UF | IFAS Extension
UNIVERSITY of FLORIDA

Giant African Land Snail

(Lissachatina fulica)

FLORIDA FIRST DETECTOR

What is the Giant African Land Snail?

- **Originated in East Africa**
- **Up to 8 inches in length**
- **Nocturnal**
- **Found in**
  - Agricultural areas
  - Natural forests
  - Wetlands
  - Urban areas

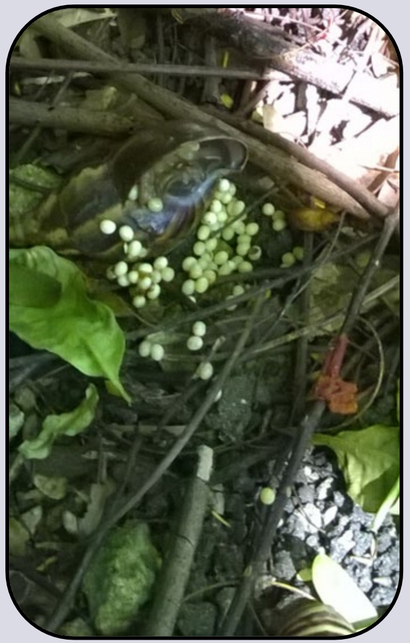
Photo: Pest and Diseases Image Library, Bugwood.org, #5502140

- The Giant African land snail (GALS) is one of the most damaging snails in the world.
  - Like warm and humid conditions
  - Usually found in moderately litter and under ground cover

GALS Biological Notes

- Larger ones will climb into bushes, trees, and onto manmade objects such as buildings, fences, etc.
- Can remain inactive in soil for a year during unfavorable conditions
- Hermaphroditic
- Can store sperm from one mating up to 2 years

Location of Research Colony	Florida Biological Control Laboratory (Quarantine)
Sample Size	350 snails
Average Height at 2 months	33 mm (1.3 in)
Average Height at 5 months	87 mm (3.4 in)
Average Age of Sexual Maturity (months)	6 months
Average Height at Sexual Maturity	90 mm (3.5 in)
Average Fecundity (egg/year)	2,033 eggs per year
Average Fecundity (eggs/clutch)	312 eggs per clutch
Average Egg % viability	48% viability
Self Fertilization (yes/no)	yes



GALS Life Cycle

Eggs

Juveniles

Adults

Photos: (Left to Right) - David Robinson, USDA-APHIS-PPQ; Lyle Buss, Department of Entomology and Nematology, University of Florida; Florida Department of Agriculture and Consumer Services, Division of Plant Industry.

Similar Species Found in Florida

Lissachatina fulica

Drymaeus dormani

Drymaeus multilineatus

Euglandina rosea

Orthalicus floridensis

Photos: (Top left and center) - Lyle Buss, Department of Entomology and Nematology, University of Florida. (Top right) - http://www.jaxshells.org/galleryt.htm. (Bottom left) – http://www.jaxshells.org/0572.htm. (Bottom right) - http://www.jaxshells.org/2586.htm.

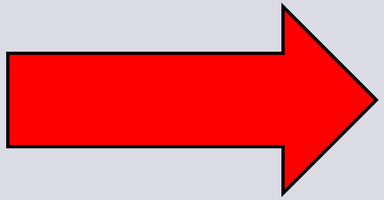
Native Florida Snails

- 40 Exotic species
- 100 native snail species
- Most are less than ½ long
- Most do not feed on plants

Why is the Giant African Land Snail a major concern?

Eat everything

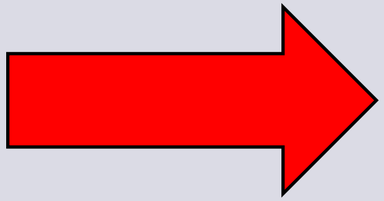
- Over 500 types of plants
- Native snails
- Plaster and stucco



Major threat to agriculture industry and native ecosystem

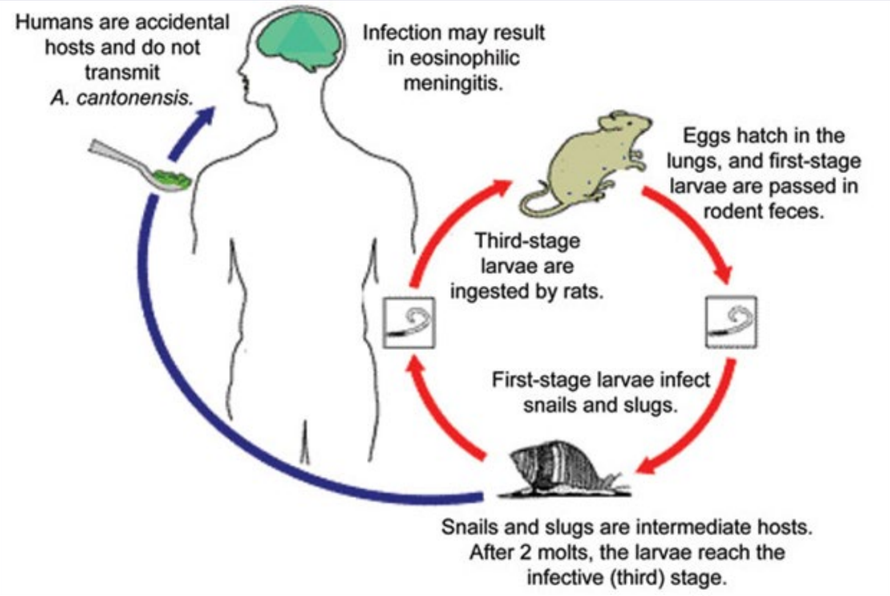
Carry multiple parasites

- Rat lungworm
- Round worm
- *Aeromonas hydrophila*



Human health concern

Why is the Giant African Land Snail a major concern?



