered Vireo (*Vireo altiloquus*)
- Common Ground Dove (*Columbina passerina*)
- Greater Antillean Grackle (*Quiscalus niger*)
- Gray Kingbird (*Tyrannus dominicensis*)
- Grasshopper Sparrow (*Ammodramus savannarum*)
- Mangrove Cuckoo (*Coccyzus minor*)
- Northern Mockingbird (*Mimus polyglottos*)
- Puerto Rican Bullfinch (*Loxigilla portoricensis*)
- Puerto Rican Flycatcher (*Myiarchus antillarum*)
- Puerto Rican Lizard-Cuckoo (*Coccyzus vieilloti*)
- Puerto Rican Vireo (*Vireo latimeri*)
- Red Junglefowl (*Gallus gallus*)
- Smooth-billed Ani (*Crotophaga ani*)
- Zenaida Dove (*Zenaida aurita*)

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Appendix 1.

| | 05/26/07 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 06:00:00 | 06:30:00 | 07:00:00 | 07:30:00 | 18:30:00 | 19:00:00 | 19:30:00 | 20:00:00 | 20:30:00 | 21:00:00 | 06:00:00 |
| Common Coquí *(Eleutherodactylus coqui)* | | | | | X | X | X | X | X | X | |
| Coquí Churí *(Eleutherodactylus antillensis)* | | | | | X | X | X | X | X | X | |
| Whistling Coquí *(Eleutherodactylus cochranae)* | | | | | X | X | X | X | X | X | |
| White-lipped Frog *(Leptodactylus albilabris)* | | | | | | | | | | | |
| Adelaide's Warbler (*Dendroica adelaidae* ) | | | | | X | | | | | | X |
| Bananaquit (*Coereba flaveola* ) | | | | | X | | | | | | X |
| Black-whiskered Vireo (*Vireo altiloquus* ) | | | | | | | | | | | X |
| Common Ground Dove (*Columbina passerina* ) | | | | | | | | | | | X |
| Greater Antillean Grackle (*Quiscalus niger* ) | | | | | | | | | | | |
| Gray Kingbird (*Tyrannus dominicensis* ) | | | | | | | | | | | X |
| Grasshopper Sparrow (*Ammodramus savannarum* ) | | | | | | | | | | | |
| Mangrove Cuckoo (*Coccyzus minor* ) | | | | | | | | | | | X |
| Northern Mockingbird | | | | | | | | | | | |

Appendix 1.

05/26/07

| | 06:00:00 | 06:30:00 | 07:00:00 | 07:30:00 | 18:30:00 | 19:00:00 | 19:30:00 | 20:00:00 | 20:30:00 | 21:00:00 | 06:00:00 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (*Mimus polyglottos* ) | | | | | | | | | | | |
| Puerto Rican Bullfinch (LoXigilla portoricensis) | | | | | | | | | | | |
| Puerto Rican Flycatcher (*Myiarchus antillarum* ) | | | | | | | | | | | |
| Puerto Rican Lizard-Cuckoo (*Coccyzus vieilloti* ) | | | | | | | | | | | |
| Puerto Rican Vireo (*Vireo latimeri* ) | | | | | | | | | | | |
| Red Junglefowl (*Gallus gallus* ) | | | | | | | | | | | X |
| Smooth-billed Ani (*Crotophaga ani* ) | | | | | | | | | | | |
| Zenaida Dove (*Zenaida aurita* ) | | | | | | | | | | | X |

Appendix 1.

