

Texas Invasives'

Research, Programs & Outreach

January 17, 2024
Galveston Bay Council

Ashley Morgan-Olvera, M.S.

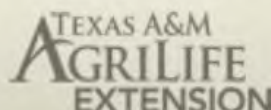
Director of Research & Education

Texas Invasive Species Institute

Huntsville, TX



Sam Houston
State University



TEXAS A&M
FOREST SERVICE



THE TEXAS
STATE
UNIVERSITY
SYSTEM

Texas Invasive Species Institute

Focuses on **Early Detection and Rapid Response (EDRR)** to newly invasive pests and **Enhance Public Education** about invasive species.

PUBLIC EDUCATION: is the best way to make progress in the fight against Invasive Species. By showing *what* an Invasive Species is, how humans spread them, and we can show them how to stop it.

- Audiences of all ages:
 - Master Naturalists/Gardeners
 - Austin/Huntsville/Conroe schools (2nd-12th graders)
 - Citizen Scientist Workshops
 - State Stewardship Meetings



TEXASINVASIVES.ORG: TISI now runs this website and reporting database. We are working on expanding the reporting capabilities and updating the website.

Invasive Species Databases

Texasinvasives.org & TSUInvasives.org

Illustrated Descriptions
Distribution & Habitat
Biology & Spread/Threat
History of Introduction
Control & Management
Native Look-a-likes

References



ABOUT | IWIRE | SPOTLIGHT | CONTACT

INVASIVES 101 TAKE ACTION CITIZEN SCIENTISTS PROFESSIONALS RESOURCES

INVASIVES DATABASE GO

INVASIVES DATABASE

- INVASIVES DATABASE
- INVASIVE PLANTS
- INVASIVE ANIMALS
- INVASIVE INSECTS
- INVASIVE PATHOGENS
- INVADERS OBSERVATIONS
- MAP INVASIVES
- COUNTY COMPARISONS

KEEP INFORMED

Sign up for the iWire to get breaking news, event info and the species spotlight.

your email

HELLO INVASIVE SPECIES.
GOODBYE TEXAS.

SALVINIA MOLESTA

GIANT SALVINIA

Synonym(s):
Family: Salviniaceae (Water Fern Family)
Duration and Habit: Annual, Perennial Fern



Photographer: Keith Bradley
Source: Science/Conservation Biologist, Bugwood.org

DESCRIPTION

Salvinia is a rootless, floating aquatic fern. Emergent groups of leaves (fronds), oblong and flat (smaller growth forms) or semi-cupped/folded (larger growth forms), grow in chains and float on the water surface forming dense mats. Leaves grow in pairs and grow to approximately 1/2 inches wide and 1 inch long. Brown, thread-like leaves hang underwater, joining at a node along a horizontal, underwater stem and are similar in appearance to a root system. The upper surface of the green leaves is covered with rows of white, coarse hairs, acting as a water repellent. The hairs of giant salvinia are joined at the tips in an egg beater shape.

Go Back | Printer Friendly Fact Sheet

- Federal Noxious Weed
- TDA Noxious Weed
- TPWD Prioritized Exotic Species
- Invasive Plant Atlas of the US

NOTE: means species is on that list.

[Additional Images](#)
(opens new window or tab)

out | Facilities | Contact | Search

THE TEXAS STATE UNIVERSITY SYSTEM


Texas Invasive Species Institute

Home Invasives 101 Early Detection/Rapid Response News Experts Inventory

REDBAY AMBROSIA BEETLE

Xyleborus glabratus

Class: Insecta
Order: Coleoptera
Family: Curculionidae



Photographer: Michael C. Thomas Affiliation: Florida Department of Agriculture and Consumer Services Source: www.bugwood.org Copyright: CC BY-NC 3.0

DESCRIPTION

Adult Description: The redbay ambrosia beetle (*Xyleborus glabratus*) is a dark colored, bullet shaped beetle with small puncture-like dents covering the elytra, and is 2 mm long when mature. The redbay ambrosia beetle is a member of the family Curculionidae along with weevils, which can be identified with a characteristic snout representing modified mandibles for taking up nutrients. Positive identification of *X. glabratus* is impossible without the help of a professional, but the glabrous upper surface and abrupt apical declivity may help distinguish this invasive beetle from other native species.

Larva Description: Redbay ambrosia beetle larvae, consistent with most beetles, are legless, white grubs. The head capsule of the redbay ambrosia beetle grub is amber colored. These flightless grubs are found feeding on infected trees beneath or on the surface of the bark.

NATIVE ORIGIN

India, Japan, Myanmar, and Taiwan

CURRENT LOCATION

U.S. Habitat: The redbay ambrosia beetle can be found in areas where host plants are present, most commonly found on redbay and sassafras hosts. Within the U.S. the redbay ambrosia beetle is found feeding on healthy trees and shrubs. In areas where the beetle is native, stressed or dying trees are shrubs are utilized as host plants.

U.S. Present: FL, GA, LA, MS, SC and TX

MANAGEMENT

You can help prevent the spread of the redbay ambrosia beetle by avoiding the transport of firewood. Wood chips of infested trees should not be transported out of the area, but left on-site as mulch.

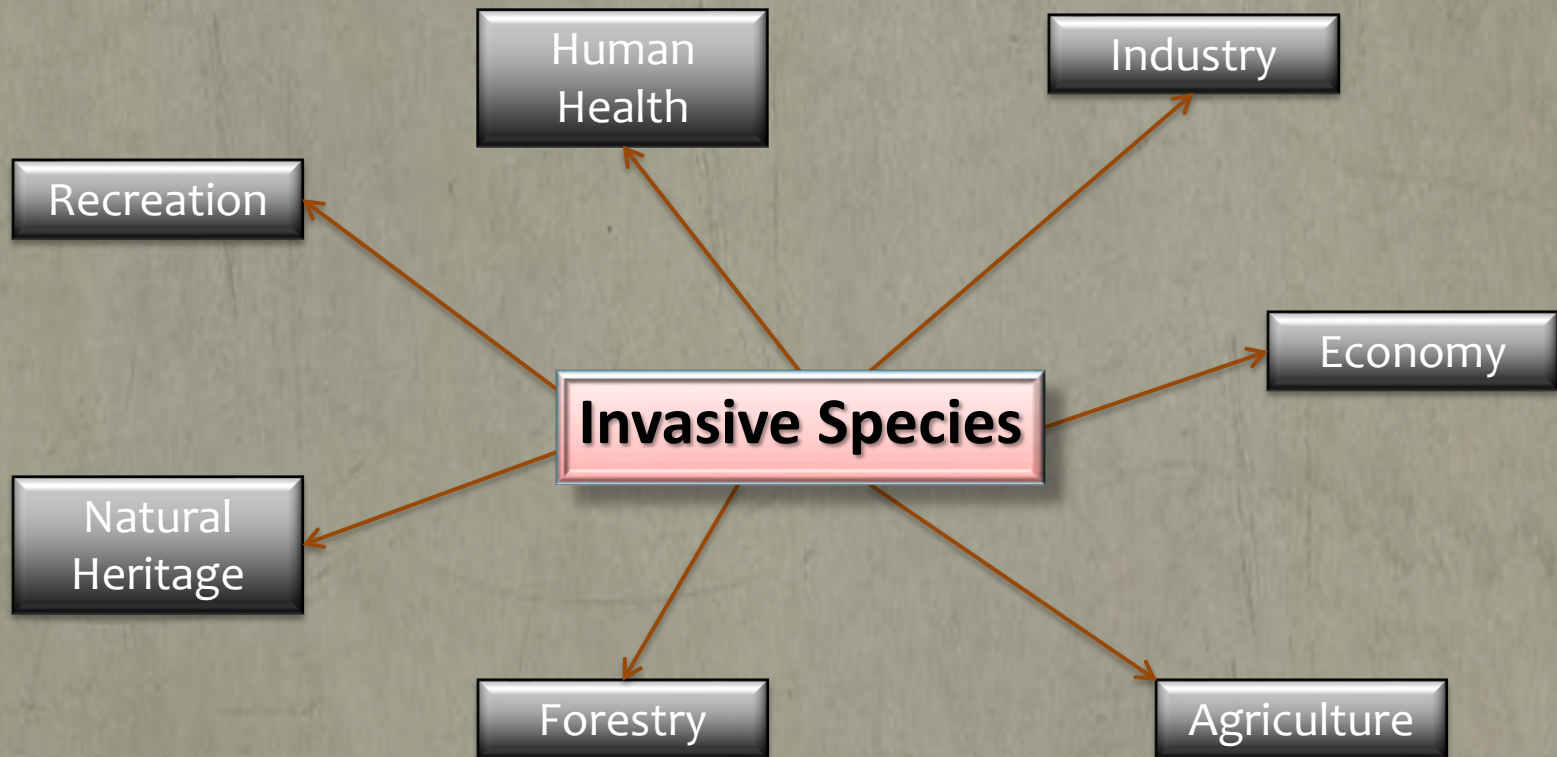
What is an Invasive Species?