[CDC - Angiostrongylus]

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

A-Z Index | Search | Advanced Search

Parasites - Angiostrongyliasis (also known as Angiostrongylus Infection)

- Angiostrongylus
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- Biology – *Angiostrongylus costaricensis*
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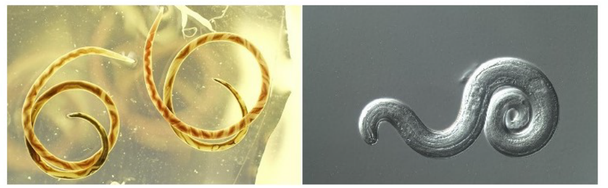


Angiostrongylus is a parasitic nematode that can cause severe gastrointestinal or central nervous system disease in humans, depending on the species. *Angiostrongylus cantonensis*, which is also known as the rat lungworm, causes eosinophilic meningitis and is prevalent in Southeast Asia and tropical Pacific islands. The recognized distribution of the parasite has been increasing over time and infections have been identified in other areas, including Africa, the Caribbean, and the United States.

Learn more about *Angiostrongylus cantonensis* in this new motion graphic video.

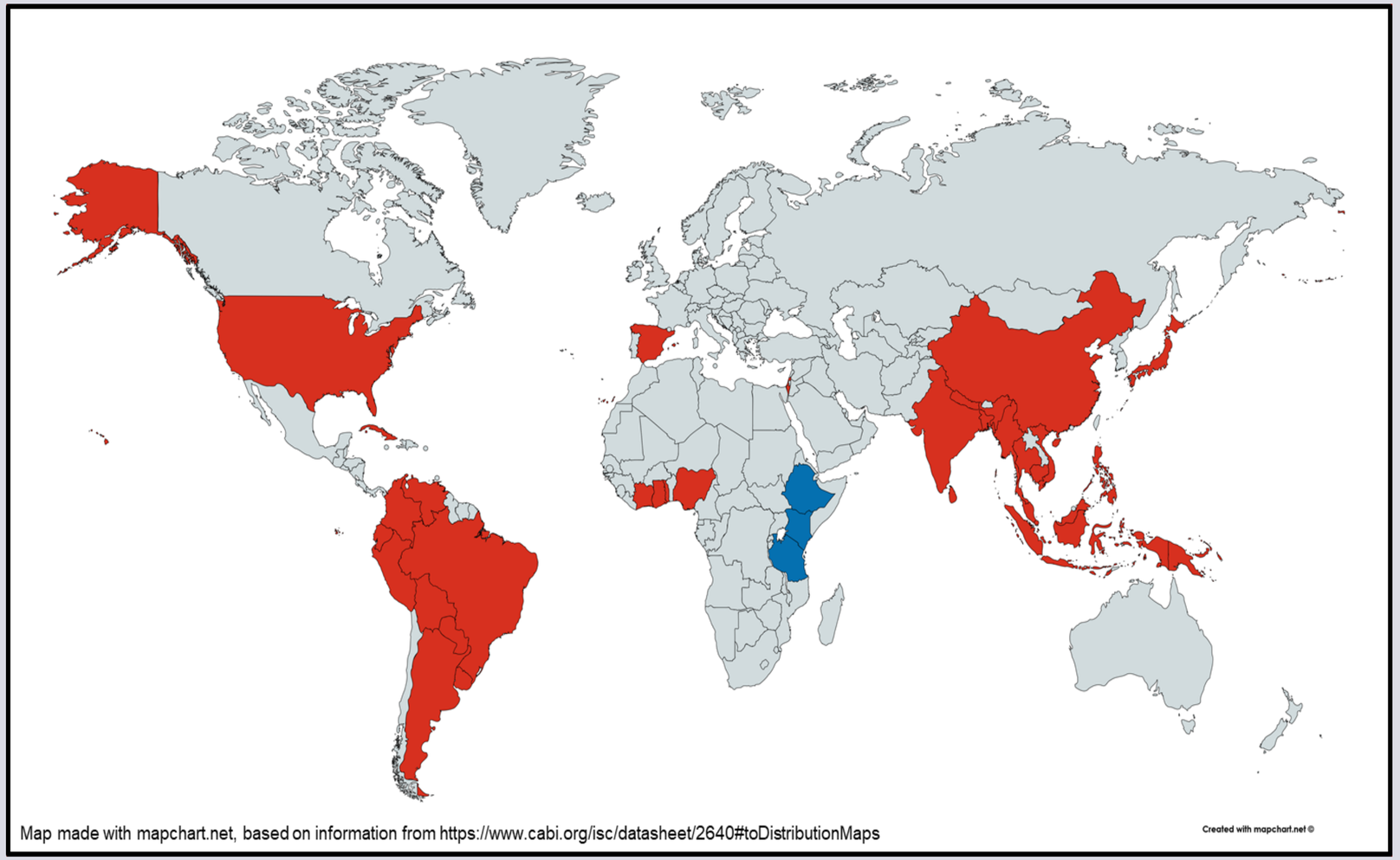
Angiostrongylus costaricensis causes eosinophilic gastroenteritis and is found in Latin America and the Caribbean.

