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**U.S. Fish and Wildlife Service-Endangered Species Act Emergency Section 7 Consultation
Best Management Practices (BMPs) for Federally Listed Species in Relation to Emergency
Works on Various Roadways in Puerto Rico due to Hurricanes Irma and Maria**

Thank you for letter dated September 25, 2017, regarding the emergency work on various roadways in Puerto Rico due to Hurricanes Irma and Maria (Project # AC-800535/800356). According to the information provided by the Puerto Rico Highway and Transportation Authority (PRHTA), the proposed activities consist of roadway rehabilitation, guardrail reinstallation, traffic sign reinstallation, traffic control systems reinstallation, pavement marking, reconstruction of sidewalks, storm sewers repairs, landslide correction, bridge repairs, installation of temporary bridges, replacement of bridges, bridge scouring repairs, bank stabilization; and the construction of rubble concrete walls, concrete curb and gutters, prefabricated drainage composite, and concrete paved waterways, among other miscellaneous work.

The proposed actions are within or close to roads that were damaged by the two hurricanes. Thus, we would expect few encounters, if any, with federally listed species. Specifically, we have no concerns relative to impacts to listed species for activities related to roadway rehabilitation, guardrail and traffic sign reinstallation, traffic control system reinstallation, reconstruction of sidewalks, or pavement marking. All these activities will be in structures already in place and no listed species are associated to them.

With respect to storm sewer repairs, bridge repairs, bridge replacements, installation of temporary bridges, and bridge scouring repairs, no listed species are likely to be impacted as long as the work is conducted within the footprint of the existing structures. Regarding landslides corrections and bank stabilizations, these activities imply some habitat modification that could directly or indirectly impact listed species.

Here we provide a number of conservation measures to avoid and minimize harm to the following listed species that could be encountered in some of the sites included in the list of projects submitted by PRHTA:

Animals:

Puerto Rican boa (*Epicrates inornatus*), Virgin Islands tree boa (*Epicrates monensis granti*), Coquí guajón (*Eleutherodactylus cooki*), Puerto Rican parrot (*Amazona vittata vittata*), Puerto Rican sharp-shinned hawk (*Accipiter striatus venator*), Puerto Rican broad-winged hawk (*Buteo platypterus brunnescens*), Puerto Rican plain pigeon (*Patagioenas inornata wetmorei*), Elfin-woods warbler (*Setophaga angelae*), Leatherback sea turtle (*Dermochelys coraicea*), Hawksbill sea turtle (*Eretmochelys imbricate*), and Green sea turtle (*Chelonia mydas*).

Plants:

Palo de Ramón (*Banara vanderbiltii*), *Cordia bellonis* (no common name), Higüero de Sierra (*Crescentia portoricensis*), Cobana Negra (*Stahlia monsperma*), Beautiful goetzea (Matabuey; *Goetzea elegans*)

A. Snakes:

- Both the PR boa and the VI boa may be encountered while conducting the proposed activities because they are known to use debris piles for shelter and for finding food. Both species are more active at night and are also known to seek shelter within vehicles, heavy machinery compartments (e.g., engine), housing and buildings, and used tires.
- The PR boa and the VI boa are non-venomous snakes and pose no life threatening danger to human beings. Although they are considered generally docile, some individuals might try to bite if disturbed or during capture and handling. Due to the habitat destruction caused by the hurricanes, these snakes might be moving more frequently and traveling longer distances in search for food and shelter.
- The PR boa has a widespread distribution across Puerto Rico and may also be found in the Island of Vieques.
- The VI boa has a more limited distribution in northeast Puerto Rico, with a known range that includes the municipalities of Ceiba, Fajardo, Humacao, Luquillo, Río Grande, and Culebra Island.
- We recommend the implementation of the following conservation measures to avoid or minimize detrimental effects from the proposed activities on these two species:
 - i. Inform all personnel about the potential presence of the PR boa and the VI boa in some of the areas where the proposed work will be conducted.
 - ii. Make personnel with expertise on the identification and handling of snakes available to respond to sightings and as necessary handle boas found at project sites.
 - iii. Measures should be established to minimize boa casualties by heavy machinery or motor vehicles being used for these activities. Therefore, any heavy machinery left on site outdoor (staging) needs to be thoroughly inspected each morning before works starts to ensure that no boas are sheltered within engine compartments or other areas of the equipment. If boas are found within vehicles or equipment, notify experienced personnel immediately for proper handling and relocation of the animal (see below).
 - iv. Measures should be established to minimize boa casualties that may be sheltering in debris piles as a result of these activities. Prior to moving, disposing or shredding, debris piles should be carefully inspected for the presence of boas.
 - v. If a boa is found alive, work should stop until the animal is moved out of harm. Boas that are found alive should be safely captured and put in cloth bags and securely tied. Cloth bags with boas should be safely stored in a cool place out of direct sunlight and extreme heat until relocation.
 - vi. Live boas should be safely relocated at least 1 km away from the activity site within forested habitat.
 - vii. If a boa is found dead it can be buried in an appropriate site after documentation (see below).
 - viii. For all boa sightings (dead or alive), record the time and date of the sighting, and the specific location where it was found. Records of all boa sightings should be