| | 05/27/07 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 06:30:00 | 07:00:00 | 07:30:00 | 18:30:00 | 19:00:00 | 19:30:00 | 20:00:00 | 20:30:00 | 21:00:00 | 06:00:00 | 06:30:00 |
| Common Coquí *(Eleutherodactylus coqui)* | | | | X | X | X | X | X | | | |
| Coquí Churí *(Eleutherodactylus antillensis)* | | | | X | X | X | X | X | | | |
| Whistling Coquí *(Eleutherodactylus cochranae)* | | | | X | X | X | X | X | | | |
| White-lipped Frog *(Leptodactylus albilabris)* | | | | X | | | | | | | |
| Adelaide's Warbler (*Dendroica adelaidae* ) | X | | | | | | | | | | X |
| Bananaquit (*Coereba flaveola* ) | X | X | X | | | | | | | X | X |
| Black-whiskered Vireo (*Vireo altiloquus* ) | X | | X | | | | | | | | X |
| Common Ground Dove (*Columbina passerina* ) | X | | | | | | | | | | |
| Greater Antillean Grackle (*Quiscalus niger* ) | | X | | | | | | | | | X |
| Gray Kingbird (*Tyrannus dominicensis* ) | X | X | X | X | | | | | | X | X |
| Grasshopper Sparrow (*Ammodramus savannarum* ) | | | | | | | | | | | |
| Mangrove Cuckoo (*Coccyzus minor* ) | X | X | X | X | | | | | | | X |
| Northern Mockingbird | X | X | X | | | | | | | X | X |

Appendix 1.

| | 05/27/07 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 06:30:00 | 07:00:00 | 07:30:00 | 18:30:00 | 19:00:00 | 19:30:00 | 20:00:00 | 20:30:00 | 21:00:00 | 06:00:00 | 06:30:00 |
| (*Mimus polyglottos* ) | | | | | | | | | | | |
| Puerto Rican Bullfinch (LoXigilla portoricensis) | | | X | X | | | | | | | |
| Puerto Rican Flycatcher (*Myiarchus antillarum* ) | | X | X | | | | | | | | |
| Puerto Rican Lizard-Cuckoo (*Coccyzus vieilloti* ) | | X | | | | | | | | | |
| Puerto Rican Vireo (*Vireo latimeri* ) | | | X | | | | | | | | |
| Red Junglefowl (*Gallus gallus* ) | | | X | | | | | | | X | X |
| Smooth-billed Ani (*Crotophaga ani* ) | X | X | | | | | | | | | |
| Zenaida Dove (*Zenaida aurita* ) | X | X | X | | | | | | | | |

Appendix 1.

| | 05/28/07 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 07:00:00 | 07:30:00 | 18:30:00 | 19:00:00 | 19:30:00 | 20:00:00 | 20:30:00 | 21:00:00 | 06:00:00 | 06:30:00 | 07:00:00 |
| Common Coquí *(Eleutherodactylus coqui)* | | | X | X | X | X | X | | | | |
| Coquí Churí *(Eleutherodactylus antillensis)* | | | X | X | X | X | X | | | | |
| Whistling Coquí *(Eleutherodactylus cochranae)* | | | X | X | X | X | X | | | | |
| White-lipped Frog *(Leptodactylus albilabris)* | | | | | | | | | | | |
| Adelaide's Warbler (*Dendroica adelaidae* ) | X | X | | | | | | | | X | |
| Bananaquit (*Coereba flaveola* ) | X | X | X | | | | | | X | X | X |
| Black-whiskered Vireo (*Vireo altiloquus* ) | X | X | | | | | | | | X | X |
| Common Ground Dove (*Columbina passerina* ) | | | | | | | | | | | |
| Greater Antillean Grackle (*Quiscalus niger* ) | X | | | | | | | | | | X |
| Gray Kingbird (*Tyrannus dominicensis* ) | X | | | | | | | | X | X | X |
| Grasshopper Sparrow (*Ammodramus savannarum* ) | | | | | | | | | | | |
| Mangrove Cuckoo (*Coccyzus minor* ) | X | X | | | | | | | | | |
| Northern Mockingbird | X | X | | | | | | | | X | X |

Appendix 1.

| | 05/28/07 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 07:00:00 | 07:30:00 | 18:30:00 | 19:00:00 | 19:30:00 | 20:00:00 | 20:30:00 | 21:00:00 | 06:00:00 | 06:30:00 | 07:00:00 |
| (*Mimus polyglottos* ) | | | | | | | | | | | |
| Puerto Rican Bullfinch (LoXigilla portoricensis) | | | | | | | | | X | X | X |
| Puerto Rican Flycatcher (*Myiarchus antillarum* ) | | | | | | | | | | | X |
| Puerto Rican Lizard-Cuckoo (*Coccyzus vieilloti* ) | X | | | | | | | | | | |
| Puerto Rican Vireo (*Vireo latimeri* ) | | | | | | | | | | | |
| Red Junglefowl (*Gallus gallus* ) | | | | | | | | | | | |
| Smooth-billed Ani (*Crotophaga ani* ) | X | X | | | | | | | | | |
| Zenaida Dove (*Zenaida aurita* ) | | X | | | | | | | | | |