The Federal Definition

*a species that is non-native (or alien) to the ecosystem under consideration and whose introduction **causes or is likely to cause economic or environmental harm or harm to human health.***
(Executive Order 13112, 1999)

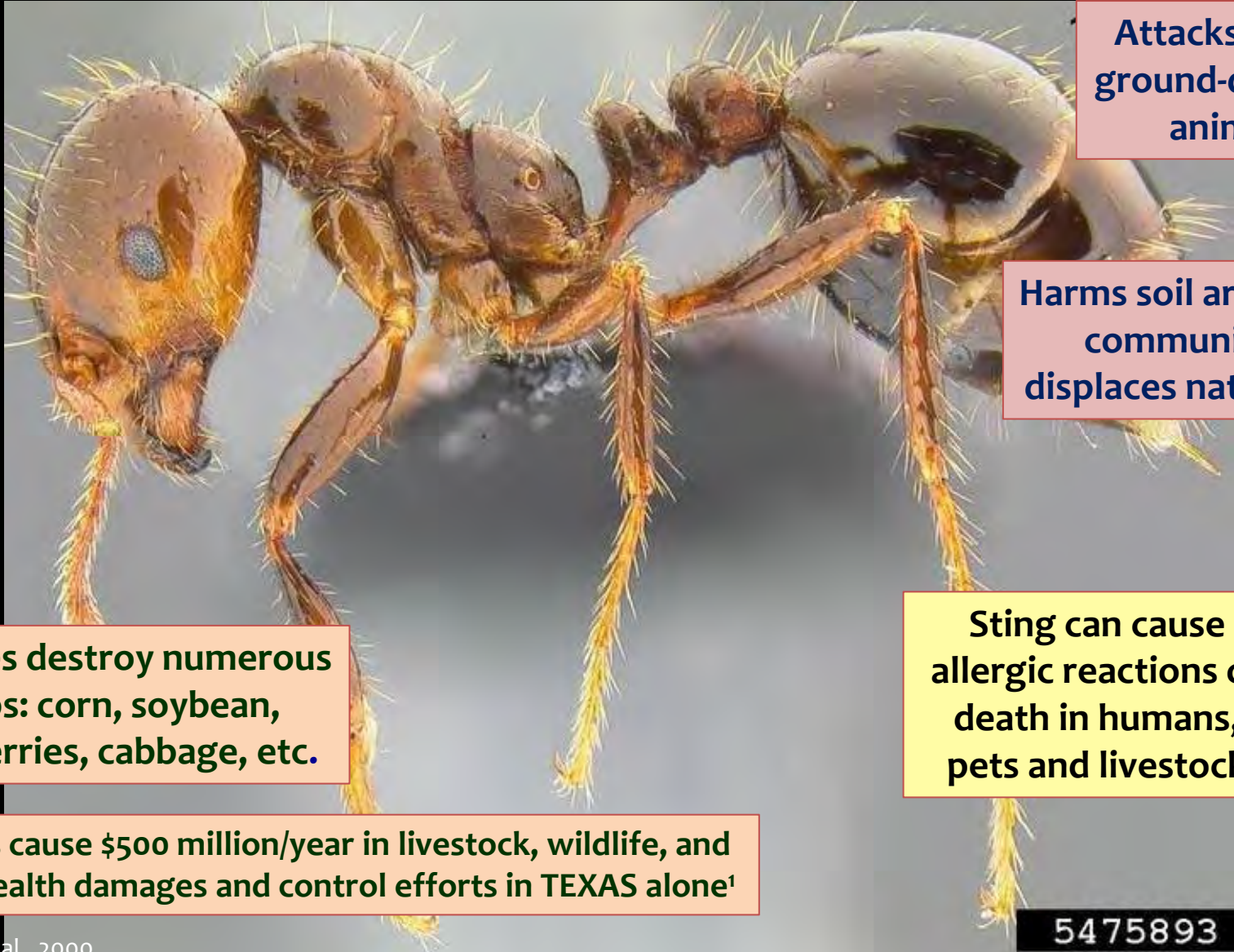


Invasive Species Impacts



Red Imported Fire Ant

(*Solenopsis invicta*)



Attacks native
ground-dwelling
animals

Harms soil arthropod
community &
displaces native ants

Colonies destroy numerous
crops: corn, soybean,
blueberries, cabbage, etc.

Sting can cause
allergic reactions or
death in humans,
pets and livestock

Fire ants cause \$500 million/year in livestock, wildlife, and
public health damages and control efforts in TEXAS alone¹

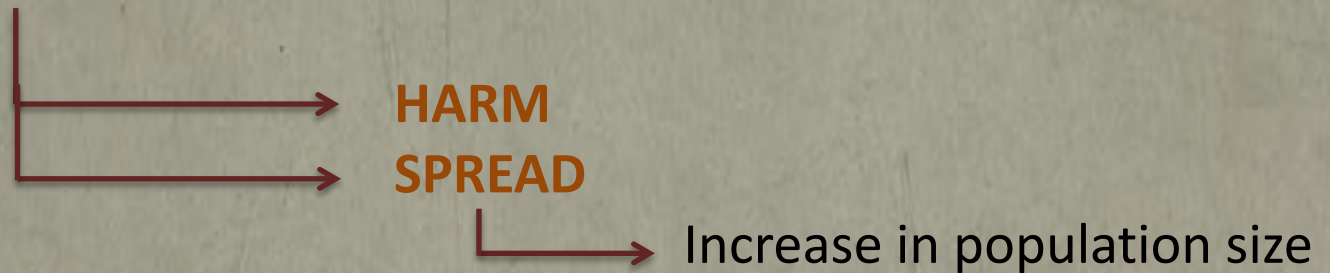
¹Pimentel et al., 2000

5475893

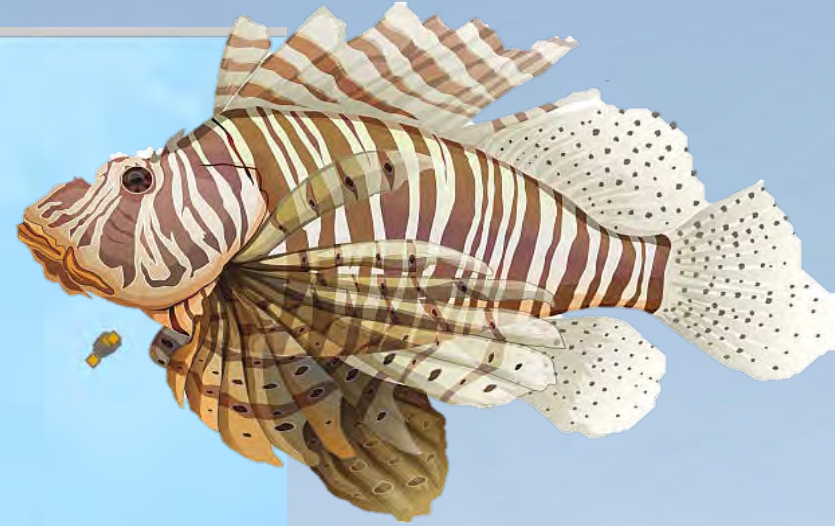
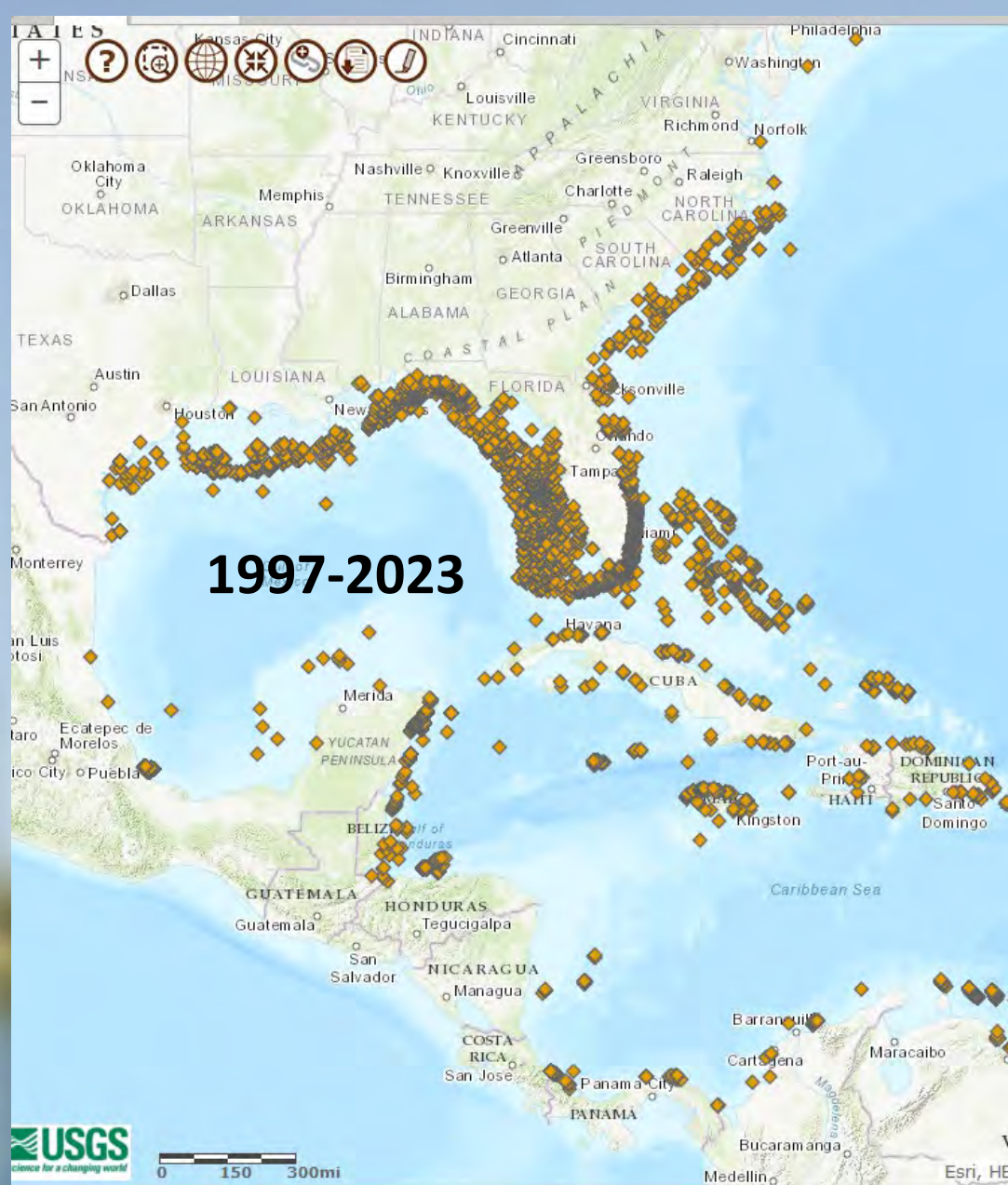
Why Do We Battle Invasive Species?

