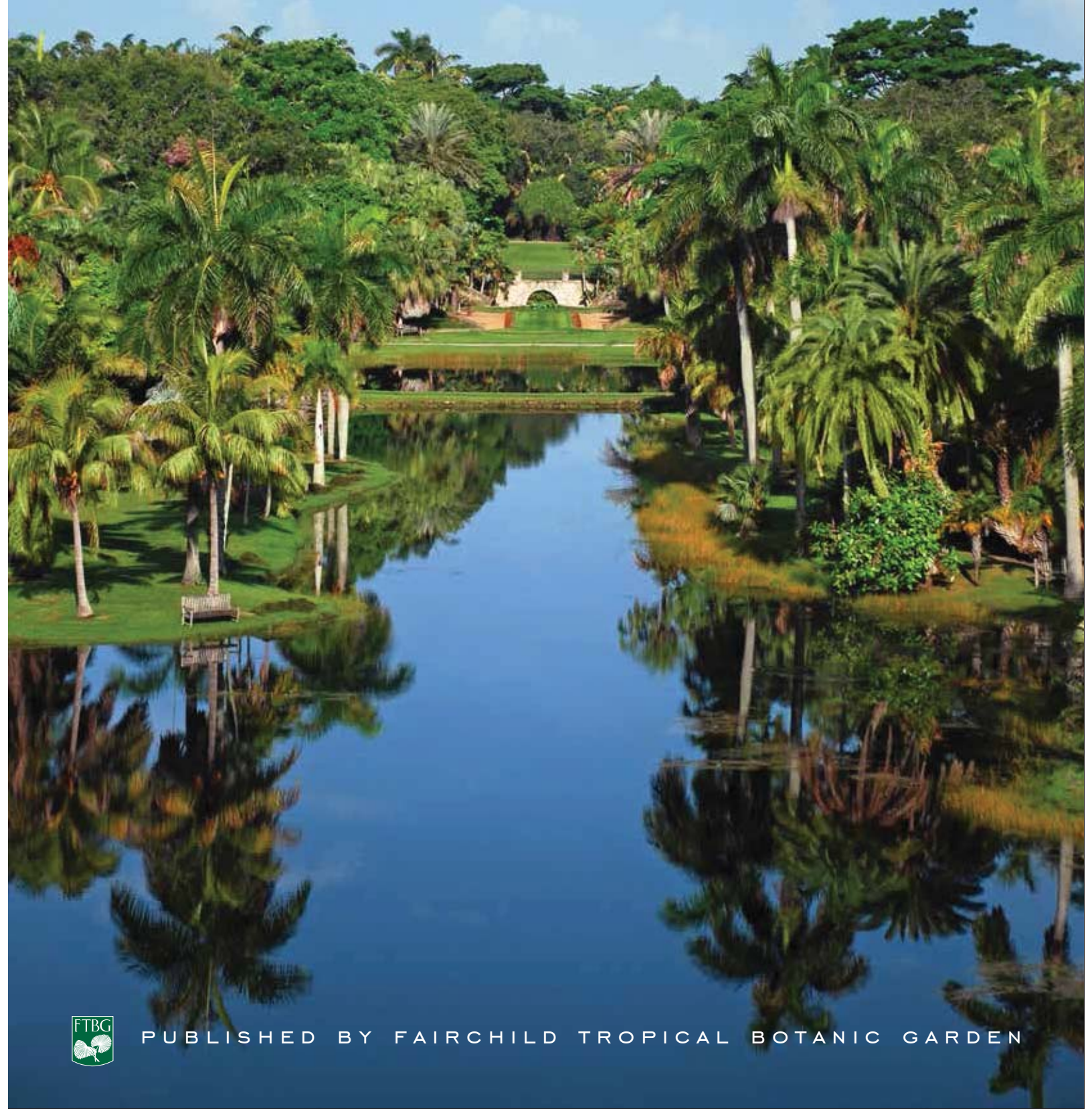


the TROPICAL GARDEN



PUBLISHED BY FAIRCHILD TROPICAL BOTANIC GARDEN

A small worm creates a huge problem

Text and photos by Kenneth Setzer



(T-B)
The Florida Tree snail, *Liguus fasciatus*.
A dead *Liguus* tree snail,
Castellow Hammock, Homestead, Florida

The introduction of non-native species is nothing new—pigs, rats and other animals and plants were carried by ships to remote islands centuries ago. But as transoceanic shipping and travel have become easier, the opportunities for invasion have increased exponentially. Now a small flatworm from New Guinea is having a massive impact on our native gastropods—snails and slugs—especially the stunningly pretty Florida tree snails.