Images: Left: Two *Angiostrongylus* adult females recovered from rat lungs. The distinctive, coiled pattern seen in both worms is created by the white uterine tubes and red, blood-filled intestine. Right: *Angiostrongylus cantonensis* third-stage (L3), infective larva recovered from a slug. Image captured under differential interference contrast (DIC) microscopy. (Credit: DPDx)

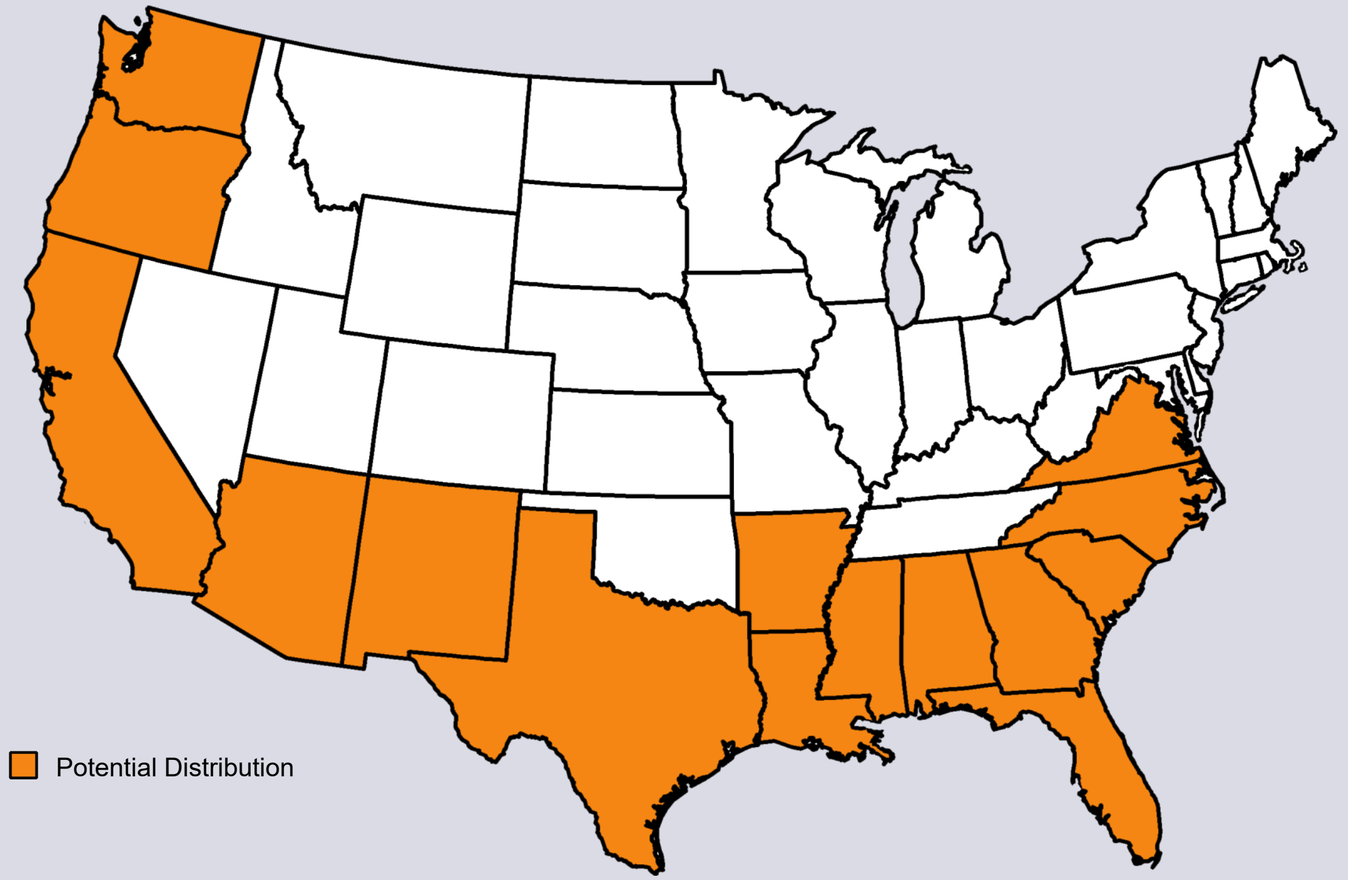
- About Angiostrongylus — Most common questions answered...
- Diagnosis — Tests for infection...
- Epidemiology & Risk Factors — Who gets it and how...
- Treatment — Medication and steps to take...
- Biology — Stages of parasitic development...
- Prevention & Control — How to stay healthy or get better...
- Disease — Signs and symptoms of the disease...
- Resources for Health Professionals — What you need to know...

Page last reviewed: September 22, 2020
Content source: Global Health, Division of Parasitic Diseases and Malaria

Global Distribution



Potential U.S. Range



Map based on http://www.aphis.usda.gov/import_export/plants/manuals/emergency/downloads/nprg_gas.pdf

History and Distribution in Florida

- **1966** – Introduced into Miami-Dade County
- **1969** – First detected in Miami-Dade
- **1975** – Eradicated from Florida
  - $1 million total in eradication effort & 18,000 snails removed
- **2011 - 2017** - Detected in Miami-Dade and Broward
- **2021** – Eradicated in Florida
  - $23 million total in eradication effort & over 168,000 sanils removed
- **2022** – Detected in Pasco and Lee
  - Rat lungworm, *Angiostrongylus cantonensis*, in the GALS population in Pasco Co.
  - Currently under eradication

