Lady Bird Johnson Wildflower center The University of Texas at Austin

Invaders of Texas
a Citizen Science program of the Lady Bird Johnson Wildflower Center

TEXASINVASIVES.ORG

Invasive Species and the Managed Landscape

January 20, 2017
Grow Green

Hans Landel, Ph.D.
Invasive Species Program Coordinator
Lady Bird Johnson Wildflower Center

PARTNERS

Texas Parks & Wildlife · Lady Bird Johnson Wildflower Center · USDA · Texas A&M AgriLife Extension · APHIS · Sport Fish Restoration · Texas A&M Forest Service

TODAY

- **General Concepts and Background**
  - What Is an Invasive Species?
  - How Do Invasive Species Spread?
- **Invasives and Horticulture**
- **Tools for Assessing Invasiveness of a Landscape Plant**
- **LBJ Wildflower Center Invasives Program**
  - The Invaders of Texas Citizen Scientist Program
  - The Sentinel Pest Network
  - TIPPC

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)

What Is an Invasive Species?

Are All Non-native Species Invasive?

Not All Exotics Are Invasive

- 98% U.S. agricultural crops are non-native
- **Remember:** *Must Cause Harm*

How Exotics Become Invasive

- Become *naturalized*
- Spread (more on this later)

"How" Example: Ornamental Plants

1: http://static6.businessinsider.com/image/4d6fea5fcadcbb2f40260000/wheat-and-corn-prices-are-surging-after-one-of-the-most-critical-crop-reports-of-the-year.jpg

2: http://www.hatchettcreek.com/wp-content/uploads/2015/07/Ligustrum-Japonica.jpg

3: http://freedomlouisiana.org/wp-content/uploads/privet.jpg

What Is an Invasive Species?

Other terms:

Non-native

Exotic

Introduced

ALIEN

"Weed"

Why Do We Battle Invasive Species?

Recall

Invasive species → **HARM**

- Environment
- Recreation/Social
- Human Health
- Animal Health
- Economy

Invasive Species: Harm

Environmental

- **Genetic & Individual Impacts:**
  - Hybridize with native species
  - Changes in morphology
  - Changes in behavior
- **Population Impacts:**
  - Competition
  - Predation
  - Nutrition
  - Physical
  - Diseases
- **Community Impacts:**
  - Species composition
  - Lower biodiversity
  - Species interactions
  - Extinction
- **Impacts on Ecosystem Function:**
  - Fire regimes
  - Soil health
  - Hydrology
  - Erosion
  - Aquatic nutrients

Invasive Species: Harm

Economic

- Invasives management and control
- Damage repair
- Maintenance costs
- Agricultural, fisheries, forest losses
- Tourism losses
- Losses in ecosystem functions

Human Health

- Allergies
- Injury/disease
- Pesticide and herbicide application

Social/Recreational

- Sport fishing & boating
- Aesthetics & Outdoor activities

[2]USFS

[4]http://el.erdc.usace.army.mil/zebra/zmis/zmishelp/impacts_on_federal_state_and_municipal_facilities.htm


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Wildflowercenter
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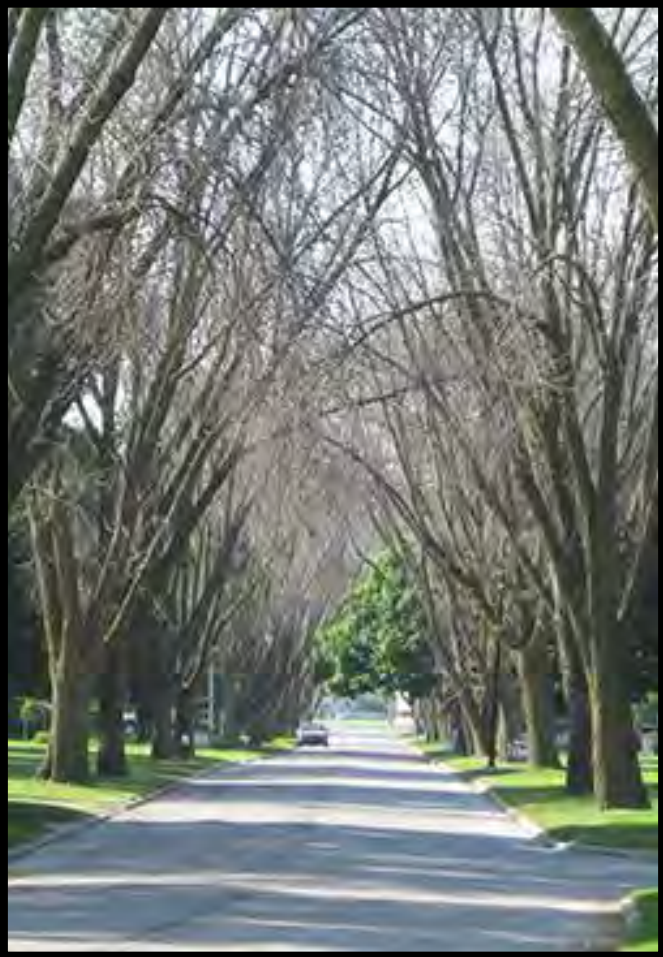
Emerald Ash Borer Damage