Appendix 1.

| | 05/29/07 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 07:30:00 | 18:30:00 | 19:00:00 | 19:30:00 | 20:00:00 | 20:30:00 | 21:00:00 | 06:00:00 | 06:30:00 | 07:00:00 | 07:30:00 |
| Common Coquí *(Eleutherodactylus coqui)* | | X | X | X | X | X | | | | | |
| Coquí Churí *(Eleutherodactylus antillensis)* | | X | X | X | X | X | | | | | |
| Whistling Coquí *(Eleutherodactylus cochranae)* | | X | X | X | X | X | | | | | |
| White-lipped Frog *(Leptodactylus albilabris)* | | | | | | | | | | | |
| Adelaide's Warbler (*Dendroica adelaidae* ) | | | | | | | | | X | | |
| Bananaquit (*Coereba flaveola* ) | X | | | | | | | X | X | X | X |
| Black-whiskered Vireo (*Vireo altiloquus* ) | X | | | | | | | X | X | X | X |
| Common Ground Dove (*Columbina passerina* ) | | | | | | | | | | | |
| Greater Antillean Grackle (*Quiscalus niger* ) | X | | | | | | | | X | | |
| Gray Kingbird (*Tyrannus dominicensis* ) | X | | | | | | | | X | X | X |
| Grasshopper Sparrow (*Ammodramus savannarum* ) | | | | | | | | | | | |
| Mangrove Cuckoo (*Coccyzus minor* ) | X | | | | | | | | X | X | |
| Northern Mockingbird | X | | | | | | | | X | X | X |

Appendix 1.

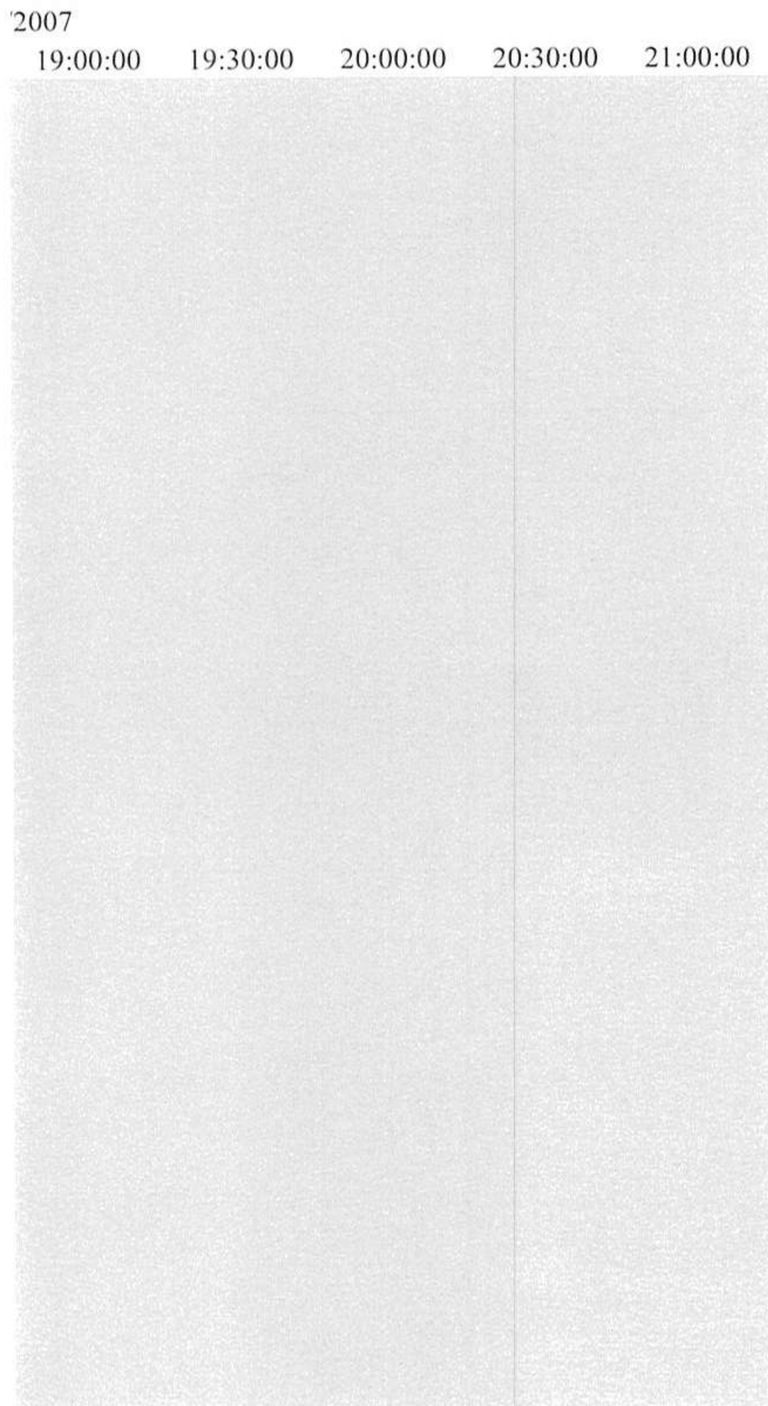
| | 05/29/07 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 07:30:00 | 18:30:00 | 19:00:00 | 19:30:00 | 20:00:00 | 20:30:00 | 21:00:00 | 06:00:00 | 06:30:00 | 07:00:00 | 07:30:00 |
| (*Mimus polyglottos* ) | | | | | | | | | | | |
| Puerto Rican Bullfinch (LoXigilla portoricensis) | | | | | | | | | X | | |
| Puerto Rican Flycatcher (*Myiarchus antillarum* ) | | | | | | | | | | | |
| Puerto Rican Lizard-Cuckoo (*Coccyzus vieilloti* ) | | | | | | | | | | X | X |
| Puerto Rican Vireo (*Vireo latimeri* ) | | | | | | | | | | | |
| Red Junglefowl (*Gallus gallus* ) | | | | | | | | X | | | |
| Smooth-billed Ani (*Crotophaga ani* ) | | | | | | | | | | | |
| Zenaida Dove (*Zenaida aurita* ) | | | | | | | | | | X | X |