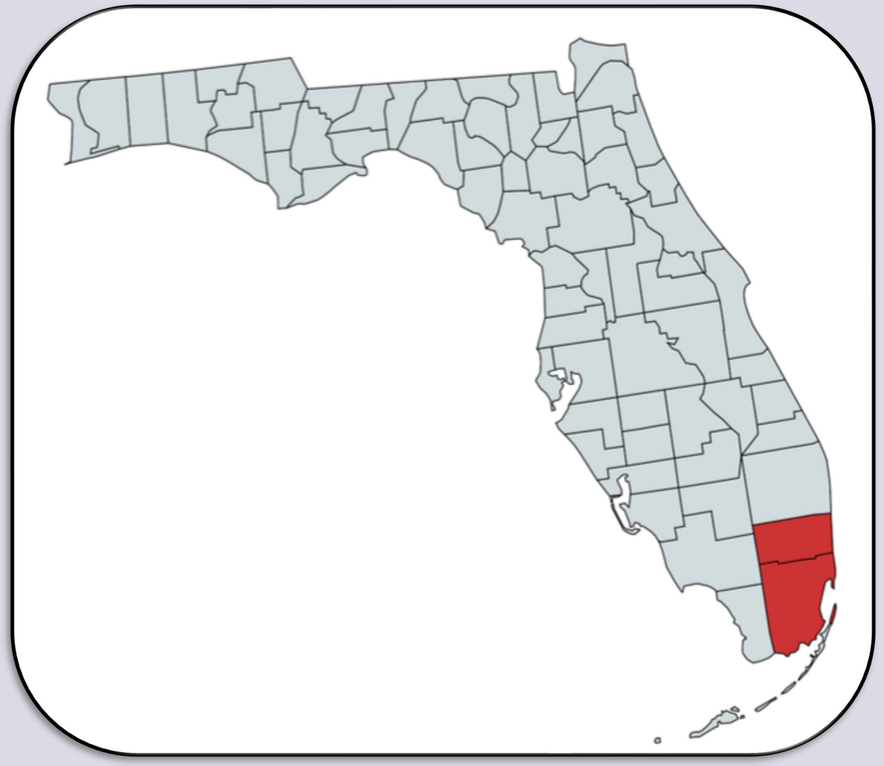


Photo: FDACS, https://www.fdacs.gov/Divisions-Offices/Plant-Industry/Pests-Diseases/Giant-African-Land-Snail/Eradication-Updates-and-Information

Control and Management in Florida

- **Detect**
  - Survey areas to determine if GALS is present
  - Intercept new introduction of GALS from imports
- **Monitor**
  - Verify the ongoing situation of GALS in South Florida
- **Eradicate**
  - Complete elimination of GALS from Florida

- **General Management**
  - Traps
  - Eliminate favorable habitats (high humidity)
  - Limit irrigation
  - Snail bait

Detection

- Snail Detector Dogs
  - **2013** - Detector dogs join the eradication program
  - Inspection by K9 team is required before decommission of an area
  - **2019** - Snail detector dog Mellon helped find over 100 snails on a cargo ship in Port Canaveral
- Master gardeners
  - **2022** - Pasco Co.
- FL First Detectors Program
  - Ongoing training about invasive species