Recall

Invasive species



Lionfish Spread & Appetite for Destruction



How Invasive Species Spread

- **Natural Dispersal**

- Production of offspring

- Wind- or water-borne seeds or larvae
 - Animal-borne seeds or larvae

- Movement of adults

- Swim, fly, walk/run, etc.

- **But.... can't always explain expansion**



How Invasive Species Spread

- Natural Dispersal
 - Production of offspring
 - Wind- or water-borne seeds or larvae
 - Animal-borne seeds or larvae
 - Movement of adults
 - Swim, fly, walk/run
 - Can't always explain expansion

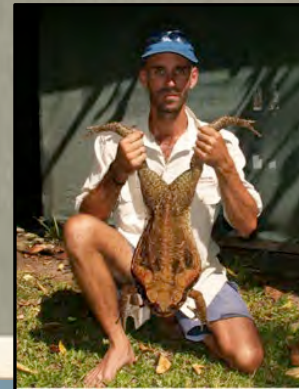
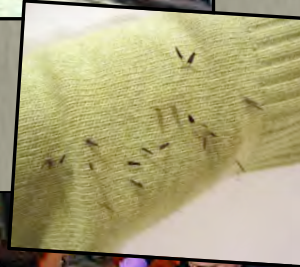
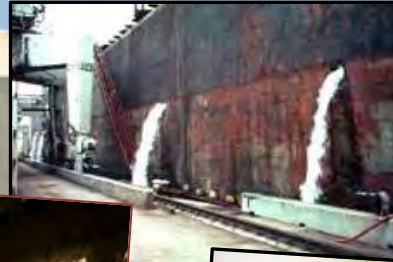


• **Human Assistance**

How Invasive Species Spread

Accidental

- Produce
- Nursery stocks
- **Ship ballasts**
- **Packing materials & containers**
- Travelers
- Hay & Flowers
- Vehicles
- **Firewood**
- Boots and gear



Purposeful

- Ornamental planting
- **Erosion control**
- Wildlife value
- Agriculture/Sport
- **Pets/Aquariums**
- **Biological Controls**



Texas Invasive Species Institute

Focuses on **Early Detection and Rapid Response (EDRR)** to newly invasive pests and **Enhance Public Education** about invasive species.

DETECTION SURVEYS: TISI has assisted USDA-APHIS, USFS, TPWD, TAMU Forest Service and other entities with **early detection and rapid response surveys & outreach.**

- **Invasive Pest Surveys**

- Emerald Ash borer
- Pine & Oak bark beetles
- Redbay Ambrosia Beetle
- Asian Citrus Psyllid
- Asian Pine-Defoliating Moths
- Apple Snails & Invasive Slugs



Texas Invasive Species Institute

Focuses on **Early Detection and Rapid Response (EDRR)** to newly invasive pests and **Enhance Public Education** about invasive species.

CITIZEN SURVEYS: TISI also relies on its widespread network of engaged citizens who visit our website to **report on invasive species we may not be detecting through survey or cannot fully detect by ourselves.**

Citizens have been instrumental in tracking:

- Emerald Ash borer, RAB & ACP
- Apple Snails & Invasive Slugs
- Asian Jumping Worms
- Giant Salvinia
- Zebra Mussels
- Hammerhead flatworms
- New Guinea flatworm
- THOUSANDS of invasive plant reports: Tallow, Privet, Johnsongrass, Giant Reed, Honeysuckle, etc.



Texas Invasive Species Institute

Focuses on **Early Detection and Rapid Response (EDRR)** to newly invasive pests and **Enhance Public Education** about invasive species.

SURVEY MAPPING: Data acquired through citizens or surveys is shared with invasive species mapping entities, like as **EDDMapS**. Allows data to be available to researchers across the country. We also share data with **TPWD, HARC and APHIS**. Uploads to iNAturalist pending.

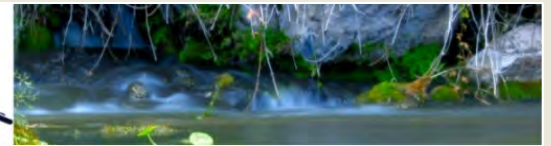
- Invasive Plant locations & densities
 - On Texasinvasives.org
- Weed Risk Assessments for TPWD stored on website
- Invasive/Pest distribution
 - Pending: Habitat preference of *Ips grandicollis* beetles
- Emerging invasive pest locations
 - Sent to partners upon receipt & confirmation of ID.



Texas Invasive Species Institute

Focuses on **Early Detection and Rapid Response (EDRR)** to newly invasive pests and **Enhance Public Education** about invasive species.

WATER QUALITY & E. COLI TESTING: TISI has the unique opportunity of sharing a facility with the **TRIES Analytical Research Laboratory**. Proximity allowed us to become a successful HGAC Partner for **TCEQ's Texas Clean Rivers Program (CRP)**.



- **Quarterly CRP sampling (2016-present)**
 - East Fork San Jacinto, Neblett's Creek, Winters & Tarkington Bayous
- **Bacterial Monitoring Projects (2023)**
 - White Oak Creek, Conroe
 - Unnamed Tributary Greens Bayou, Houston
- **E. Fork San Jacinto Watershed Protection Plan**
 - Steering Committee- Educational Rep.
 - Watershed Protection Plan development & input
 - Local Connection: HQ within stakeholder range



**EAST FORK SAN JACINTO RIVER
WATERSHED PARTNERSHIP**

Public Awareness Campaigns

- Protect the Lakes You Love.
- Hello Zebra Mussels.
Goodbye Texas Boating.
- Don't Move Firewood
- Never Dump Your Aquarium

PROTECT THE LAKES YOU LOVE.

CLEAN, DRAIN AND DRY.
TPWD.TEXAS.GOV/ZEBRAMUSSELS



DON'T LET YOUR PETS BECOME PESTS.



NEVER DUMP YOUR AQUARIUM.

Texasinvasives.org Public Awareness

The iWire monthly email newsletter

- Important updates
- Invasive species spotlights
- News from TX and beyond
- Workshop Schedules

Citizen Scientists of the Month Friends of West Bouldin Creek Greenbelt

The December Citizen Scientists of the Month are the Friends of West Bouldin Creek Greenbelt and the West Bouldin Creek Neighborhood Association in Austin. The partnership was nominated by restoration team members, who remove invasive species in the West Bouldin Creek Greenbelt.

The community



New Rules to Prevent Zebra Mussel Spread in Texas

In the state's ongoing effort to combat the spread of invasive zebra mussels, the Texas Parks and Wildlife Department has created new rules to halt the spread of the species. Effective December 10th, all boats operating on public water in 17 Northeast Texas counties must be drained after use or face legal consequences. [Read More.](#)

The Texas Parks and Wildlife Commission is inviting public comments on a proposal to add 30 additional counties to the recently-implemented rules preventing zebra mussel spread. [Read More.](#)

Comments on potential additions can be made in writing to Ken Kurzawski, TPWD Inland Fisheries, 4200 Smith School Road, Austin, TX 78744, by emailing ken.kurzawski@tpwd.texas.gov, or in person at any of the two following public hearings.