June 2006
Credit: D. Herms

(Ohio)



August 2009
Credit: D. Herms

http://www.americanforests.org/magazine/article/will-we-kiss-our-ash-goodbye/


Chinese Privet
(Ligustrum sinense)
Competes for pollinators
Replaces natives
Competes for seed dispersers
Changes soil chemistry and nutrient cycling
Negative impacts on mycorrhizal fungi community
Impacts on stream communities
Soil arthropod community
© James H. Miller

Why Do We Battle Invasive Species?

Recall

Invasive species

HARM

SPREAD

Increase in population size

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**

[1]National Health Museum, 2009 [2]Alan Vernon, Fliker

How Invasive Species Spread

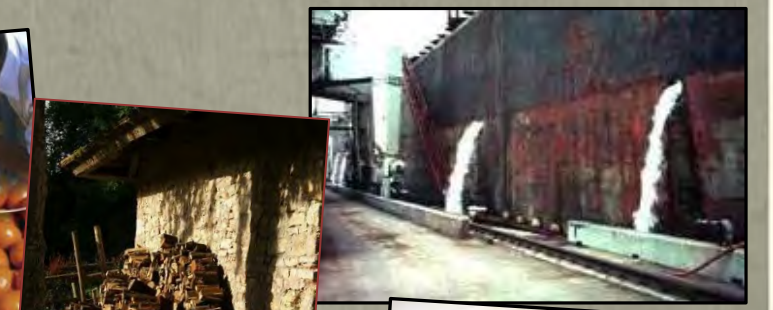
- **Natural Dispersal**
  - **Production of offspring**
    - **Wind- or water-borne seeds or larvae**
    - **Animal-borne seeds or larvae**
  - **Movement of adults**
    - **Swim, fly, walk/run**
  - **Can't always explain expansion**

- **With Human Assistance**

How Invasive Species Spread

With Human Assistance

- **Accidental**
  - Produce
  - Nursery stocks
  - Ship ballasts
  - Packing materials & shipping containers
  - Recreational travelers
  - Hay
  - Flowers
  - Mowing practices
  - Vehicles
  - Firewood
  - Boots and gear