| Appendix 1. | 05/30/07 | | | | | | | | | | 5/31/ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 18:30:00 | 19:00:00 | 19:30:00 | 20:00:00 | 20:30:00 | 21:00:00 | 06:00:00 | 06:30:00 | 07:00:00 | 07:30:00 | 18:30:00 |
| Common Coquí *(Eleutherodactylus coqui)* | X | X | X | X | | | | | | | |
| Coquí Churí *(Eleutherodactylus antillensis)* | X | X | X | X | | | | | | | |
| Whistling Coquí *(Eleutherodactylus cochranae)* | X | X | X | X | | | | | | | |
| White-lipped Frog *(Leptodactylus albilabris)* | | | | | | | | | | | |
| Adelaide's Warbler (*Dendroica adelaidae* ) | | | | | | | | | X | | |
| Bananaquit (*Coereba flaveola* ) | | | | | | | X | X | X | | |
| Black-whiskered Vireo (*Vireo altiloquus* ) | | | | | | | X | | X | | |
| Common Ground Dove (*Columbina passerina* ) | | | | | | | | | | | |
| Greater Antillean Grackle (*Quiscalus niger* ) | | | | | | | | | | | |
| Gray Kingbird (*Tyrannus dominicensis* ) | | | | | | | | | | | |
| Grasshopper Sparrow (*Ammodramus savannarum* ) | | | | | | | | | X | | |
| Mangrove Cuckoo (*Coccyzus minor* ) | | | | | | | X | | X | X | |
| Northern Mockingbird | | | | | | | | X | X | X | |

Appendix 1.