- Tuesday, January 7 in Austin at TPWD Headquarters, Commissioners Meeting Room - 4200 Smith School Road.
- Thursday, January 9 in Waco at the McLennan County Courthouse, Commissioners Courtroom - 1st Floor, 501 Washington Ave.

Visit www.texasinvasive.org/zebramussels for detailed information on zebra mussel prevention.



CLEAN

Clean your boat, trailer and gear for removing all weeds, plants and debris.

DRAIN

Drain all water from the boat, including the motor, fuel, bilge and live wells.

DRY

Do not leave your boat for several days before the next launch. Dry the boat and gear for at least 48 hours.

Requires Control, Treatment, Management & Monitoring



Invasive Species

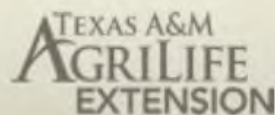


Take Action!

What YOU can do...



Sam Houston
State University



TEXAS A&M
FOREST SERVICE



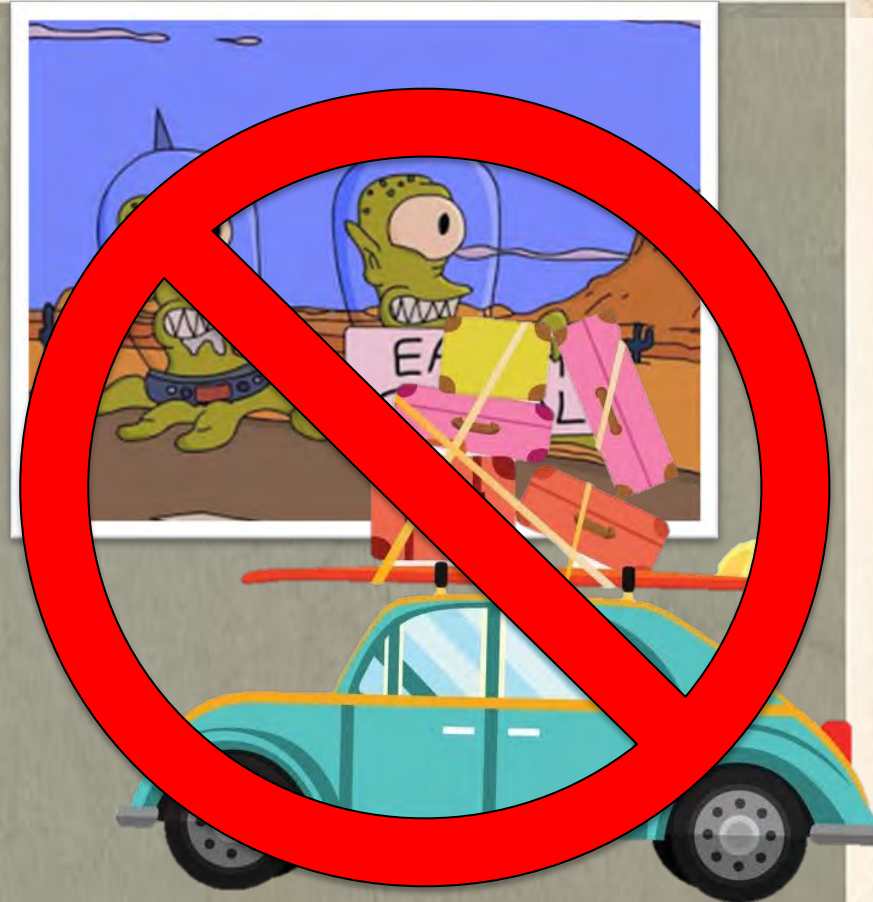
THE TEXAS
STATE
UNIVERSITY
SYSTEM™

How to Stop Species from Spreading?

Prevent Dispersal!

Two-pronged approach:

1. Early detection
2. Prevent transport by humans
 - Different for terrestrial vs. aquatic species





WATCH OUT!



Invasive plants often sold at nurseries!

“Invasive” does NOT mean “Prohibited to sell”



Heavenly Bamboo
(*Nandina domestica*)

UGA2307107



5408393

Privets
(*Ligustrum* species)



Golden Bamboo
(*Phyllostachys aurea*)

UGA0001072

Elephant Ears

(*Colocasia*, *Alocasia*, & *Xanthosoma*)



5400347



UGA1150069

Honeysuckles
(*Lonicera* species)



5451631

Tree-of-Heaven
(*Ailanthus altissima*)



5401413

Mimosa Tree
(*Albiza julibrissin*)

Noxious and Invasive Plants List

Texas Department of Agriculture - Compiles this list of species.

Check this and texasinvasives.org before purchase

REPORT NURSERIES SELLING THESE PLANTS; These are actually illegal.

Contact: ARM001@shsu.edu



TEXAS DEPARTMENT OF AGRICULTURE
COMMISSIONER SID MILLER

(800)-Tell-TDA
835-5832

eServices ▾

HOME » NEWS & EVENTS » GRANTS & SERVICES » REGULATORY PROGRAMS » LICENSES & REGISTRATIONS » FOOD & NUTRITION » EDUCATION & TRAINING » REPORTS & PUBLICATIONS » ABOUT » FORMS

Regulatory Programs > Plant Quality > Noxious and Invasive Plants

Noxious and Invasive Plants

What is a Noxious and Invasive Plant

Any plant species that has a serious potential to cause economical or ecological harm to the agriculture, horticulture, native plants, ecology and waterways of Texas.

Process to Add a Plant Species to TDA's Noxious and Invasive Plants List

Resources

🔗 [Contacts](#)

Related Links

🔗 [TDA's Noxious and Invasive Plants Regulations](#)

TDA

Noxious Plants List



Noxious plants

alligatorweed
balloonvine
Brazilian peppertree
broomrape
camelthorn
Chinese tallow tree
Eurasian watermilfoil
giant duckweed
giant reed
hedge bindweed
hydrilla
itchgrass
Japanese dodder
kudzu
lagarosiphon
paperbark
purple loosestrife
rooted waterhyacinth
saltcedar
salvinia
serrated tussock
torpedograss
tropical soda apple
water spinach
waterhyacinth
waterlettuce

Invasive plants

chinaberry
Chinese tallow tree
Japanese climbing fern
kudzu
saltcedar
tropical soda apple



**REPORT NURSERIES SELLING THESE
PLANTS. It is illegal.**

Contact: ARM001@shsu.edu

How to Stop Species from Spreading?

Prevent Transport

- WE aid the spread of invasives
- WE should help prevent the spread of invasives
 - Clean, Drain, Dry



INVASIVE SPECIES HIDE IN YOUR BOAT



CLEAN your boat, trailer and gear by removing all plants, animals and foreign objects.

DRAIN all water from the boat, including the motor, bilge, livewells and bait buckets.

DRY the boat and trailer for a week or more. If unable to let it dry for a week, wash it with a high-pressure washer and hot (140-degree), soapy water.

STATE LAW
REQUIRES THAT YOU DRAIN
ALL WATER BEFORE APPROACHING
OR LEAVING THIS LAKE

www.texasinvasives.org

To report a violation, call 1 (800) 792-4263.



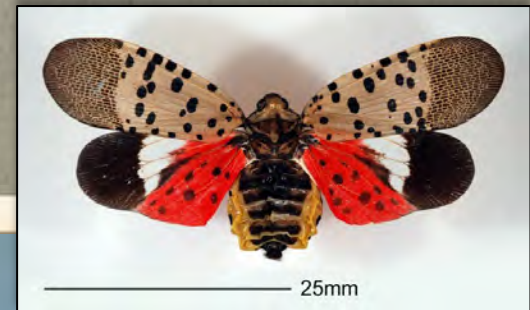
Life's better outside.

UGA0001090

How to Stop Species from Spreading?

Prevent Transport

- WE aid the spread of invasives
- WE should help prevent the spread of invasives
 - Clean, Drain, Dry
 - **Don't Move Firewood**



How to Stop Species from Spreading?

Prevent Transport

- WE aid the spread of invasives
- WE should help prevent the spread of invasives
 - Clean, Drain, Dry
 - Don't Move Firewood
 - Remove seeds/egg casings from boots, clothes
 - CHECK NEW PLANTS

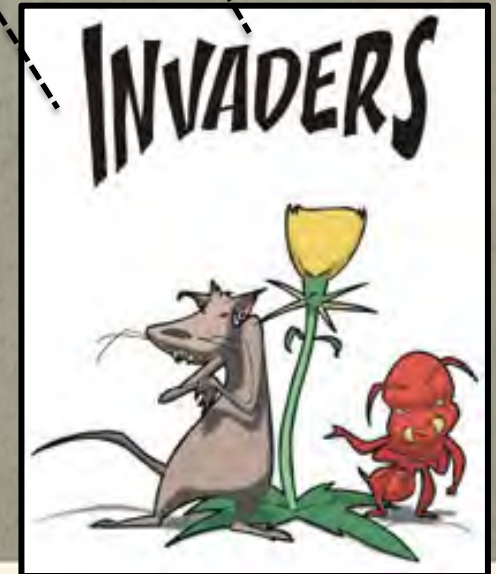


How to Stop Species from Spreading?

