



CARIBBEAN ISLANDS NATIONAL WILDLIFE REFUGE COMPLEX



Invasive Eradication/Control and Importance of Biosecurity





CARIBBEAN ISLANDS NATIONAL WILDLIFE REFUGE COMPLEX



- Important Resources on Islands
- Threats from Invasive Species on Islands
- Control/Eradication
- Biosecurity



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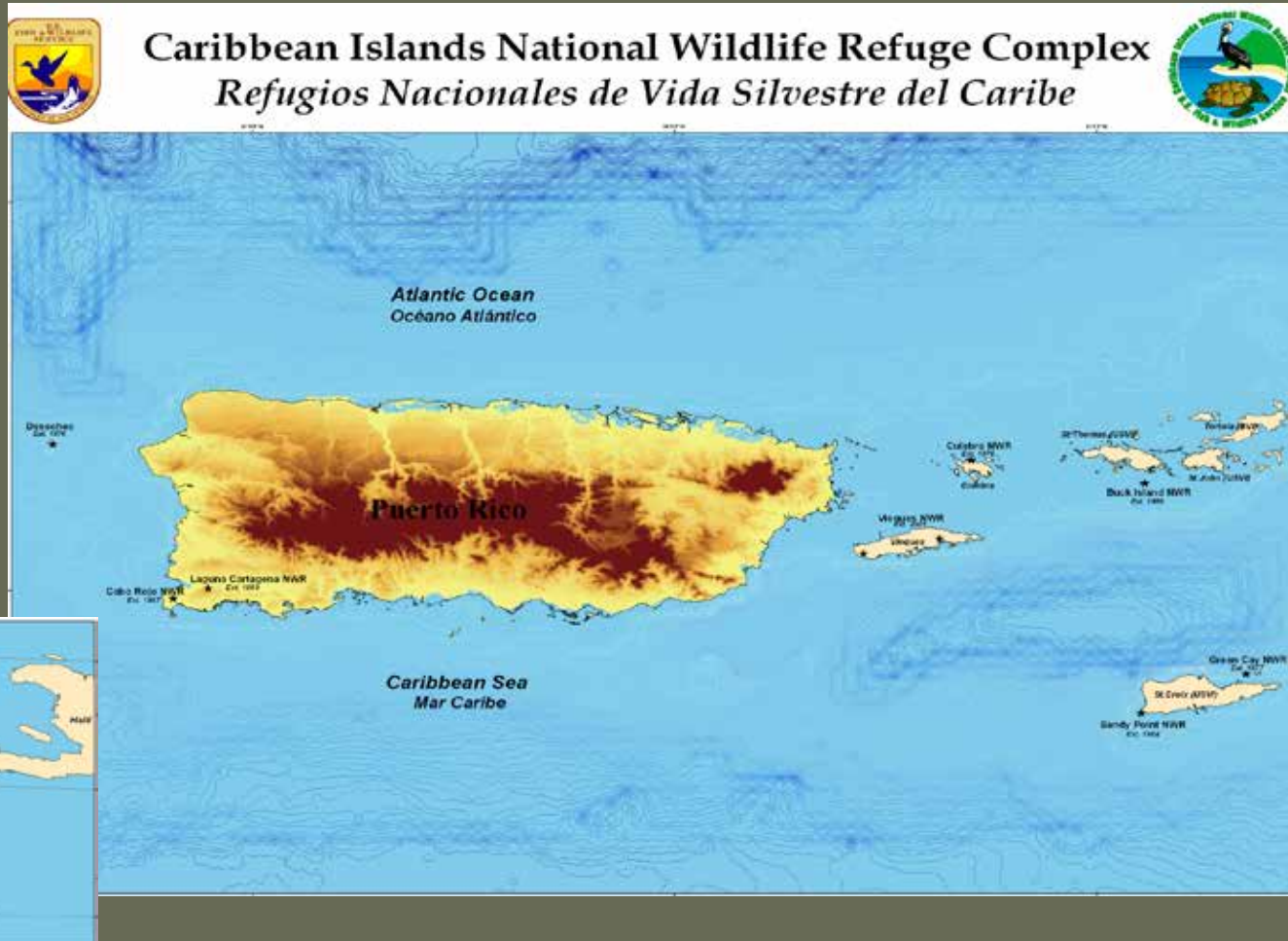


Important Trust Resources on Islands



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Invasive Eradication/Control and Importance of Biosecurity





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- Wider Caribbean has been identified as one of the world's hotspots of biodiversity, with an unusually high proportion of endemic species. 54% of vertebrates and 59% of plants are endemic to the region.
- Islands are important as they represent less than 5% of the earth's land mass, but harbor over 40% of the animals known to be in danger of extinction and have been the site of over 80% of the world's extinctions since 1500.