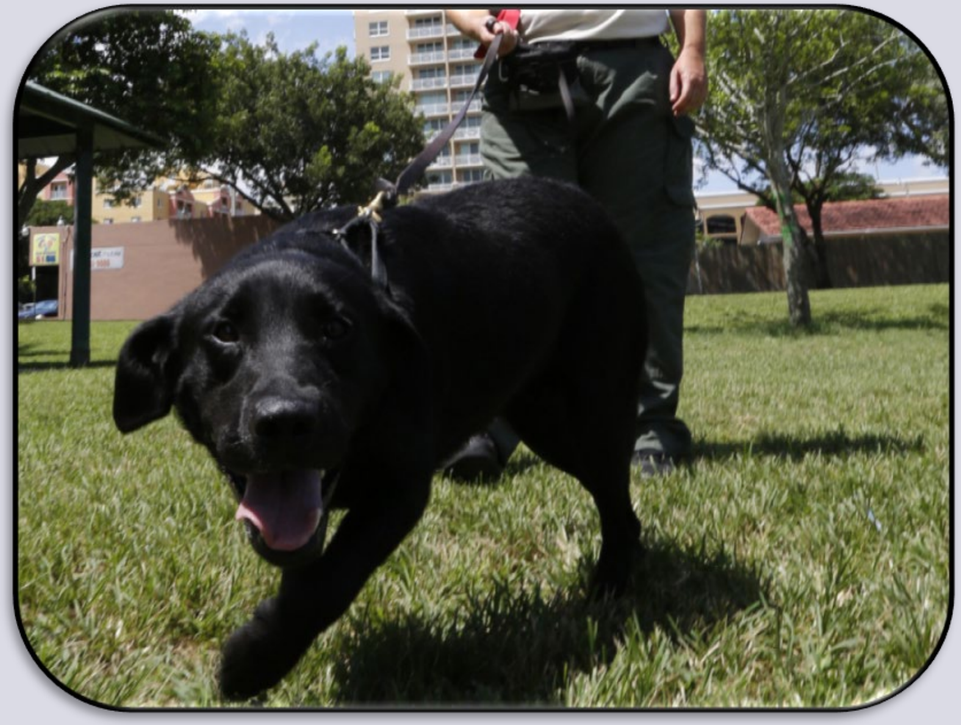


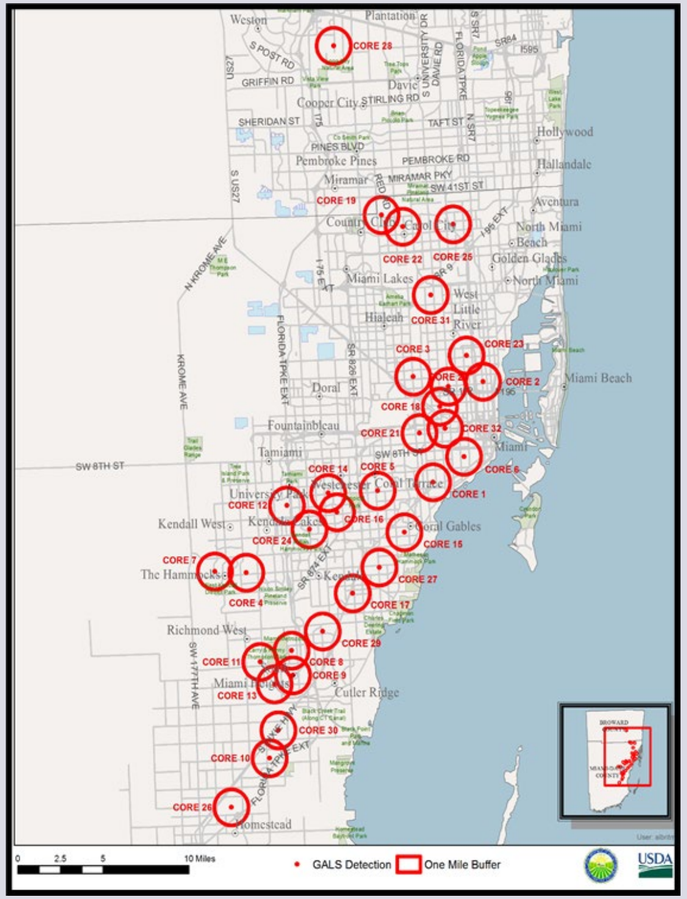
Photo: Joe Skipper, NPR

Monitoring

Photos: Top and Bottom: Florida Department of Agriculture and Consumer Services, Division of Plant Industry; Right: David G. Robinson, USDA APHIS PPQ, Bugwood.org #1265031

Eradication

- Several eradication programs in Florida
  - 1970s, 2010s, and a recent ongoing
- Monitoring and detection of these areas play a key roles
- Goal is to eliminate the Giant African Land Snail
- Quarantined areas must be decommissioned



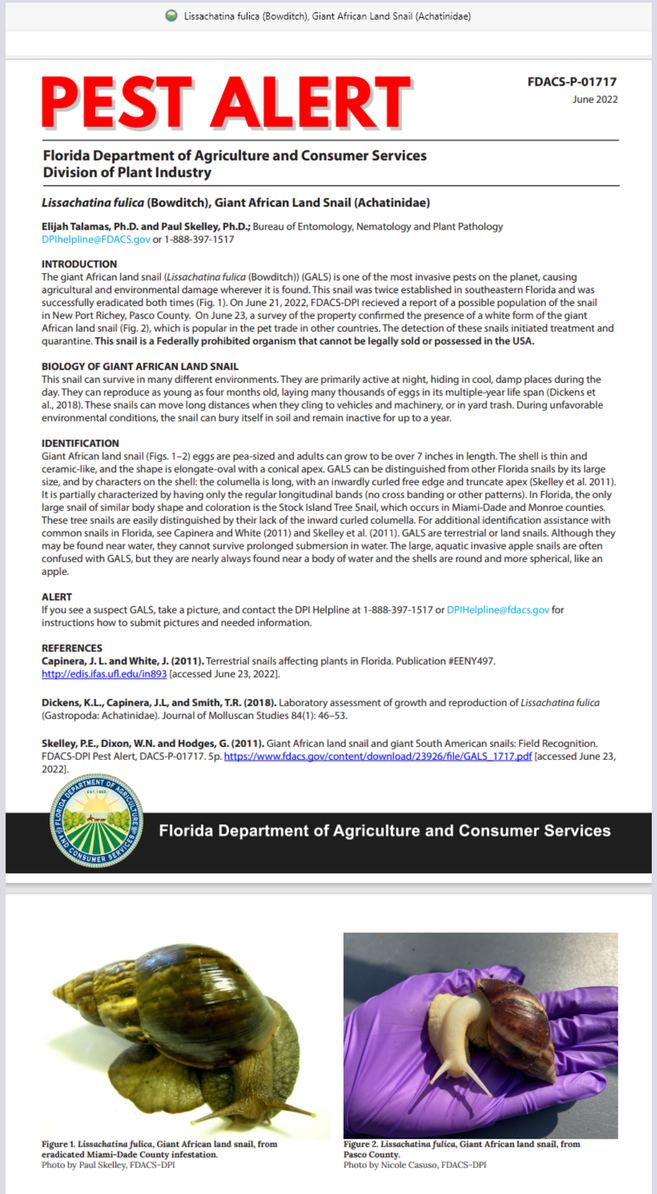
Eradication – In Progress

- **June 23, 2022: New Port Richey, Pasco County, FL**
  - FDACS confirmation of GALS presence in this county
  - Reported through Pasco County Extension Master Gardener (June 21)
  - Efforts via Lyle Buss, Entomology and Nematology Department Insect Identification Lab
  - FDACS confirmation of rat lungworm (DPI - Nematology Laboratory, July 15)

- **December 2022: Lee County, FL**
  - FDACS confirmation of GALS presence in this county
  - Regulatory efforts
  - Required increased survey and voluntary treatment in the area

- **June 2023: Broward County, FL**
  - FDACS confirmation of GALS presence in this county
  - Detection was reported to FDACS Division of Plant Industry Helpline
  - Eradication efforts underway

- **FEDERALLY PROHIBITED ORGANISM- CANNOT BE LEGALLY SOLD or POSSESSED in the UNITED STATES.**



Lissachatina fulica (Bowditch), Giant African Land Snail (Achatinidae)

PEST ALERT

FDACS-P-01717
June 2022

Florida Department of Agriculture and Consumer Services
Division of Plant Industry

***Lissachatina fulica* (Bowditch), Giant African Land Snail (Achatinidae)**

Elijah Talamas, Ph.D. and Paul Skelley, Ph.D.; Bureau of Entomology, Nematology and Plant Pathology
DPIhelpline@FDACS.gov or 1-888-397-1517