Platydemus manokwari, the New Guinea flatworm, was first collected in August 2012. By 2014, it was known to inhabit multiple locations in Miami-Dade County, and by December of that year, it was found in Puerto Rico. Yet, only in 2015 was a report filed for the first time, noting its presence in South Florida.

Described initially in Manokwari, in West Papua, the flatworm has since been found in Singapore and all the way north to Japan. It's a big problem in Hawaii, an archipelago whose species have suffered many

destructive, non-native invasions. The flatworm, among others, has been implicated in the diminution of several species of rare Hawaiian tree snails in the genus *Achatinella* (Oahu tree snails).

The New Guinea flatworm is a voracious predator and consumer of snails and slugs, and it does not discriminate between rare natives and common invasives. A denizen of dark, damp places, the flatworm found a very suitable home in South Florida. It slithers on a coat of mucus, swinging its head back and forth using chemoreceptors to alert itself to the presence of a snail trail, which often leads to *Liguus* or *Orthalicus* tree snails; it then ensnares the snail in a sticky film of mucous before using its pharynx feeding tube to digest and consume the snail's soft body.

Florida tree snails like *Liguus fasciatus* are sometimes called living gems, and for good reason. Their spiraling, conical shells are glossy, often spotted, mottled, striped in satisfying shades of ivory, orange, sunburst yellow, brown and pink on




a cream background. There are over 50 subspecies in Florida alone, with even more in Cuba. They, like the banded tree snail *Orthalicus*, are especially vulnerable when they descend to the ground to mate and lay eggs.

At Castellow Hammock Preserve & Nature Center in Homestead, the tree snail situation seems dire. Since it's one of my favorite places, I go there often to photograph tree snails. Now the ground is littered with empty shells, and New Guinea flatworms are abundant. Dr. Alc ie Warren of Miami-Dade County Parks, Recreation and Open Spaces and Dr. Tim Collins, professor in the department of biological sciences at Florida International University, have noted that, "Though native snails face multiple threats, around August 2015, we noticed tree snails, *Liguus* and *Orthalicus*, disappearing from Castellow."

At this point, I wish I could talk about definitive flatworm control, but no pesticides are registered for use

against it. Experts need to learn more about its biology and invasiveness to find a vulnerability. One possibility, discussed at a Tree Snail and Flatworm Working Group Meeting I attended at the Miami-Dade County Extension Office in Homestead last August, is hot water: water that is at least 110 degrees Fahrenheit kills the flatworm. They travel the world in soil, so soaking potted plants, or better yet, bare root plants, in the hot water would kill the flatworm without harming the plants.

Many questions remain, however, such as how long the soaking needs to be and how it should vary given volume of soil, etc. This labor-intensive control doesn't seem likely to happen on a large scale. But cleaning construction equipment—even shoes—exposed to soil would certainly help. For now, it looks like just the beginning of a long battle, with ex-situ breeding and conservation of the snails a possibility. 

ABOVE
The New Guinea flatworm
Platydemus manokwari.

RIGHT
Hammerhead planarian (*Bipalium vagum*), a non-native flatworm, but not the New Guinea flatworm. Note its different coloration and hammer-shaped head.




A harmless Brahminy blind snake (*Indotyphlops braminus*).

Quick Guide to Identification

The New Guinea flatworm, up to 4 inches long, but usually shorter, is a glossy dark brown with a tan mid-dorsal stripe (on its back) and a paler underside. It tapers at both ends, but on very close examination, its head is slightly pointier, with two small, dark eyespots no larger than pinpoints. The worm may appear darker in daylight, with the stripe more pronounced at night. It is a nocturnal animal, active and hunting particularly after rain, though you may spot it in the day hiding under decaying plant matter.

A harmless lookalike is the Brahminy blind snake. It's no thicker than a pencil lead, very dark brown to solid black, flicks its tongue like a snake and, upon close inspection, has scales. Another flatworm, the hammerhead planarian, shows reverse coloration: It's tan with a dark stripe. Its hammer-shaped head makes it easy to differentiate from the New Guinea flatworm.



 For now, if you find a flatworm, don't handle it. Report it via the "ivegot1" app, on eddmaps.org or by calling 1.888.ivegot1.