Detection

- Trapping
- Monitoring
- **Vigilance**

Texas: **Sentinel Pest Network**



Sentinel Pest Network: Report It!

TEXASINVASIVES.ORG HELLO INVASIVE SPECIES. GOODBYE TEXAS. ABOUT | IWIRE | SPOTLIGHT | CONTACT | ESPAÑOL

INVASIVES 101 TAKE ACTION CITIZEN SCIENTISTS PROFESSIONALS RESOURCES

INVASIVES DATABASE GO

PROTECT THE LAKES YOU LOVE. STOP ZEBRA MUSSELS.

Zebra mussels are having a devastating effect on the state's natural resources. They negatively impact native fish and mussels and foul beaches with their sharp shells. They wreak havoc for boaters by damaging boat hulls and reducing the performance of boating equipment. Zebra mussels can clog water intakes, costing taxpayers millions of dollars. Zebra mussels have already invaded several Texas lakes, and could take over all freshwater sources in Texas.

Do your part to save our lakes – clean, drain and dry your boat every time you leave a lake. [LEARN MORE](#)

SPOTLIGHT Invasive Species News and Events [MORE](#)

DO YOUR PART TO STOP THE SPREAD!



ALERT

GIANT SALVINIA

Salvinia molesta

BRAZIL



ALERT

EMERALD ASH BORER

Agrilus planipennis

EAST ASIA



ALERT

LIONFISH

Pterois volitans

INDO-PACIFIC

INVASIVES 101 **TAKE ACTION**

**DOES NOT
REQUIRE LOGIN!**

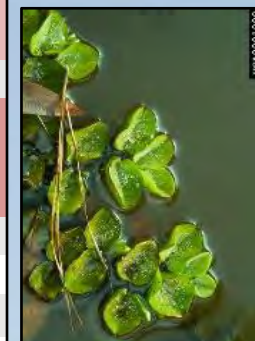


Sentinel Pest Network: Report It!

**DOES NOT
REQUIRE LOGIN!**



A screenshot of the Sentinel Pest Network website. The top navigation bar includes links for 'INVASIVES 101', 'TAKE ACTION' (circled in yellow), 'CITIZEN SCIENTISTS', 'PROFESSIONALS', 'RESOURCES', and 'INVASIVES DATABASE' with a 'GO' button. The main heading is 'TAKE ACTION' in large orange letters. Below this is a vertical menu with options: 'STOP THE SPREAD', 'REPORT IT' (circled in yellow), 'ERADICATOR CALCULATOR', 'SPREAD THE WORD', 'GET INVOLVED', and 'GO NATIVE'. To the right of the menu is a 'REPORT IT' section. It contains a paragraph: 'We need your help to stop the spread of invasive species! Please report any new sightings of the following key invasive species. If possible, take a picture of the plant or pest and record its GPS location.' Below this are three featured species: 'GIANT SALVINIA' (with a photo of green plants), 'EMERALD ASH BORER' (with a photo of a green beetle), and 'ZEBRA MUSSELS' (with a photo of brown mussels). Each species entry includes a brief description and a 'REPORT IT' button. At the bottom left, there is a 'KEEP INFORMED' section with a sign-up form for the iWire and a 'GRAB THE APP' section for the Invaders App.



Common Name	Type of Organism	Category of Animal	In the Original Dirty Dozen?	Currently in Texas?
Apple Snail	Non-insect	Mollusk		Y
Cactus Moth	Insect	Lepidoptera	Y	Y
Soapberry Borer	Insect	Coleoptera		Y
Crested Floating Heart	Plant			Y
Cogongrass	Plant		Y	Y*
Tropical soda apple	Plant		Y	Y*
Gypsy Moth	Insect	Lepidoptera	Y	
Lionfish, Red Lionfish	Non-insect	Fish		Y
Brown Fir Longhorned Beetle	Insect	Coleoptera	Y	Y
Tawny Crazy Ant	Insect	Hymenoptera		Y
Giant African Land Snail	Non-insect	Mollusk	Y	
Tropical Spiderwort	Plant		Y	
Giant Hogweed	Plant		Y	
Spotted Lanternfly	Insect	Hemiptera		
Emerald Ash Borer	Insect	Coleoptera	Y	Y
Giant Salvinia	Plant			Y
Sirex Woodwasp	Insect	Hymenoptera	Y	
Japanese climbing fern	Plant			Y
Zebra Mussels	Non-insect	Mollusk		Y
Brown marmorated stink bug	Insect	Hemiptera		Y
Yellow Floating Heart	Plant			Y
Onionweed	Plant		Y	
Asian Longhorned Beetle	Insect	Coleoptera	Y	
Redbay Ambrosia Beetle	Insect	Coleoptera		Y
Asian Citrus Psyllid	Insect	Hemiptera		Y
Citrus Greening/Huanglongbing	Pathogen	Pathogen		Y
Asian Jumping worms	Non-insect	Annelid		Y



Identification Resources

"The Quiet Invasion"

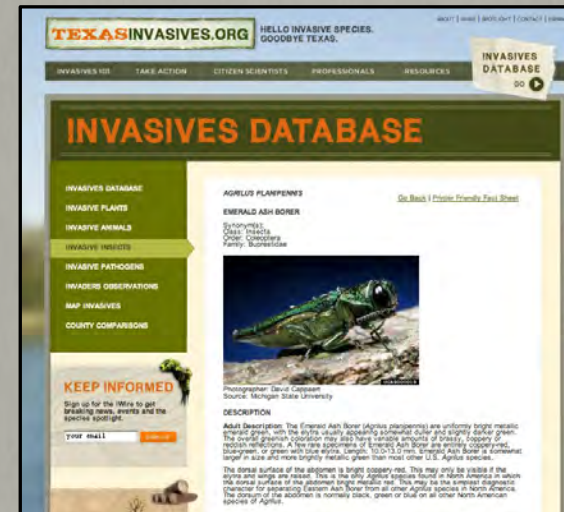
- Lower Galveston Bay Watershed and Upper Texas Coast
- Booklet
- Digital version:
<https://www.galvbayinvasives.org/>
- Produced by HARC

TSUSinvasives.org

- Invasive Species Database

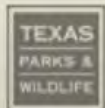
Texasinvasives.org

- Online and mobile app

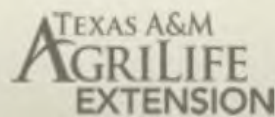


A few Sentinel Pests...

To report and manage in your area



Sam Houston
State University



TEXAS A&M
FOREST SERVICE



THE TEXAS
STATE
UNIVERSITY
SYSTEM™

Redbay Ambrosia Beetle

Introduction & Distribution



Xyleborus glabratus

Native Range: India, Japan, Myanmar, and Taiwan

Primary Transmission: Flight, firewood, wood products

First Detection: Georgia, 2002

Introduced: Solid wood packing material

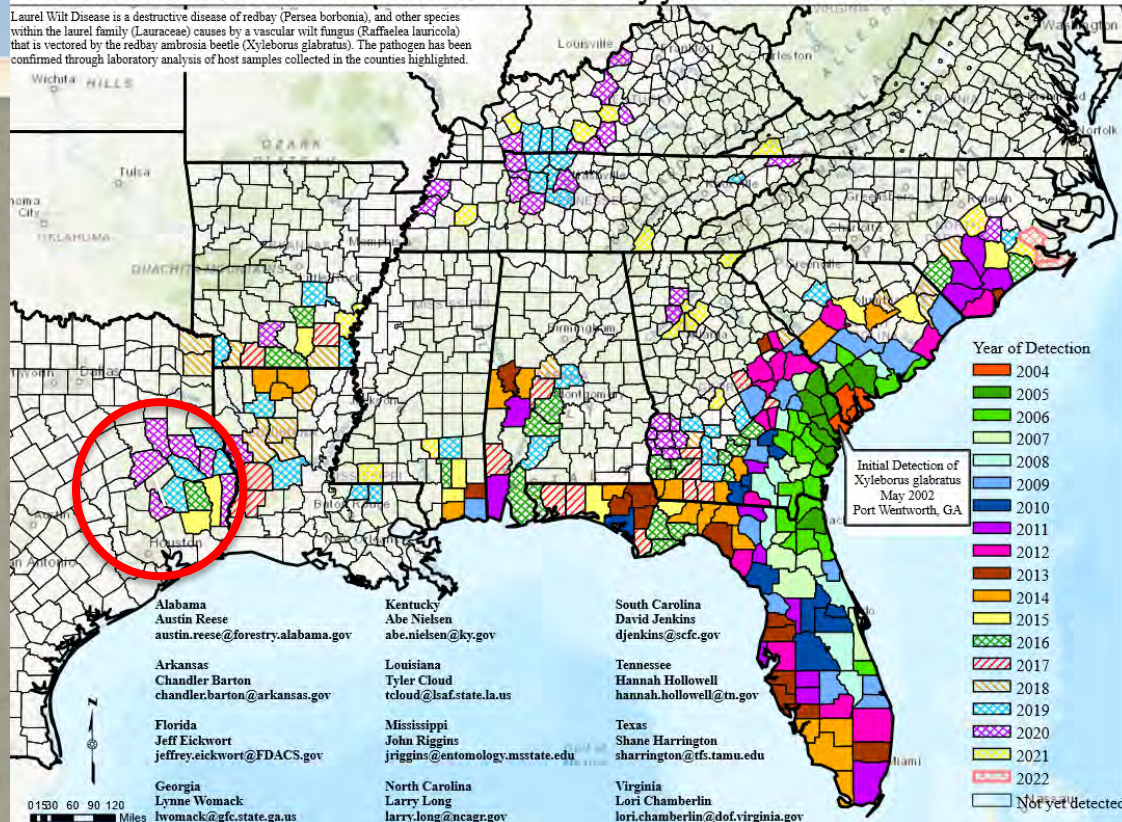
Locations: AL, AR, FL, GA, KY, LA, MS, NC, SC, TN and TX

Expansion into Harris Co. (Kingwood, TX) recorded November 2022!