included in a monthly report and a final report of the project. Live boa data should also include a photo of the animal, relocation site GPS coordinate, and the time and date of the relocation.

- ix. All boa sightings and relocation reports should be sent to the USFWS contact person listed below.

B. Coquí guajón

- This threatened species is only known to occur in the municipalities of Yabucoa, San Lorenzo, Patillas, Humacao, Las Piedras, Juncos, and Maunabo.
- The coquí guajón utilizes large to small caves and holes formed by different sized granite boulders or crevices within rocky streams. The habitat formed by the large granite boulders are commonly known as *guajonales*. The species also has been detected using culverts and adjacent to aqueduct stations. Projects that occur upstream or upland where the species occurs may also impact its habitat further below. As water is a very important component of the species' habitat, any stream, creek, or similar body of water with the habitat characteristics indicated above may harbor the species.
- At least one critical habitat unit has been designated in each of the municipalities listed above, all within private lands. Please review the following document that describes and illustrates all of the 17 designated critical habitats for these species. (<https://www.gpo.gov/fdsys/pkg/FR-2007-10-23/pdf/07-5056.pdf#page=2>). You may also download spatial data for these critical habitats by searching here: <https://ecos.fws.gov/ecp/report/table/critical-habitat.html>. If any of the proposed activities are within any of these 17 critical habitats, avoid adversely affecting these areas to the maximum extent possible.
- If impacts to any of the critical habitat unit are unavoidable, please document with before and after photographs, GPS location and the specific activity that took place.
- If the species is sighted or heard calling please keep a record of the site where it was detected. This frog is more active after nightfall, but is also known to call during the day from within its shelter. You may find more information on this species including a recording of its call here: <http://www.proyectocoqui.org/portfolio/coqui-guajon/#.Wd4govlSzIU>
- If the species is detected in an area that will be impacted by any of the proposed activities, try to relocated all possible individuals to the nearest similar habitat that will not be impacted.

C. Birds:

- Puerto Rican parrot: currently there are two wild populations of PR parrots, one at El Yunque National Forest, and the other at the Río Abajo State Forest.
- Puerto Rican sharp-shinned hawk: presently the geographic distribution of this species appears to be centered along the more central portions of the Cordillera Central of Puerto Rico, with a higher presence within private lands. This area includes the Guilarte, Toro Negro, and Maricao State Forests, Tres Picachos, La Olimpia Forest, and the surrounding private lands of this region. The species also has been reported in the municipalities of San Germán, Orocovis, Adjuntas, Jayuya, Juana Diaz, Utuado, Ponce, and Peñuelas, and in the karst region of the municipalities of Arecibo and Manatí.

- Puerto Rican broad-winged hawk: documented within and outside the boundaries of the Río Abajo State Forest, along the Tanamá River valley, Toro Negro and Guilarte State Forests, and the northern karst region of Puerto Rico. Also, it occurs in eastern Puerto Rico in the Carite State Forest, and El Yunque National Forest.
- Puerto Rican plain pigeon: the PR plain pigeon has been documented in the municipalities of Cidra, Aguas Buenas, Aibonito, Caguas, Cayey, and Comerío in east-central Puerto Rico. Additional sightings of the species have been recently recorded in the municipalities Corozal, Morovis, and Orocovi.
- Elfin-woods warbler: this species is currently found at El Yunque National Forest, and the Maricao State Forest and adjacent private lands.