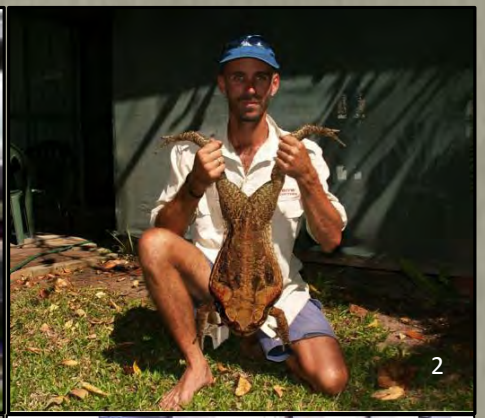



[1]XXXXXXXXXXX [2]XXXXXXX [3]Aelwyn Fliker 2007

How Invasive Species Spread

With Human Assistance

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



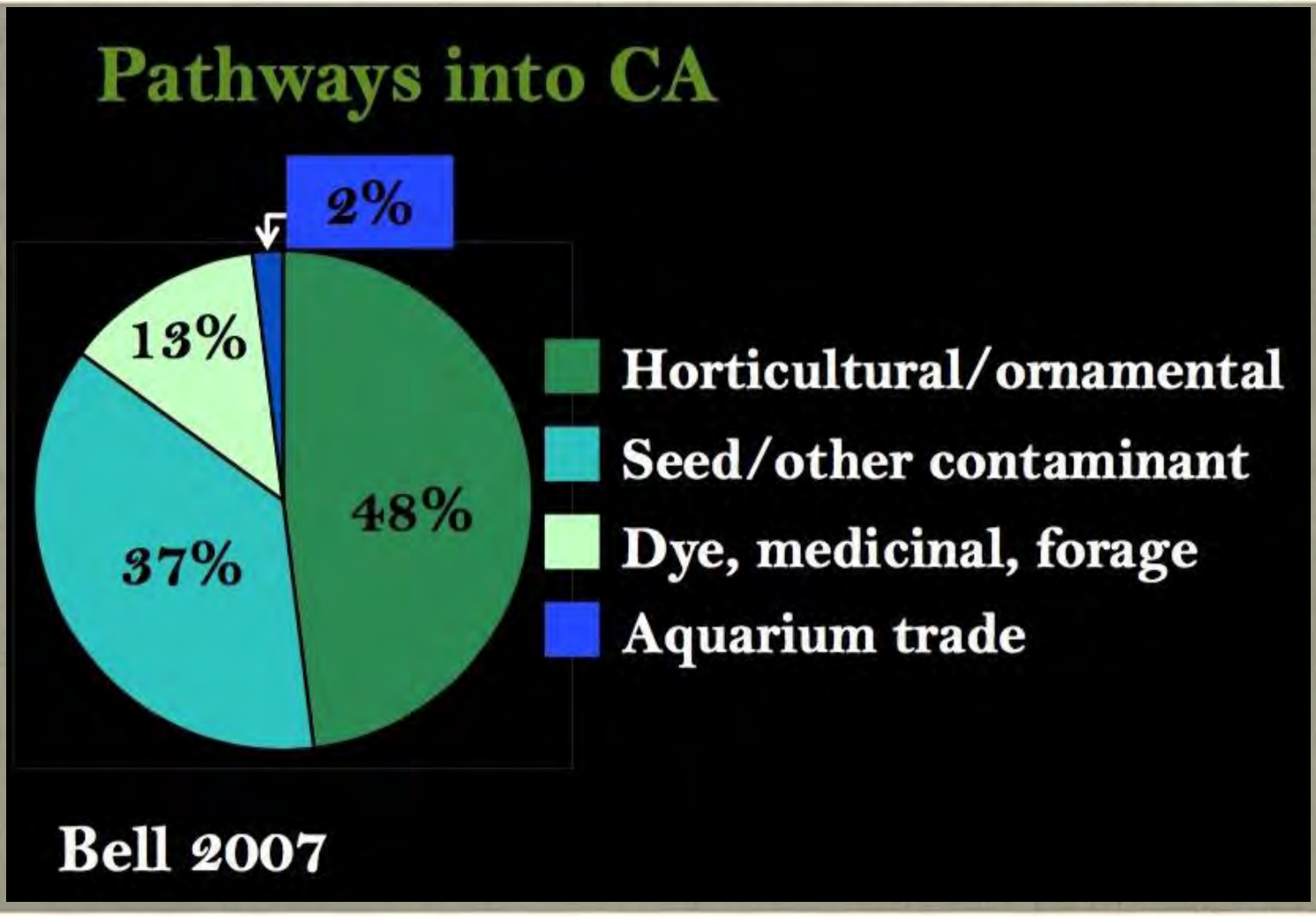
[1]Aelwyn Fliker 2007 [2]http://io9.com/5833022/10-of-the-worlds-worst-invasive-species
[3]http://www.eddmaps.org/ipane/ipanespecies/shrubs/Rosa_multiflora.htm [4]Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Characteristics of a Useful Landscape Plant

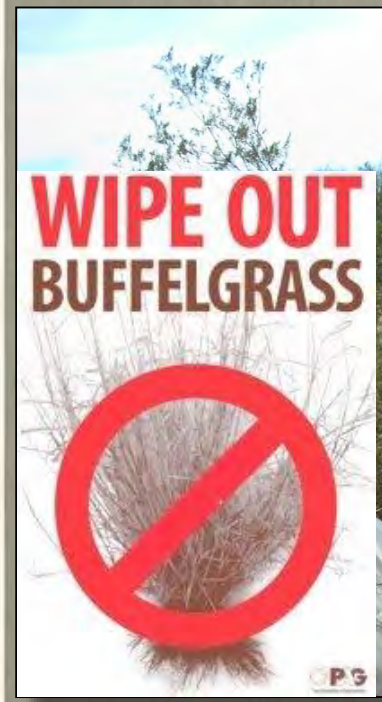
- Easy to propagate
  - Lots of seeds
  - Good seed viability
  - High germination success
  - Asexual propagation
  - Grows fast
- Easy to Grow and Care For
  - Hardy
  - Grows fast
  - Few/no pests, diseases
  - Habitat generalist
  - Water-wise
- Beauty/Interest
  - Good color
  - Bright berries

Characteristics of Invasiveness!