Distribution of Counties with Laurel Wilt Disease* by year of Initial Detection

February 18, 2022

Laurel Wilt Disease is a destructive disease of redbay (*Persea borbonia*), and other species within the laurel family (Lauraceae) caused by a vascular wilt fungus (*Raffaelea lauricola*) that is vectored by the redbay ambrosia beetle (*Xyleborus glabratus*). The pathogen has been confirmed through laboratory analysis of host samples collected in the counties highlighted.



Redbay Ambrosia Beetle

Host Plants & Characteristics

Infests Laurel trees

Known susceptible species:

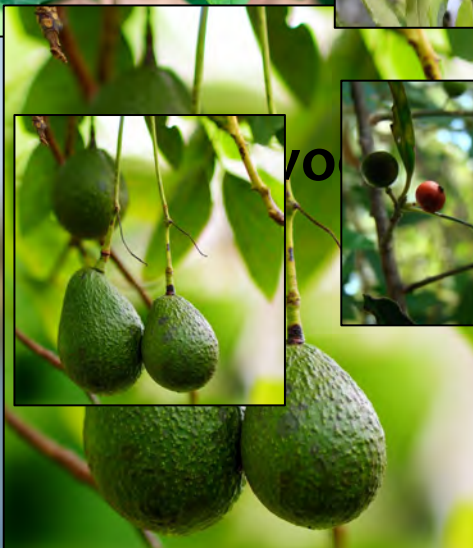
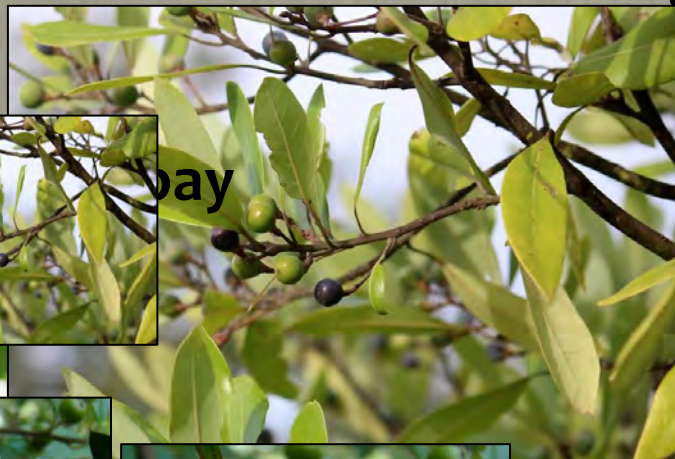
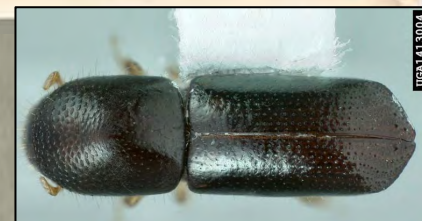
Adults:

• Small!

Dark brown

Looks like other beetles

– How do you tell the difference?



Laurel Wilt

Signs and Symptoms

REPORT IT!

- Leaf wilting and color-change
- Discoloration of the wood. Seen when peeling bark or cutting limbs.
- Death in a few weeks, **must destroy tree quickly after**



Asian Citrus Psyllid

Introduction

Diaphorina citri

Native Range: Southeast Asia

First Detection: Florida 1998 at door/yard citrus plants.

Host Plant: Citrus trees- transmits Citrus Greening disease

Locations: AL, AZ, CA, FL, HI, GA, LA, MS, SC & TX (2012: in San Juan)

Its presence has led to Citrus Quarantines in TX and other states.

USDA ARS Image gallery



Citrus Greening

Introduction

Native Range: Southeast Asia

First Detection: Florida 1998 at door/yard citrus plants.

Host Plant: Citrus trees

Locations: CA, FL, GA, LA, PR, SC & TX (2012: in San Juan)

TX QUARANTINED COUNTIES:

RGV: Brooks, Cameron, Hidalgo, Kenedy, Starr, Webb & Willacy

Coastal Bend: Aransas, Calhoun, Nueces & Kleberg

Gulf Coastal: Brazoria, Galveston, Fort Bend, Harris, Montgomery



**“Don’t Risk
Citrus, Don’t
Move Citrus”
ADHERE TO
QUARANTINES!**

Asian Citrus Psyllid

Identification: Signs & Symptoms

Greatest activity of the psyllid corresponds with the periods of new Citrus growth.

Eggs will be laid at new growth

Nymphs are completely exposed, and their **white waxy excretions** are a strong indicator.



Citrus Greening

Identification: Signs & Symptoms

Most infected trees die within a few years.

- blotchy mottle leaves
- stunted growth
- reduced fruit size
- premature fruit drop
- corky veins
- root decline



Infected trees produce fruits that are green, misshapen and bitter, unsuitable for sale as fresh fruit or for juice.



Citrus Greening Outreach Initiative

PUBLIC EDUCATION: Engaging the public is the best way to make progress in the fight against Invasive Species.

We received USDA-APHIS funding to provide **Citrus Greening and Asian Citrus Psyllid detection.**

- Please contact arm001@shsu.edu to schedule a Workshop or Sampling Effort!
 - Will provide trapping materials
 - Identification of pests
 - In-field starch testing for potential Citrus Greening
 - Molecular confirmation of Citrus Greening at our TISI laboratory



Asian Jumping Worm

Amyntas spp.

Other nicknames: Snake worm, Crazy worm, Alabama jumper.

- Over 400 species worldwide

Arrival: Hitchhiked in imported potted plants

- In the Northeast US since the 1910s.
- NOW invading southwards (found in 20 states)
 - Potentially from movement of potted plants & angler bait.
 - **2022-23 TX REPORTS:** Buda, Conroe, Dallas, Houston, Huntsville & Fort Worth.

Why are they worse than *Lumbricus*?

- They consume ALL organic matter, completely removing all nutrients - severely degrading topsoil.
 - Jumping Worm infestation inhibits seed germination!
 - Also, reach maturity twice as quickly, so they have twice as many generations per season.



Asian Jumping Worms: Soil Damage

Consume ALL organic matter in upper layers of topsoil.

- Leaves soil without the ability to hold moisture or deliver nutrients to plants.
- **EROSION:** Loosens the top layer of soil so much; plants' roots have a hard time hanging on and obtaining the nutrients they need.
- Their digestion changes the appearance of soil. **LOOK FOR "COFFEE GROUND" SOIL**



Asian Jumping Worms: Soil Damage



Sign of jumping worms: “Coffee ground” soil

- Grainy
- Little loose organic matter
- Small slightly compact pieces (worm castings)

Photo credit: Purdue Plant and Pest Diagnostic Laboratory



Uninvaded soil

- Higher ratio of organic matter to “sand”
- Loose organic matter
- No or few small compact pieces

Photo credit: Maria Barnes

Telling the difference



Asian Jumping Worm	European Earthworm
Clitellum is white & flush	Clitellum pink & raised
Dry & Smooth	Slimy & Floppy
Thrashes & jumps around	Undulates and wiggles
"coffee ground" soil	



Prevention and Management



Sam Houston
State University



PARTNERS
TEXAS A&M
AGRI LIFE
EXTENSION



TEXAS A&M
FOREST SERVICE



THE TEXAS
STATE
UNIVERSITY
SYSTEM

Worm, Slug & Flatworm: Prevention

- **LOOKOUT** in soil, potted plants, mulch or compost.
 - **REMOVE SOIL** from all plants before transporting or potting into sterile potting soil. This helps to remove worm cocoons (egg cases) and slug eggs.
- **DO NOT** move any material that might have them.
 - **ESPECIALLY** if you participate in garden club sales/exchanges.
- **DO NOT BUY** worms advertised as jumping worms, “snake worms”, “Alabama jumpers” for any purpose.
- **PLAY, CLEAN, GO:** Leave no trace and clean equipment (gardening, hiking, etc.) before going to another location.
- **DISPOSE** of unwanted bait worms in the trash.
 - **NOT in the water!** They do not drown right away.
 - **NOT into the environment** – Remember, all earthworms are non-native.