INTRODUCTION
The giant African land snail (*Lissachatina fulica* (Bowditch)) (GALS) is one of the most invasive pests on the planet, causing agricultural and environmental damage wherever it is found. This snail was twice established in southeastern Florida and was successfully eradicated both times (Fig. 1). On June 21, 2022, FDACS-DPI recieved a report of a possible population of the snail in New Port Richey, Pasco County. On June 23, a survey of the property confirmed the presence of a white form of the giant African land snail (Fig. 2), which is popular in the pet trade in other countries. The detection of these snails initiated treatment and quarantine. **This snail is a Federally prohibited organism that cannot be legally sold or possessed in the USA.**

BIOLOGY OF GIANT AFRICAN LAND SNAIL
This snail can survive in many different environments. They are primarily active at night, hiding in cool, damp places during the day. They can reproduce as young as four months old, laying many thousands of eggs in its multiple-year life span (Dickens et al., 2018). These snails can move long distances when they cling to vehicles and machinery, or in yard trash. During unfavorable environmental conditions, the snail can bury itself in soil and remain inactive for up to a year.

IDENTIFICATION
Giant African land snail (Figs. 1–2) eggs are pea-sized and adults can grow to be over 7 inches in length. The shell is thin and ceramic-like, and the shape is elongate-oval with a conical apex. GALS can be distinguished from other Florida snails by its large size, and by characters on the shell: the columella is long, with an inwardly curled free edge and truncate apex (Skelley et al. 2011). It is partially characterized by having only the regular longitudinal bands (no cross banding or other patterns). In Florida, the only large snail of similar body shape and coloration is the Stock Island Tree Snail, which occurs in Miami-Dade and Monroe counties. These tree snails are easily distinguished by their lack of the inward curled columella. For additional identification assistance with common snails in Florida, see Capinera and White (2011) and Skelley et al. (2011). GALS are terrestrial or land snails. Although they may be found near water, they cannot survive prolonged submersion in water. The large, aquatic invasive apple snails are often confused with GALS, but they are nearly always found near a body of water and the shells are round and more spherical, like an apple.

ALERT
If you see a suspect GALS, take a picture, and contact the DPI Helpline at 1-888-397-1517 or DPIHelpline@fdacs.gov for instructions how to submit pictures and needed information.

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Skelley, P.E., Dixon, W.N. and Hodges, G. (2011). Giant African land snail and giant South American snails: Field Recognition. FDACS-DPI Pest Alert, DACS-P-01717. 5p. https://www.fdacs.gov/content/download/23926/file/GALS_1717.pdf [accessed June 23, 2022].

Florida Department of Agriculture and Consumer Services

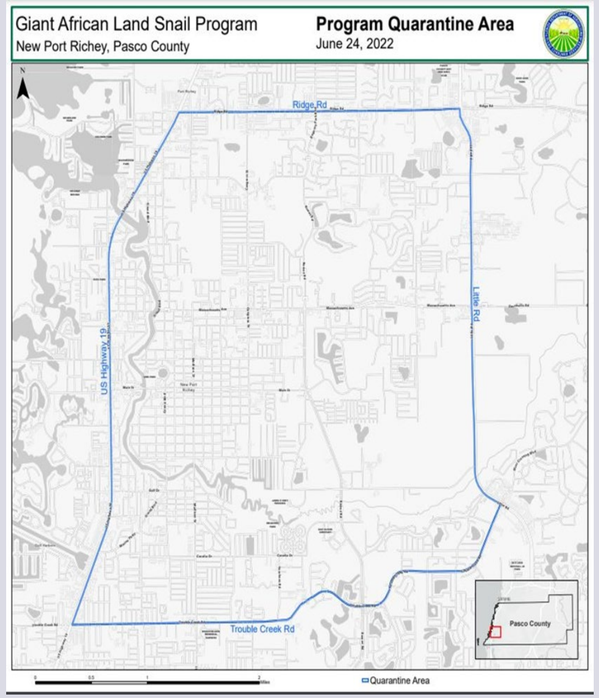
Figure 1. *Lissachatina fulica*, Giant African land snail, from eradicated Miami-Dade County infestation.
Photo by Paul Skelley, FDACS-DPI

Figure 2. *Lissachatina fulica*, Giant African land snail, from Pasco County.
Photo by Nicole Casuso, FDACS-DPI

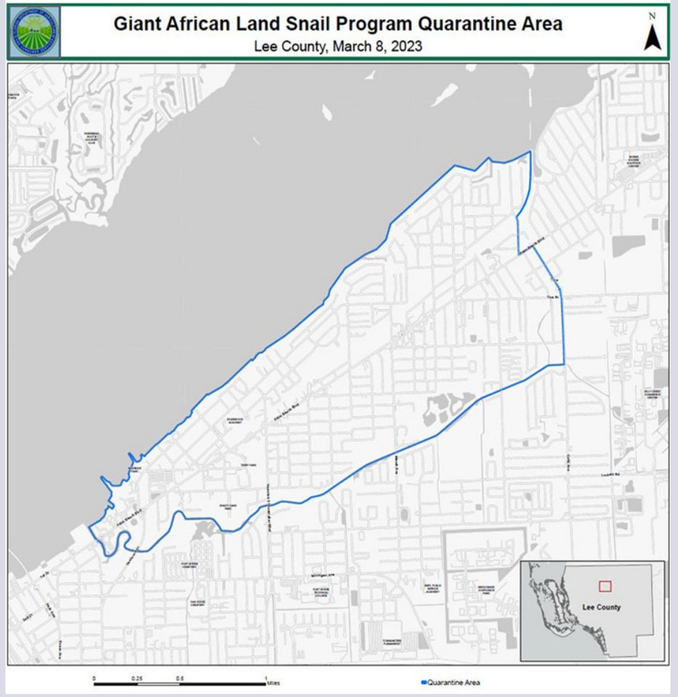
Lissachatina fulica (Bowditch), Giant African Land Snail (Achatinidae) (fdacs.gov)