Routes of Introduction of Invasive Plants

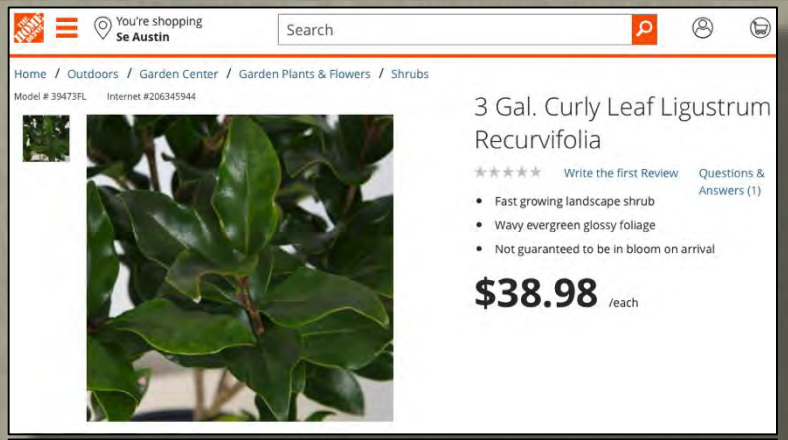


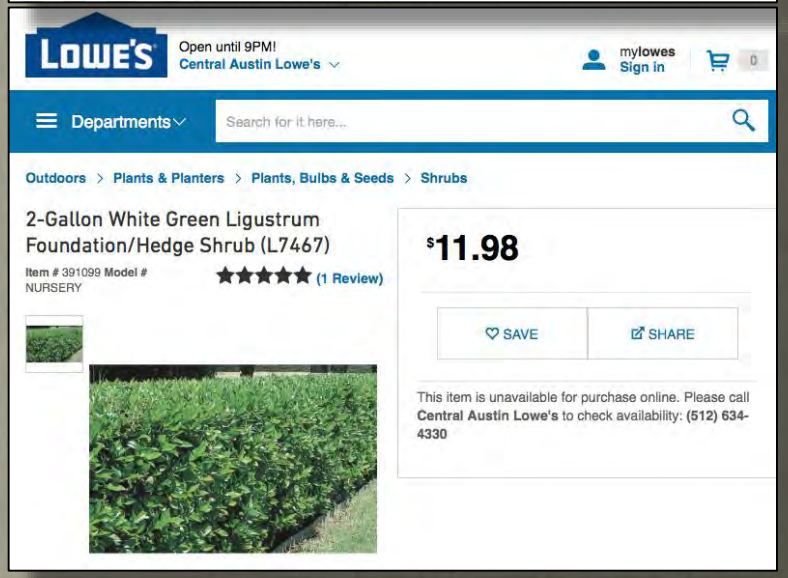
Invasive Species: Contradictions



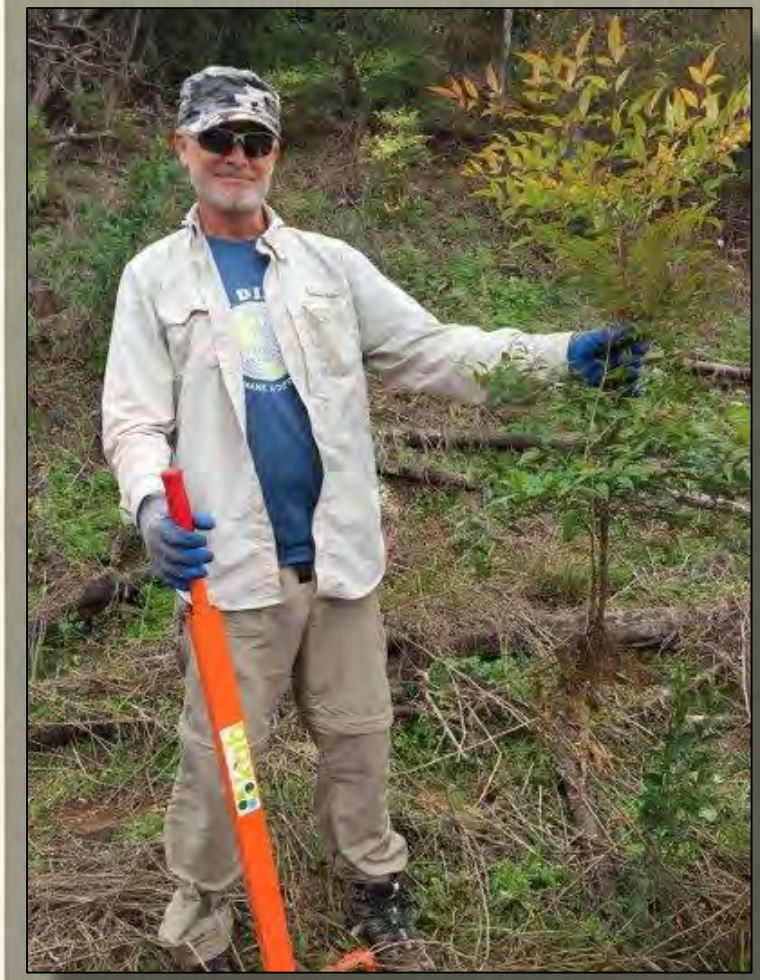
Invasive Species: Contradictions

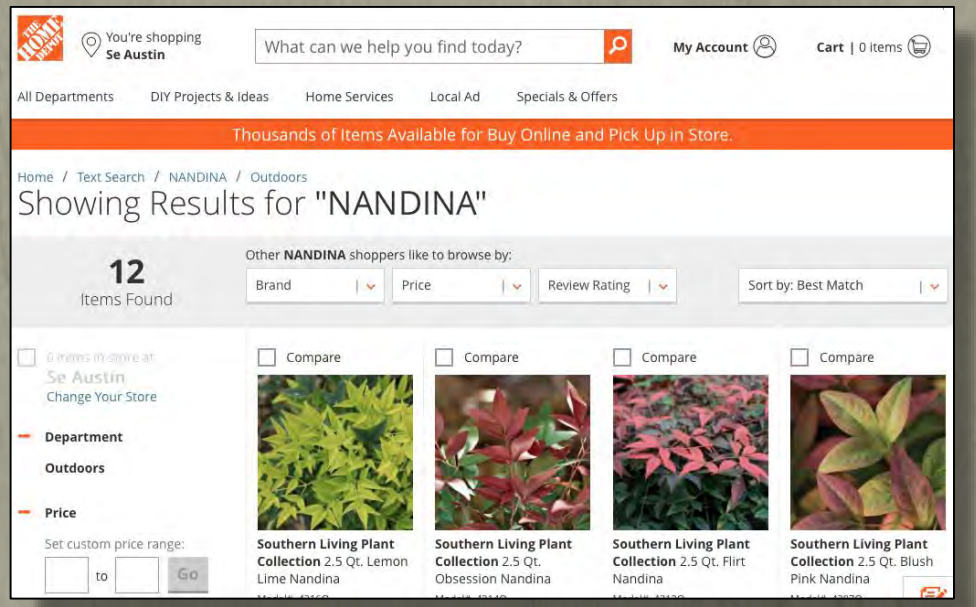
Georgia Wildlife Federation





Invasive Species: Contradictions





Keep Austin Beautiful

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HELLO INVASIVE SPECIES.
GOODBYE TEXAS.

Tools

PARTNERS

TEXAS PARKS & WILDLIFE

Wildflower center

TEXAS A&M AGRILIFE EXTENSION

APHIS

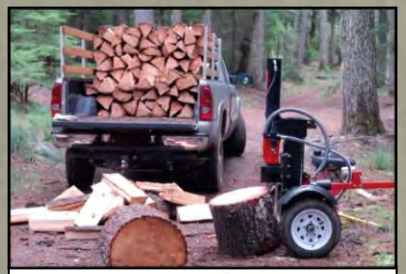
SPORT FISH RESTORATION

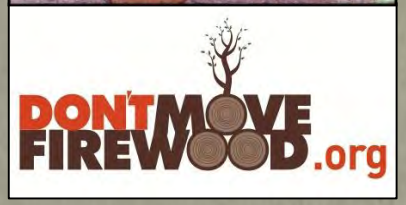
TEXAS A&M FOREST SERVICE

How to Stop Species from Spreading?

Prevent Transport

- WE aid the spread of invasives
- WE can help prevent the spread of invasives
  - Clean, Drain, Dry
  - Don't Move Firewood
  - Remove seeds from boots, clothes
  - Plant Natives





Texasinvasives.org

- A partnership between the Texas Forest Service, USDA-APHIS, Texas Parks and Wildlife Department, and others.
- Designed to present a coordinated approach to address invasive species throughout Texas.