Invasive Plant Management

Use an Integrated Pest Management strategy

Treat early and Remove often!

Choose the appropriate management technique:

mechanical

biological

chemical

- License required?
- Read AND FOLLOW label instructions
- Caution near aquatic habitats
- Wear protective gear
- Beware “drift”

Monitor (seed bank/resprout) & Repeat!

Plant Natives!

Check our website for invasive plants

Mechanical

- **Hand pulling**
 - To a certain size
- **Weed wrenching**
 - Effective for medium-sized plants
- **Consistent Mowing**
 - Works only for a few species, with others it **helps them spread quickly**
- **Grazing**
- **Prescribed Fire**
 - Effective on rangeland
 - Limited by fire bans
- **Tree Girdling**
 - Strip the upper bark layer
 - **Exposes phloem (inner bark).**
 - **Cliff Tyllick on YouTube**



Chemical

- **Follow all labels and directions**
- **Do not overuse & only use when needed**
- **BE SELECTIVE**

USE PESTICIDES WISELY: ALWAYS READ THE ENTIRE PESTICIDE LABEL CAREFULLY, FOLLOW ALL MIXING AND APPLICATION INSTRUCTIONS AND WEAR ALL RECOMMENDED PERSONAL PROTECTIVE GEAR AND CLOTHING. CONTACT YOUR STATE DEPARTMENT OF AGRICULTURE FOR ANY ADDITIONAL PESTICIDE USE REQUIREMENTS, RESTRICTIONS OR RECOMMENDATIONS. MENTION OF PESTICIDE PRODUCTS ON THIS WEB SITE DOES NOT CONSTITUTE ENDORSEMENT OF ANY MATERIAL.

Cut and Treat



Direct Foliar Spray



Basal Spray



Hack-n-Squirt



The most important step...

The Rehabilitation Phase

- **Do not just cut down invasive plants! They will regrow!**
 - Replanting and reseeding native species is vital to keep down re-sprouting invasives and prevent soil from washing out.



American Beauty Berry



Native Sea oats



Eastern Redbud

Invasive Insect Prevention

Monitor (seed bank/resprout) & Repeat!

Plant Natives!

Check our website for invasive plants

THINK about which plants you bring home.

Exotic plants can host exotic pests



Trees destroyed by ANY bark beetle (native or invasive)

Remove trees ASAP!!

Do not keep it for firewood!

Do not share with neighbors!

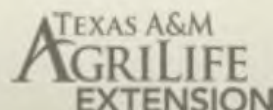
Mulch & bag before disposal (BURN, if possible)



Connections, Collaborations, Presentations & Invasives Removal *with Texasinvasives.org*



Sam Houston
State University



TEXAS A&M
FOREST SERVICE



THE TEXAS
STATE
UNIVERSITY
SYSTEM™

Connection, Collaboration & Invasives Removal

Connection

Texasinvasives.org has established connections with state, federal and local groups. Connection is vital in the fight against Invasives.

- Local groups want to volunteer, love removing invasives and want to support or collaborate with larger entities.

We can help!

Collaboration & Advertising

Sometimes we do not have funding to host events, but we are always willing to collaborate with time, effort and advertising.

Presentations

Public education is paramount, we will present to your group on Invasive Species. **You pick the topic!**

Keep on Removin'!

REMOVAL DAYS: Groups with organized removal plans really make an impact!



Keep on Removin'!

REMOVAL DAYS: Groups with organized removal plans really make an impact!
TX Gulf Region CWMA: Brazilian Peppertree removal & Biocontrol, Port Aransas



Keep on Removin'!

REMOVAL DAYS: Groups with organized removal plans really make an impact!

Texas Gulf Region CWMA: Brazilian Peppertree removal, Port Aransas

The Woodlands Taskforce: Air Potato Removal & Biocontrol Program (w/ USDA-APHIS)



Keep on Removin'!

REMOVAL DAYS: Groups with organized removal plans really make an impact!

Texas Gulf Region CWMA: Brazilian Peppertree removal, Port Aransas

The Woodlands Taskforce: Air Potato Removal & Biocontrol Program (w/ USDA-APHIS)

Alamo Master Gardeners: 2000 Apple Snails removed at Riverwalk (approval from S.A.R.A.)



Keep on Removin'!

REMOVAL DAYS: Groups with organized removal plans really make an impact!

Texas Gulf Region CWMA: Brazilian Peppertree removal, Port Aransas

The Woodlands Taskforce: Air Potato Removal & Biocontrol Program (w/ USDA-APHIS)

Alamo Master Gardeners: 2000 Apple Snails removed at Riverwalk (approval from S.A.R.A.)

LaPorte Park System: Apple Snail removal with TISI, 200 lbs. removed.



Keep on Removin'!

REMOVAL DAYS: Groups with organized removal plans really make an impact!

Texas Gulf Region CWMA: Brazilian Peppertree removal, Port Aransas

The Woodlands Taskforce: Air Potato Removal & Biocontrol Program (w/ USDA-APHIS)

Alamo Master Gardeners: 2000 Apple Snails removed at Riverwalk (approval from S.A.R.A.)

LaPorte Park System: Apple Snail removal with TISI, 200 lbs. removed.

TPWD: Healthy Creeks, Giant Reed removal on private land along 5 rivers in Central TX

PULL, KILL, PLANT
Strategy



Stay informed with our monthly iWire!

TAKE ACTION

STOP THE SPREAD

REPORT IT

ERADICATOR CALCULATOR

SPREAD THE WORD

GET INVOLVED

GO NATIVE

KEEP INFORMED

Sign up for the iWire to get breaking news, event info and the species spotlight.

SIGN UP



STOP THE SPREAD

There are many things you can do to help stem the tide of invasive species. One of the most effective ways to manage invasive species is for recreationalists such as boaters, fishermen, pet owners, and gardeners to Take Action. Here are some easy everyday things you can do to meet the Invasive Species Challenge:

BOATERS AND ANGLERS

You can "[Stop Aquatic Hitchhikers](#)" by following these tips for preventing the transportation of aquatic invasive species:

- CLEAN, DRAIN AND DRY YOUR BOAT, TRAILER AND GEAR EVERY TIME YOU LEAVE A BODY OF WATER!

Submitting Invasive Species reports on [Texasinvasives.org](https://texasinvasives.org)



Sam Houston
State University

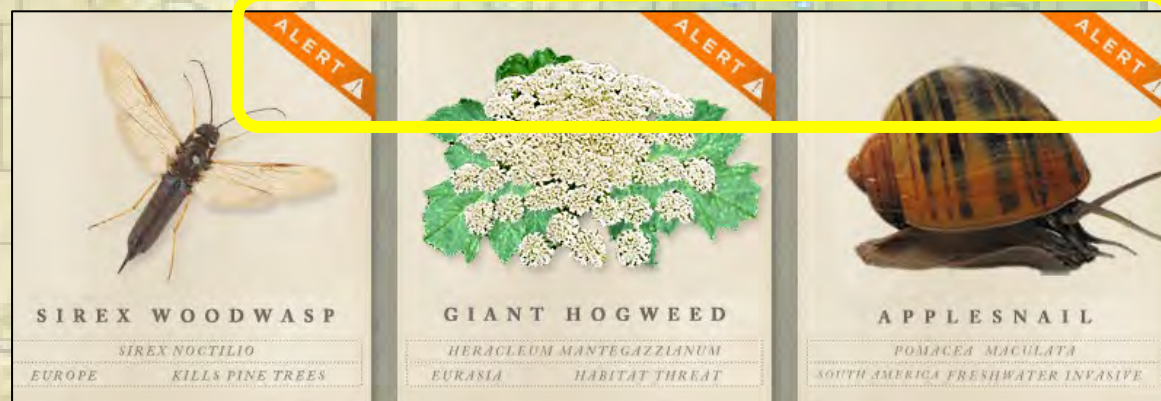
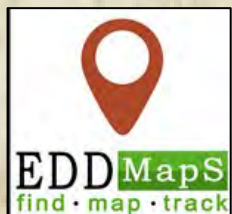


TEXAS A&M
FOREST SERVICE



THE TEXAS
STATE
UNIVERSITY
SYSTEM™

WHY should I report to Texasinvasives.org?



Data collected is sent **DIRECTLY** to our
federal and state partners!

No searching through iNaturalist for
important invasive species needed... you can
help us alert them **ASAP**

Reporting Invasive Species Sentinel Pest Network

TEXASINVASIVES.ORG

Click species to **REPORT IT!**



TEXASINVASIVES.ORG
HELLO INVASIVE SPECIES.
GOODBYE TEXAS.