Quarantined Counties

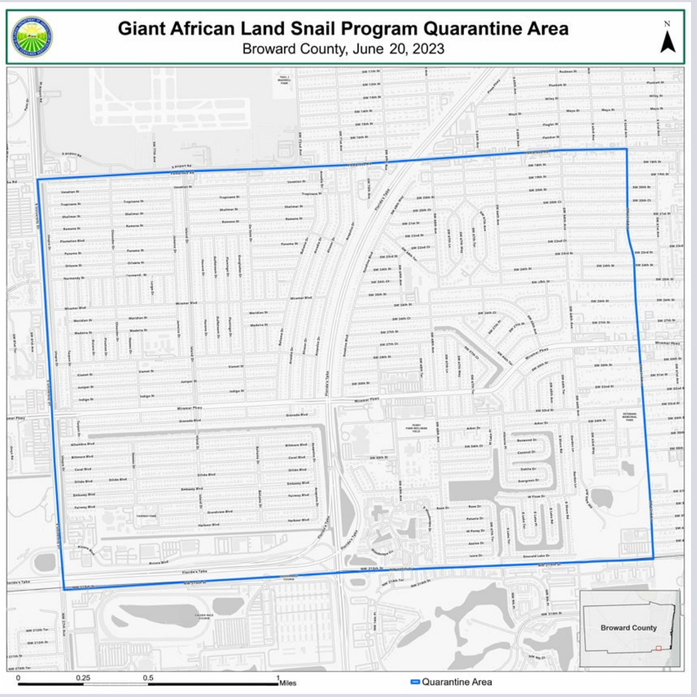
Lee Co.:
March 8, 2022



Pasco Co.:
June 24, 2022



Broward Co.:
June 20, 2023

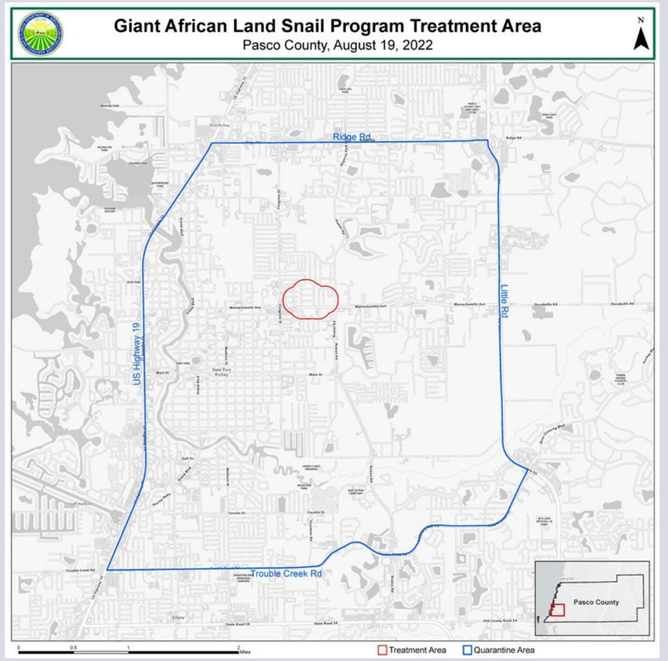


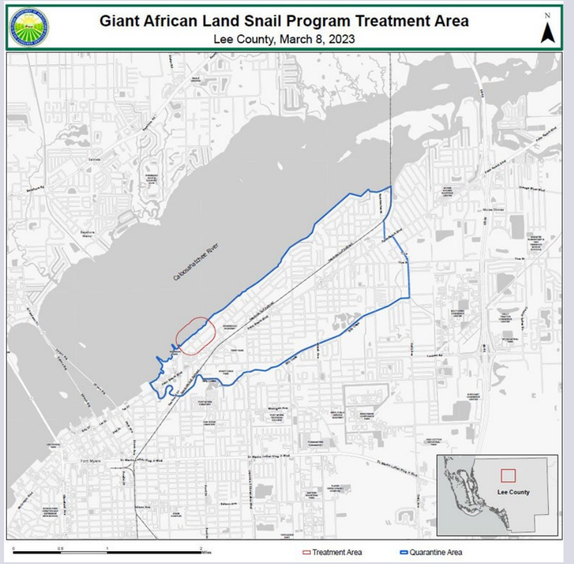
It is unlawful to move the giant African land snail or regulated articles like plants, plant parts, plants in soil, yard waste, debris, compost or building materials, within, through or from a quarantine area without a compliance agreement.

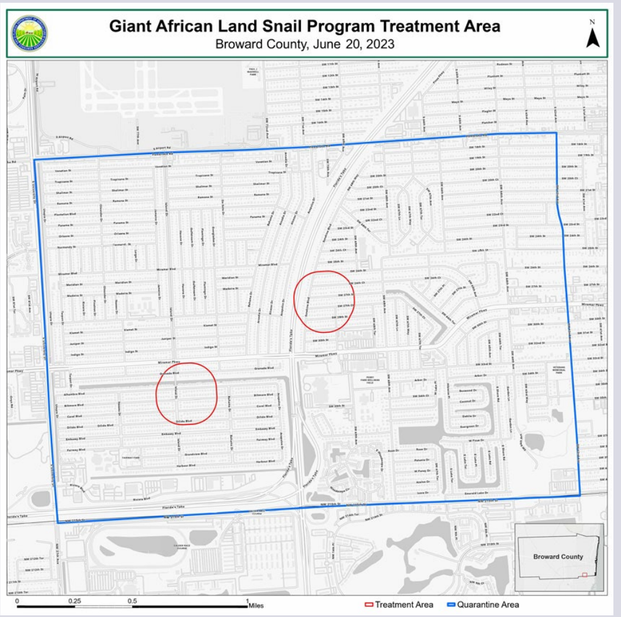
- **Call 1-888-397-1517 or DPIHelpline@FDACS.gov**