Goals

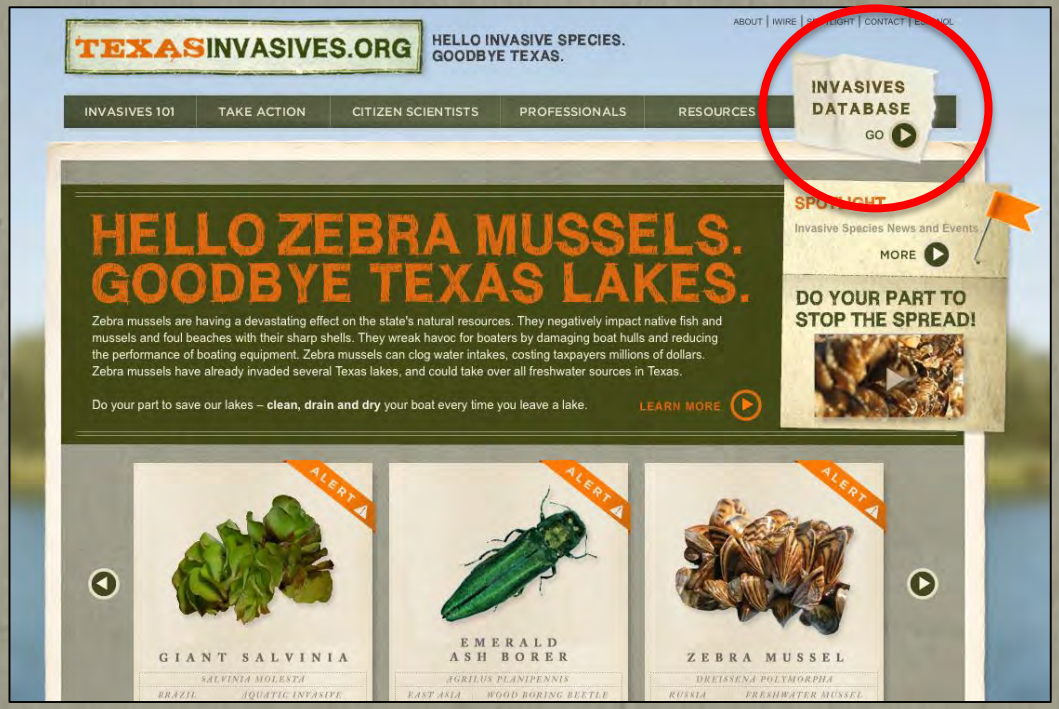
- **Facilitate communication** among the state's invasive species stakeholders
- **Implement a coordinated response** to address invasive species issues on a statewide level
- Provide a venue for **sharing information** about key invasive strategies
- Create **public awareness** of the problems posed by invasive species in Texas

PARTNERS

Texasinvasives.org

Invasives Database

- Illustrated Descriptions
- Ecological Information
- Distribution & Habitat
- Biology & Spread
- History of Introduction
- Ecological Threats
- Control & Management
- Native Look-a-likes
- Native Alternatives
- References



Horticultural Code of Practice

All Users

- Dispose of plant waste responsibly
- Know exactly what you are growing and buying
- Take advice on the best control techniques
- Control invasive non-native plants safely
- Be aware of relevant legislation

Suppliers and retailers

- Know what you are supplying or selling; label plants clearly and accurately
- Provide substitutes for invasive plants
- Provide advice on disposal

Buyers and Importers

- Beware of hitch-hiking pests on plants and in soil

Department for Environment, Food and Rural Affairs (UK)
2011

Weed Risk Assessment

Assessments of a plant's potential to be invasive

- **USDA-APHIS**

https://www.aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs/pests-and-diseases/sa_weeds/sa_noxious_weeds_program/ct_riskassessments

- **States**
  - **Texas**

http://www.texasinvasives.org/professionals/assessment.php

USDA

Weed Risk Assessment for *Ligustrum sinense* Lour. (Oleaceae) – Chinese privet

United States Department of Agriculture

Animal and Plant Health Inspection Service

September 18, 2012

Version 1

APHIS

Infestation of *L. sinense* (source: John D. Byrd, Mississippi State University, Bugwood.org).