We do not anticipate adverse effects of the proposed actions on the bird species indicated above because their breeding season is over. However, their habitat most likely was damaged by the hurricane, forcing them to wander around in search for food and shelter. Thus, we recommend that if any of the species is observed perching close to working sites, activities should stop until the birds move away from the area.

D. Sea Turtles:

- Leatherback sea turtle: this species nests in Puerto Rico from February to August, mainly on beaches in the municipalities of Dorado, Barceloneta, Arecibo, Añasco, Mayagüez, Maunabo, Luquillo, Fajardo, Humacao, Yabucoa, Culebra Island, and Vieques Island.
- Hawksbill sea turtle: the nesting season of this species is from May to December, with a nesting peak in Puerto Rico between August and October. Main nesting beaches are in Humacao, Maunabo, Patillas, Vieques Island, and Mona Island.
- Green sea turtle: this species nest in Puerto Rico between June and September, particularly in Vieques Island, but nests also have been found in Humacao, Yabucoa, Maunabo, and Patillas.
- We recommend the implementation of the following conservation measures to avoid or minimize detrimental effects from the proposed activities on these species:
 - i. To the maximum extent possible minimize the removal of vegetation, fence installation, construction activities, and light installation within 50 meters from the high tide.
 - ii. Designate a buffer zone of at least 20 meters to minimize indirect impacts from reconstruction work.
 - iii. We recommend the development of a plan for coastal areas where lights will be repaired or newly installed. Lights should not be seen directly or indirectly from the beach. Strategies such as shielding, lowering the lights, locating the lights away from sight view of the beach, using an alternate light source such as Low Pressure Sodium Vapor lights, red or amber LEDs, and planting of vegetation barriers are some of the available alternatives to reach the lightning plan goal. LEDs should be of the proper wavelength (true red or amber colored diode) and should not consist of white or blue LEDs with filter material.
 - iv. For more information about sea turtle friendly lighting, you may review the following websites:

<http://seaturtlelighting.net>
[http://www.superiorlighting.com/Turtle Friendly Lights s/864.htm](http://www.superiorlighting.com/Turtle_Friendly_Lights_s/864.htm)
<http://www.ledsource.com/blog/leds-provide-turtle-friendly-lighting>

E. Plants:

- Palo de Ramón (*Banara vanderbiltii*): This species has been documented in the haystacks (mogotes) along road PR 2 in La Virgencita Sector, specifically between the intersection of road PR 693 with road PR 2 and the intersection of road PR 142 with road PR 2 in the municipality of Dorado. Individuals of Palo de Ramón have been found close to the edges of the road in this area.
- *Cordia bellonis* (no common name): Occurs along the edges of road PR 120 from Montoso Ward in the municipality of Maircao south to the municipality of Sabana Grande. Potentially found in all forested habitat in the segment of road PR 120 that runs through the Maricao State Forest. *Cordia bellonis* also has been found along the edges of road PR 10 from Cueva Ventana, south to the entrance of the Río Abajo State Forest, and along road PR 621 at El Jobo Ward in the municipality of Arecibo.
- Higüero de Sierra (*Crescentia portoricensis*): Similar to *C. bellonis*, this species occurs along the edges of road PR 120 from Montoso Ward in the municipality of Maircao, south to the municipality of Sabana Grande. Potentially found in all forested habitat in the segment of road PR 120 that runs through the Maricao State Forest.
- Cobana Negra (*Stahlia monspersma*): Several individuals of Cobana Negra have been planted along different roads in southwest Puerto Rico: road PR 101 (in front of the Boquerón Post Office), road PR 116 between the municipalities of Lajas and Guánica, and road PR 102, Minillas Sector in the municipality of San Germán.
- Beautiful goetzea (Matabuey; *Goetzea elegans*): Found at the intersection of road PR 113 with road PR 2, Cara del Indio Sector in the municipality of Isabela.

For the areas indicated above where listed plants may be present, limit operation activities only to removal of fallen trees and dead vegetation to the greatest extent possible and try to avoid impacting additional forested habitat. Although the habitat may have suffered impacts from the hurricane, it, along with the plants found there, is expected to recover. Also, avoid pushing or dumping debris into forested areas along the roads, particularly if using heavy machinery.

If you have any question, please contact José A. Cruz Burgos, Endangered Species Program Coordinator, at 787-510-5206 or jose_cruz-burgos@fws.gov.