GALS Program Treatment in Florida

- Metaldehyde
  - pesticide for snails and slugs
  - approved for use in fruit, vegetables and ornamentals in the field or greenhouse.
- Generally applied as a granule, spray, dust or bait pellet.
- Disrupts the mucus production of snails and slugs
- Reduces digestion and mobility
- Increases susceptibility to dehydration
- Others: iron phosphate, and boric acid
- Regulatory officials from FDACS-DPI and USDA-APHIS-PPQ







- 19 August 2022 in Pasco, 8 March 2023 in Lee, and 20 June 2024 in Broward
- Property owners inside treatment area notified in person or by posted noticed at least 24 hours prior to planned pesticide treatment.

https://www.fdacs.gov/Agriculture-Industry/Pests-and-Diseases/Plant-Pests-and-Diseases/Invasive-Mollusks/Giant-African-Land-Snail

General Snail Management

- **Cultural Control**
  - Limit irrigation
  - Eliminate favorable habitats (high humidity)
- **Physical Control**
  - Traps
- **Biological Control**
- **Chemical Control**
  - Snail bait

How can you help?

DO

- Report suspected Giant African Land Snails to FDACS
  - Tollfree Hotline:

    1-888-397-1517

DON'T

- Eradicate snails with out proper identification

Photo: Andrew Derksen, FDACS/DPI, bugwood.org, #5444581

Reporting to UF/IFAS Faculty in Florida

- Local county extension office

https://sfyl.ifas.ufl.edu/find-your-local-office/

- Insect ID Lab - Dr. Lyle Buss

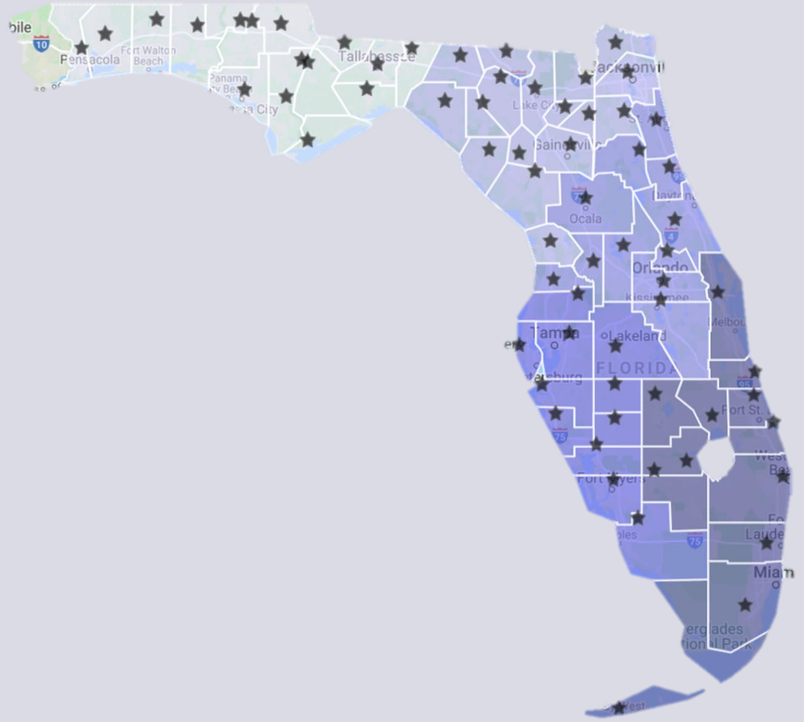
http://entnemdept.ufl.edu/insectid/

- Nematode Diagnostic Lab - Dr. Billy Crow

http://nematology.ifas.ufl.edu/assaylab/index.html

- Plant Diagnostic Center - Dr. Carrie Harmon

https://plantpath.ifas.ufl.edu/extension/plant-diagnostic-center/



Reporting to FDACS-DPI in Florida

Florida Department of Agriculture and Consumer Services (FDACS) - Division of Plant Industry (DPI)

- FDACS, DPI Responsibility
  - Announcing detection or establishment of new invasive species.
  - Reporting is a legal obligation under Florida Statute 581.091.
- Submission Form
  - http://forms.freshfromflorida.com/08400.pdf
  - https://www.fdacs.gov/Agriculture-Industry/Pests-and-Diseases/How-to-Submit-a-Sample-for-Identification

FDACS, DPI Contact

- Dr. Leroy Whilby, Bureau Chief-Entomology, Nematology and Plant Pathology
  - 352-395-4661
  - Leroy.whilby@freshfromflorida.com
- Dr. Paul Skelley, Assistant Chief-Entomology, Nematology and Plant Pathology
  - 352-395-4678
  - Paul.skelley@freshfromflorida.com
- Division of Plant Industry Hotline
  - 1-888-397-1517
  - DPIHelpline@FDACS.gov

Reporting using DDIS in Florida

Digital Diagnostic and Identification System (DDIS)

- Digital Diagnostic Collaboration
  - Extension agents
  - Laboratories
  - Clinics
  - Specialists
- https://ddis.ifas.ufl.edu/

Find More Information At:

https://entnemdept.ufl.edu/ffd/

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Collaborating Agencies

- U.S. Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS)
- Cooperative Agricultural Pest Survey Program (CAPS)
- Florida Department of Agriculture and Consumer Services (FDACS)
- National Plant Diagnostic Network (NPDN)
- Sentinel Plant Network (SPN)
- University of Florida Institute of Food and Agricultural Sciences (UF-IFAS)
- Protect U.S.

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