Agency Contact:

Plant Epidemiology and Risk Analysis Laboratory
Center for Plant Health Science and Technology

Plant Protection and Quarantine
Animal and Plant Health Inspection Service
United States Department of Agriculture
1730 Varsity Drive, Suite 300
Raleigh, NC 27606

Figure 2. *Ligustrum sinense* risk score (black box) relative to the risk scores of species used to develop and validate the PPQ WRA model (other symbols). See Appendix A for the complete assessment.

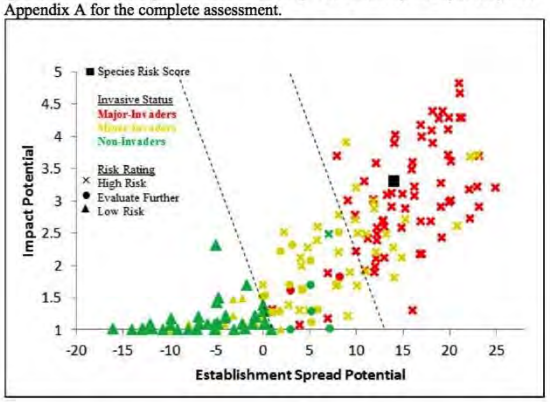
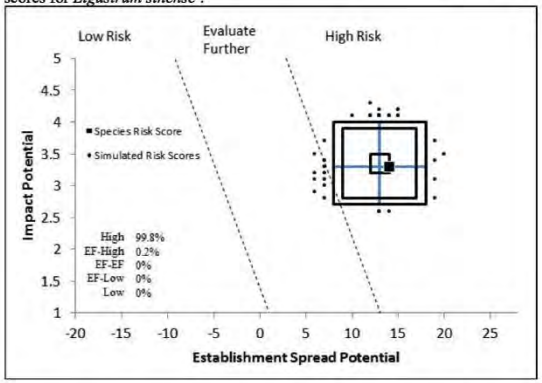


Figure 3. Monte Carlo simulation results (N=5,000) for uncertainty around the risk scores for *Ligustrum sinense*[a].



[a] The blue "+" symbol represents the medians of the simulated outcomes. The smallest box contains 50 percent of the outcomes, the second 95 percent, and the largest 99 percent.

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HELLO INVASIVE SPECIES.
GOODBYE TEXAS.

ABOUT | IWIRE | SPOTLIGHT | CONTACT | ESPANOL

INVASIVES 101 | TAKE ACTION | CITIZEN SCIENTISTS | PROFESSIONALS | RESOURCES

INVASIVES DATABASE GO

PROFESSIONALS

- WELCOME PROFESSIONALS
- TIPPC
- STATE CONFERENCE
- ABSTRACT DATABASE
- CONTROL & MANAGEMENT
- INVASIVE PLANT INVENTORY
- CWMAS & CISMAS

PROFESSIONALS

In this section we provide information for stakeholders who have a professional interest in invasive species in Texas. It contains information about the Texas Invasive Plant & Pest council (TIPPC), the statewide Invasive Species Conference, abstracts from past conferences and Species Assessments.

WHO ARE THE PROFESSIONALS?

Land management specialists from local, state, and federal agencies, including municipal, regional, state and federal parks.

Environmental organizations such as The Nature Conservancy, Native Plant Society, Audubon, Land Conservancies, Land Trusts, etc.

SUPPORT TIPPC

Donate to support the Texas Invasive Plant & Pest Council

Donate

Our Focus
Program Overview
Pests and Diseases
Import into the U.S.
Export from the U.S.
International
Manuals

Noxious Weeds Program Risk Assessments

Last Modified: Dec 9, 2016

Print

PPQ conducts weed risk assessments (WRA) as part of its process for safeguarding U.S. agriculture and natural resources from weeds and invasive plants. A weed risk assessment is a science-based evaluation of the potential of a plant species to establish, spread, and cause harm in the United States. PPQ may initiate an assessment for any number of reasons, including: evaluation of commodity import requests, detection of a new weed in the United States, and petitions for listing from stakeholders.

Below is a list of the available WRAs that PPQ has conducted. They are provided for interested stakeholders and may be useful in setting local policies or for informing resource managers. While most of the risk assessments were prepared by PPQ using our current weed risk assessment process [see Guidelines document below], others

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PROMOTING NONINVASIVE PLANTS FOR CALIFORNIA

PLANT RIGHT

- About Us
- Invasive Plants & Alternatives
- PlantRight's Projects
- How to Help
- Resources

Email:

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Log in

Create new account
Request new password

Invasives Where You Live

Which plants are invasive in your area of California? Find out here

Retail Nursery Partners

California Retail Nurseries:
Join us today!