Navassa Island National Wildlife Refuge

- Navassa claimed as U.S. territory under Guano Act in 1857. Over 1 million tons of guano mined.
- Later administered by Coast Guard and in 1999 became a refuge.
- Includes marine waters within radius of 12 nautical miles, approximately 1200 terrestrial acres
- Eight endemic species of reptiles, four believe to be extinct
- Five species of seabirds breed on Navassa – Magnificent frigatebirds; Brown noddies; Red-footed boobies; White-tailed tropicbirds; and Bridled terns.
- 30% of the some 600 species of arthropods are thought to be endemic





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CULEBRA NATIONAL WILDLIFE REFUGE



- Established in 1909, one of the oldest refuges in the system.
- Consists of 22 off shore cays and parcels on the main island of Culebra
- Over 40,000 Sooty Terns nest on Flamenco Peninsula.
- 24 species of seabirds nest on the 22 off-shore cays.





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Desecheo National Wildlife Refuge

- *Established in 1976*
- *360 acres*
- *Subtropical dry forest*
- *Rodents introduced in the early 1900's*
- *Feral goats introduced in 1788*
- *Farmed and cultivated in the 1920's*
- *Utilized as a bombing range between 1940 and 1952 and for survival training for the U.S. Air Force until 1960*
- *Rhesus macaque monkeys were introduced in 1966 by the National Institute of Health*





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Threats from Invasive Species on Islands



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Desecheo National Wildlife Refuge

- *Historically Desecheo was a major seabird rookery*
- *Early 1900s tens of thousands of seabirds of 8 species were nesting: 15,000 brown boobies, 2,000 red-footed boobies, and 1,500 bridled terns*
- *General decline in breeding birds reported through the 70's and 80's and in 1987 between ten and a few hundred pairs of five species were reported.*
- *In 2010 less than 100 brown boobies were known to roost on the island, one pair of brown noddies was reported nesting, and 17 pairs of bridled terns were recorded nesting.*
- *Little known concerning impacts to three endemic reptiles (Ameiva desechensis, Anolis desechensis, and Sphaerodactylus levinsi) but evidence indicates that reptiles in other areas are negatively impacted by rats.*





Caribbean Islands National Wildlife Refuge Complex



- *Invasive species control and eradication is highest priority management activity*
- *Invasive species include goats, monkeys, rats, mongoose, deer, and many species of plants*
- *Because many of our refuges are small islands or cays, eradication rather than control is a viable option but requires a significant investment of time and funding*
- *High priority eradication project has been Desecheo. Goats have been removed, 1 monkey may remain and eradication of rats in progress*





Species Specific Management and their Contribution to International Conservation Efforts Native Cacti



- The Harrisia mealy bug (*Hypogeococcus pungens*), originally from South America) attacks numerous species of cacti.
- Causes serious deformities and tumor-like growth, often killing the individual.
- Cactus scrub is an important habitat in all our refuges, providing refuge and foraging habitat for numerous species.
- Endemic and endangered cacti are at risk.



Areas of Puerto Rico affected by Hypogeococcus pungens





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Control/Eradication



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Desecheo Invasive Eradication Partnership

Partners

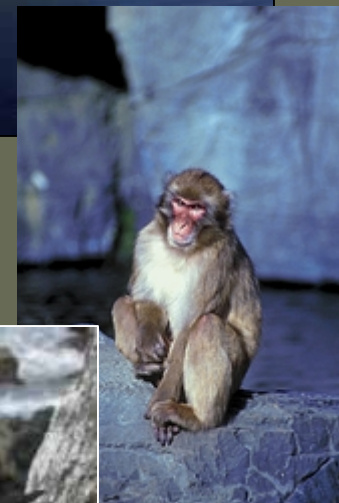
- * *Island Conservation*
- * *Fort Worth Zoo*
- * *Mayagüez Zoo*
- * *PRDNER*
- * *Coastal Program – FWS*
- * *Refuges – FWS*