[ABOUT](#) | [IWIRE](#) | [SPOTLIGHT](#) | [CONTACT](#) | [ESPA](#)

[INVASIVES 101](#)
[TAKE ACTION](#)
[CITIZEN SCIENTISTS](#)
[PROFESSIONALS](#)
[RESOURCES](#)

INVASIVES DATABASE
GO

PROTECT THE LAKES YOU LOVE. STOP ZEBRA MUSSELS.

Zebra mussels are having a devastating effect on the state's natural resources. They negatively impact native fish and mussels and foul beaches with their sharp shells. They wreak havoc for boaters by damaging boat hulls and reducing the performance of boating equipment. Zebra mussels can clog water intakes, costing taxpayers millions of dollars. Zebra mussels have already invaded several Texas lakes, and could take over all freshwater sources in Texas.

Do your part to save our lakes – **clean, drain and dry** your boat every time you leave a lake. [LEARN MORE](#)

SPOTLIGHT
Invasive Species News and Events
[MORE](#)

**DO YOUR PART TO
STOP THE SPREAD**

ALERT

ALERT

ALERT

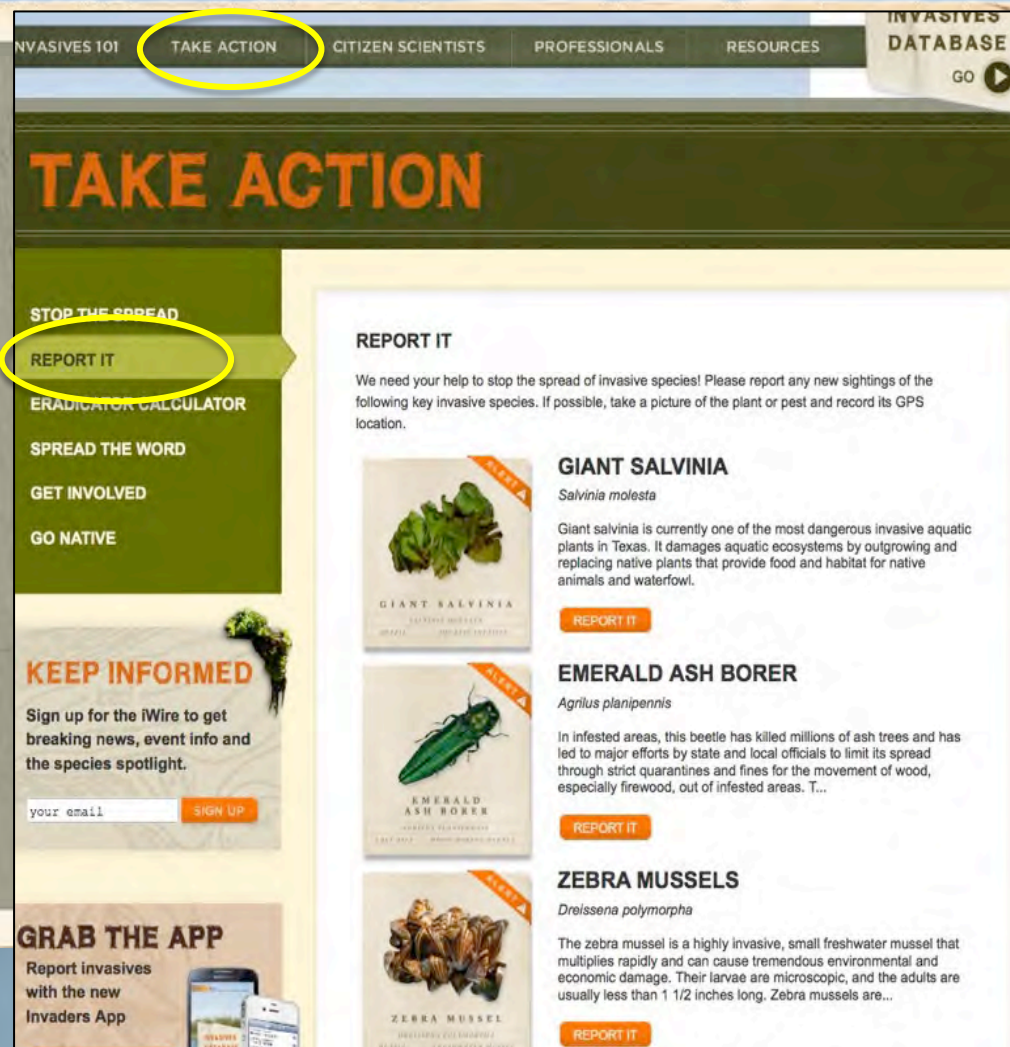
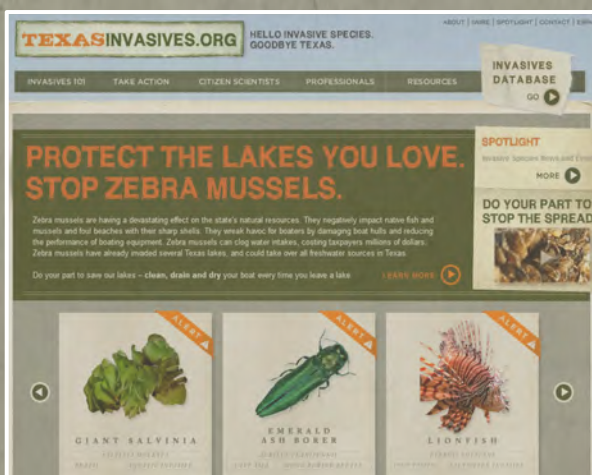
GIANT SALVINIA
SALVINIA MOLESTA
TROPICAL AQUATIC INVASIVE

EMERALD ASH BORER
AGRILUS PLANIPENNIS
EAST ASIA WOOD BORING BEETLE

LIONFISH
PTEROIS VOLITANS
INDO-PACIFIC SALTWATER INVASIVE

Reporting Invasive Species Sentinel Pest Network

Or click **TAKE ACTION** tab and **REPORT IT** to scroll to the species.



Reporting Invasive Species Sentinel Pest Network

TAKE ACTION

REPORT IT

We need your help to stop the spread of invasive species! Please report any new sightings of the following key invasive species. If possible, take a picture of the plant or pest and record its GPS location.

GIANT SALVINIA
Salvinia molesta

Giant salvinia is currently one of the most dangerous invasive aquatic plants in Texas. It damages aquatic ecosystems by outgrowing and replacing native plants that provide food and habitat for native animals and waterfowl.

REPORT IT

EMERALD ASH BORER
Agrilus planipennis

In infested areas, this beetle has killed millions of ash trees and has led to major efforts by state and local officials to limit its spread through strict quarantines and fines for the movement of wood, especially firewood, out of infested areas. T...

REPORT IT

PROTECT THE LAKES YOU LOVE. STOP ZEBRA MUSSELS.

Zebra mussels are having a devastating effect on the state's natural resources. They negatively impact native fish and mussels and foul beaches with their sharp shells. They wreak havoc for boaters by damaging boat hulls and reducing the performance of boating equipment. Zebra mussels can clog water intakes, costing taxpayers millions of dollars. Zebra mussels have already invaded several Texas lakes, and could take over all freshwater sources in Texas.

Do your part to save our lakes – clean, drain and dry your boat every time you leave a lake. **LEARN MORE**

SPOTLIGHT
Invasive Species News and Events
MORE

DO YOUR PART TO STOP THE SPREAD

ALERT 4
GIANT SALVINIA
Salvinia molesta
AQUATIC INVASIVE

ALERT 4
EMERALD ASH BORER
Agrilus planipennis
WOOD BORING BEETLE

ALERT 4
LIONFISH
Pterois volitans
SALTWATER INVASIVE



<https://linktr.ee/texasinvasives>



Gathering Data

Tips for Taking Pictures


- Remember: pictures are used for validation
 - Only **one picture can be submitted** so make it count
- Close-ups if possible
 - In focus!
- Prefer landscape orientation
- Capture characteristics that help to identify the species
- **A contrasting background is very helpful!**

Sentinel Pest Network: Report It!

Location

Latitude: Longitude: in decimal degrees

Map **Satellite** **TEXAS**



Map data ©2020 Google, INEGI Terms of Use Report a map error

Latitude: 30.141550149493376 Longitude: -98.05531203125001

Texas A&M University Forest Service Emerald Ash Borer site

REPORT FORM

If you have spotted *Agrilus planipennis* (Emerald Ash Borer), use this report form to send an email to the appropriate authorities.

Your Name

Email

Phone Number

Street Address

City

County

Zip Code

Location

Latitude: Longitude: in decimal degrees

Did You Collect a Specimen?

☐ Yes or No.

Host Plant

 If applicable, what is the host plant?

Comments: Describe the species, impact, infestation or generally what you are seeing.

Please upload a photo of the specimen or the site where the specimen was seen. **NOTE: The photo file must be no larger than 2 MB in size.**

no file selected

Stop the Spread!

Resources



Invasive Species Info & Management at:
texasinvasives.org or TSUSinvasives.org



Report Sentinel pests via:
texasinvasives.org

Other sightings:
invasives@shsu.edu

Citrus Sampling or
Invasive Workshop:
arm001@shsu.edu