| | 05/30/07 | | | | | | | | | | 5/31/ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 18:30:00 | 19:00:00 | 19:30:00 | 20:00:00 | 20:30:00 | 21:00:00 | 06:00:00 | 06:30:00 | 07:00:00 | 07:30:00 | 18:30:00 |
| (*Mimus polyglottos* ) | | | | | | | | | | | |
| Puerto Rican Bullfinch (LoXigilla portoricensis) | | | | | | | | | | | |
| Puerto Rican Flycatcher (*Myiarchus antillarum* ) | | | | | | | | | | | |
| Puerto Rican Lizard-Cuckoo (*Coccyzus vieilloti* ) | | | | | | | | | | | |
| Puerto Rican Vireo (*Vireo latimeri* ) | | | | | | | | | | | |
| Red Junglefowl (*Gallus gallus* ) | | | | | | | | | | | |
| Smooth-billed Ani (*Crotophaga ani* ) | | | | | | | | | | | |
| Zenaida Dove (*Zenaida aurita* ) | | | | | | | | | | | |

Appendix 1.




Common Coquí
*(Eleutherodactylus coqui)*

Coquí Churí
*(Eleutherodactylus antillensis)*

Whistling Coquí
*(Eleutherodactylus cochranae)*

White-lipped Frog
*(Leptodactylus albilabris)*

Adelaide's Warbler
(*Dendroica adelaidae* )

Bananaquit
(*Coereba flaveola* )

Black-whiskered Vireo
(*Vireo altiloquus* )

Common Ground Dove
(*Columbina passerina* )

Greater Antillean Grackle
(*Quiscalus niger* )

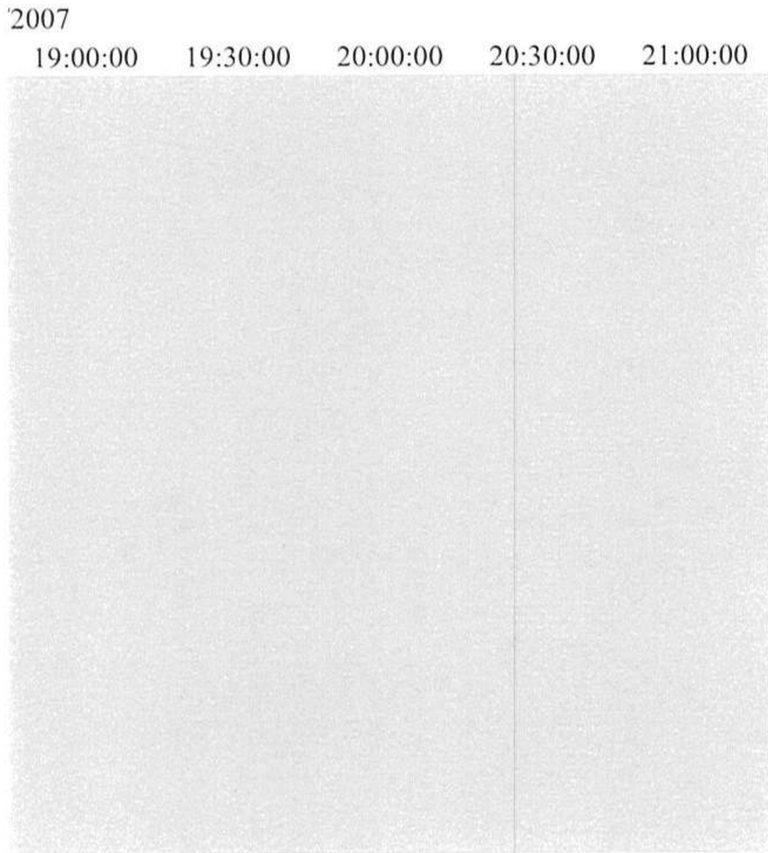
Gray Kingbird
(*Tyrannus dominicensis* )

Grasshopper Sparrow
(*Ammodramus savannarum* )

Mangrove Cuckoo
(*Coccyzus minor* )

Northern Mockingbird

Appendix 1.




(*Mimus polyglottos* )

Puerto Rican Bullfinch
(LoXigilla portoricensis)

Puerto Rican Flycatcher
(*Myiarchus antillarum* )

Puerto Rican Lizard-Cuckoo
(*Coccyzus vieilloti* )

Puerto Rican Vireo
(*Vireo latimeri* )

Red Junglefowl
(*Gallus gallus* )

Smooth-billed Ani
(*Crotophaga ani* )

Zenaida Dove
(*Zenaida aurita* )