Results

- * *Removal of over 600 goats – no goats remaining*
- * *Removal of 133 monkeys – perhaps 1 remaining*
- * *Rat eradication conducted in 2012 and 2016*

Benefits

- * *Recovery of native subtropical dry forest*
- * *Reduction of erosion and sedimentation affecting coral reef habitat in the surrounding DNER Natural Reserve*
- * *Recovery of area as essential habitat for nesting seabirds*





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Desecheo National Wildlife Refuge

- Eradication conducted via aerial application of brodifacoum 25D.
- Rodenticide is dispersed from a “bait bucket” slung below helicopter (e.g., Jet Ranger) with a motor driven broadcast device and deflector for coastal areas.
- Multiple low altitude flights - with overlapping (25 to 50%) flight swaths.
- Optimal window for application is January through March, when there is low food availability for rats and thus breeding is not anticipated, not the peak season for breeding birds or reptiles and the weather is optimal (rainfall low).
- Monitoring will be done for at least 2 years after application in order to declare rat free.





Species Specific Management and their Contribution to International Conservation Efforts Native Cacti



- Multiagency task force created in 2008.
- Research currently being done at the Cabo Rojo NWR to study ecology of the pest and alternatives to control – mechanical, biological and chemical.
- Current work by USDA Aphis involves the removal of infected tissue and biological control by a parasitic insect.
- This information can benefit other island nations that area also losing their cactus scrub habitat.





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Biosecurity



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What is Biosecurity?

- Measures designed to prevent, detect and respond to the introduction of non-native species.
- FWS focuses primarily on rodents , invertebrate pests, and plants.
- Prevention is of utmost importance and is most cost effective long term.
- Applies to Fish and Wildlife Service but also to authorized visitors to the island refuges.





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Arrival routes/means of non-native species.

- On vessels, including boats, planes and helicopters that land or approach the islands
- In gear and cargo that is off-loaded.
- On clothing, boots, and equipment carried on an individual
- Floating on marine debris.





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Prevention

- Educate all visitors
- Develop biosecurity plan
- Inspect all clothing, boots, gear and cargo
- Pack all small cargo in rodent proof containers
- Clothes, backpacks, sleeping bags should be freshly washed and not worn or used elsewhere
- All boxes, containers, bags, closed tightly to minimize opportunities for animals to hide inside
- Inspect all vessels that will land or approach and implement rodent control program for these



Biosecurity Measures Islands and/or Cays administered by the US Fish and Wildlife Service



Authorized staff and scientists will check ☒ the outlined biosecurity measures during each visit to the island or cay when packing personal gear, camping equipment and supplies.

Before the trip

- Unpack all equipment; if any pests and/or animals are found while unpacking, please capture and dispose of it properly.
- Place all items that can be hard to clean (e.g. soft items) in a cooler for 48 hours before leaving to the island or cay.
- Tightly close all boxes, containers, bags, etc. to prevent the entrance of animals and/or pests.
- Pack all items at once; do not leave bags/boxes open overnight or for an extended period of time to prevent the entrance of animals, insects and/or seeds.
- Securely close and seal each bag/box after each item is added.
- Pack small equipment in rodent-proof containers.
- Fumigate all equipment to eliminate all pests prior to departure.
- Do not use cardboard boxes to store food or equipment.
- Avoid opening your bag before arriving to the island or cay.

Protect your health,
vessel, and natural resources.
Keep rats off islands!



Caribbean Islands National Wildlife Refuge
www.facebook.com/cinwr
<http://www.fws.gov/caribbean/Refuges/>
787-851-7258





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Detection

- Place bait stations, rodent indicators, cameras, on islands to detect non-native species
- Monitor these frequently
- Monitor native species frequently to detect disease and pest infestation in a timely fashion
- Develop agreements with users of the island to receive information in a timely fashion





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Response

- Placement of bait stations, traps in appropriate locations.
- Hand removal/mechanical removal of established invasive plant(s)
- Capture/removal of animals such as feral goats/dogs/cats



DoMyOwnPestControl.com





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Questions?