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Boiga irregularis+ (reptile)

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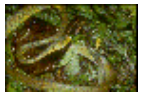


Taxonomic name: *Boiga irregularis* (Merrem, 1802)
Synonyms:
Common names: Braune Nachtbaumnatter (German), brown tree snake (English), brown treesnake (English), culepla (Chamorro-Guam), kulebla (Chamorro-Guam)
Organism type: reptile

This night-loving and tree-loving, brown tree snake (Boiga irregularis) is so secretive in its nature that it is frequently concealed on container ships and in aircraft cargo. It probably arrived on Guam sfter World War II in a cargo ship. Now the wetlands, coastlands and forests of Guam are bereft of nine out of twelve native bird species (and two out of eleven native lizards) due to the snakes voracious appetite. The brown tree snake is not a fussy feeder, stimulating the very real fear that it might drive yet more species to extinction.

Description
This is a slender snake with large eyes and a broad head (much wider than the neck). It is light brownish to yellowish olive, and occasionally a shade of greenish brown. Black speckling may be present. The pupil is vertical. The brown tree snake may reach a length of three metres but is typically only one to two metres long. It is a climbing snake and may be aggressive when cornered

Occurs in:
agricultural areas, coastland, disturbed areas, natural forests, planted forests, range/grasslands, riparian zones, scrub/shrublands, urban areas, wetlands

Habitat description
The brown tree snake occurs in a wide variety of habitats and environments, which is evidence of its great adaptability and which explains why it is such a high-risk invasive species.
In Indonesia (part of its native range) *B. irregularis* is found in the following natural habitats: tropical evergreen forest, montane forest, lowland tropical forest, mangrove forest, montane savanna, wet savanna, seasonal dry forest and closed shrubland. In Indonesia it is also found in the following human-modified environments: deforested land, grassland and croplands (coffee plants, rice, rubber plantations, coconut, tea and maize) (Perry, Dr. G.).
In Guam this snake is found in all terrestrial habitats, but is especially common in forests and human-modified land (Rodda *et al*).
In the Northern Mariana Islands the brown tree snake occurs in the following land cover types: freshwater swamp forest, hebaceous wetland vegetation, tropical montane savanna, coastal strand vegetation and mangrove forest. It also occurs in the following human-modified environs: grassland, pasture, cropland (coconut, coffee, rice, sugar cane and rubber) and deforested land.

General impacts
An effective generalised predator, it decimated the Guamanian avifauna, greatly impacted other terrestrial vertebrates, and caused cascading ecological perturbations. Likely to similarly destabilise ecosystems if established elsewhere. It is a human nuisance and an agricultural pest.

Geographical range
Native range: Native to eastern Indonesia, the Solomon Islands, New Guinea, as well as the northern and eastern coasts of Australia.
Known introduced range: It has been introduced to Guam and the Northern Mariana Islands. In addition to Guam, brown tree snakes have been sighted on Saipan, Tinian, Rota, Kwajalein, Wake Oahu, Pohnpei, Okinawa, and Diego Garcia. To date, this snake is not known to be established on any of these islands except Guam, but frequent reports of snake sightings on Saipan evidence the presence of snakes on this island. In the United States incursions by *B. irregularis* have been repeatedly intercepted.

Invasion pathways to new locations
Aircraft: Both wheelwells and cargo.
Military: Original mode of dispersal. Currently, it is sometimes associated with large-scale exercises and personal cargo of personnel moving from Guam to other duty posts.
Seafreight (container/bulk): Also on the boats themselves.

Local dispersal methods
Road vehicles: As stowaways in various compartments.
Self-propelled (local):
Translocation of machinery/equipment (local): Mostly household, but could be heavy machinery as well.

Management information
In 1995 the brown tree snake was listed by the US Department of Agriculture as among the top three pests requiring control and eradication (Source: SPREP). No large-scale eradication programmes have been employed. Traps, visual inspections, trained dogs, and specialized barriers are in use. Toxicants and bio-control are in development. Efforts are being made to develop artificial attractants. Snake barriers have been used in some situations; vinyl barriers are durable, but the surface finish may degrade over time. Surfaces must be smooth to deter the snake from attempting to climb the barrier. Masonry barriers use a pre-stressed moulded concrete design which is 100% successful in keeping snakes out and is not vulnerable to rat or typhoon damage. However, it has a high initial cost of approximately US$300 per metre. There are currently approximately 2500 snake traps on Guam (Rodda *et al*. 2002).
Guam's importance as a trans-Pacific shipping hub, coupled with the tendency of snakes to seek refuge in cargo make snake dispersal from Guam a serious threat to other island ecosystems (Fritts 1988; Fritts *et al*. 1999; Vice *et al* 2003, in (Vice Engeman and Vice 2005). Because of this the major mission of Commander Naval Forces Marianna Naval Base Guam is to ensure the brown tree snake does not move to other islands; if it moves to Hawaii or the mainland it will reek havoc (Westbrook and Ramos 2005). Brown tree snakes can be easily hidden in ships moving between islands and are currently being moved to new islands in aircraft cargo. Several tree snakes have been detected at Honolulu airport in recent years. Preventing their spread depends on the maintenance of continuous and checking of ships and aircraft cargo. Detector dogs are in use in the Northern Mariana Islands (Perry 1998). The Global Invasive Species Programme is fostering a cooperative effort among experts in Guam, Australia, Hawaii and mainland USA in an effort to combat this pest.
A variety of snake traps have been used on Guam; most consisting of a modified crawfish or minnow trap, housing a live mouse that serves as lure (Vice Engeman and Vice 2005). When implemented the traps are hung on either vegetation or along security fences (Vice Engeman and Vice 2005). New techniques are also being developed such as "pinkies with parachutes", which consist of deceased newborn mice filled with acetametaphine and fitted with tiny parachutes that allow them to drift into trees. As the brown tree snake is arboreal it is more likely to come across the mouse if it is in the tree, and because it has a parachute the bait may land in positions that would be inaccessible to humans setting traps from the ground up (Westbrook and Ramos 2005).

Nutrition
The brown tree snake feeds on birds, lizards, small mammals (including bats), bird and reptile eggs and domestic animals (small pets) (Westbrook and Ramos 2005). Juveniles mainly feed on lizards and amphibians (in particular, frogs) while adults prefer larger animals (birds, mammals).

Reproduction
The brown tree snake lays eggs in clutches of up to 10 or more in native ranges and in clutches of five in Guam. In ideal conditions it reproduces year-round, but in temperate environments reproduction is seasonal. Females may be able to store live sperm for several months.

Lifecycle stages
Incubation of eggs lasts about three months. *B. irregularis* is a highly mobile climber and stowaways on planes and boats are mostly juveniles. Movement may be aggravated by decreased prey availability.

This species has been nominated as among 100 of the "World's Worst" invaders

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Principal sources: Thomas H. Fritts, USGS Midcontinent Research Center, USA.
Invasive Species in the Pacific: A Technical Review and Draft Regional Strategy (2000) (SPREP)

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