PLANT RIGHT PARTNER

Or, find a PlantRight Partner near you

Invasives 101

Get the facts on invasive plants
Continuing Education
Impacts | Research | Spread the word

Contact Us | Website feedback | Site by IBD and FILA Design

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Invasive Plant Atlas of the United States

Home | About

Google™ Custom Search

Home | Aquatics | Grasses | Herbs/Forbs | Shrubs/Subshrubs | Trees | Vines | All Species | Images | Parks | Sources

Invasive Plant Atlas Logo

Non-native invasive species are organisms that have been introduced by humans either purposely or by accident and that have become serious environmental pests. One reason for their success as pests is that they are typically introduced without the array of associated natural controls (herbivores, parasites, pathogens, predators) that occur in their native range. In addition to the great loss of biodiversity, habitat degradation and other ecological consequences, invasive species cause huge economic damages valued in billions of dollars annually and some pose a human health threat.

Invasive alien plants threaten native species and habitats by competing for critical and often limited resources like sunlight, water, nutrients, soil and space. They succeed through vigorous growth, prolific reproductive capabilities and by causing changes that favor their growth and spread. Invasive plant species displace and alter native plant communities, impede forest regeneration and natural succession, change soil chemistry, alter hydrologic conditions, alter fire regimes, cause genetic changes in native plant relatives through hybridization and some serve as agents for the transmission of harmful plant pathogens.

The Invasive Plant Atlas of the United States is a collaborative project between the National Park Service, the University of Georgia Center for Invasive Species and Ecosystem Health, the Invasive Plant Atlas of New England and the Lady Bird Johnson Wildflower Center. The purpose of the Atlas is to assist users with identification, early detection, prevention, and management of invasive plants. The focus is on non-native invasive plant species impacting natural areas, excluding agricultural and other heavily developed and managed lands. Four main components are species information, images, distribution maps, and early detection reporting procedures. The Invasive Plant Atlas is one step in the effort to combat invasive species, preserve our natural landscapes and the native plants, animals, and other creatures that inhabit them.

Invasive Species News

- The People Have Spoken: Using Forest and Firewood National Polling Data to Promote Forest Health
- APHIS Adds Forty-four Counties in Georgia to the Emerald Ash Borer Regulated Area
- Spread by trade and climate, bugs butcher America's forests
- Executive Order -- Safeguarding the Nation from the Impacts of Invasive Species
- Invasive Insects Cost the World How Much?!
- Thoughts from the International Congress of Entomology 2016
- No-Till Agriculture Results in Greater Soil Microbe Biomass
- Pollinators Threatened by Invasive Plants
- Whole Foods is selling invasive lionfish in Florida
- The usefulness, value and utility of BugwoodImages is demonstrated in the April 2016 Issue of "IPM Insights", the Newsletter of the Northeastern (USA) IPM Center
- More News

Texas Parks and Wildlife Prohibited Aquatic & Exotic Species

TITLE 31. NATURAL RESOURCES AND CONSERVATION. Part 2. TEXAS PARKS AND WILDLIFE DEPARTMENT. Chapter 57. FISHERIES. SUBCHAPTER A. HARMFUL OR POTENTIALLY HARMFUL FISH, SHELLFISH, AND AQUATIC PLANTS

§57.111. Definitions.

N= 19 species

Botanical Name - Common Name

Alternanthera philoxeroides - **alligatorweed**
Limnophila sessiflora - ambulia
Schinus terebinthifolius - **Brazilian peppertree**
Ottelia alismoides - **duck-lettuce**
Landolita punctata - **giant or dotted duckweed**
Myriophyllum spicatum - **Eurasian watermilfoil**
Sparganium erectum - exotic bur-reed
Monochoria vaginalis - heartshaped false pickerelweed
Hydrilla verticillata - **hydrilla**
Lagarosiphon major – **lagarosiphon**
Monochoria hastata - narrowleaf false pickerelweed
Melaleuca quinquenervia - **paperbark**
Lythrum salicaria - **purple loosestrife**

Botanical Name - Common Name

Salvinia sp. – **salvinia**
Panicum repens - **torpedograss**
Eichhornia crassipes and *azurea* - **floating and rooted Waterhyacinths**
Pistia stratiotes – **waterlettuce**
Ipomoea aquatica - **water spinach**
Solanum tampicense - wetland nightshade

Texas Department of Agriculture Plant List

TITLE 4.AGRICULTURE. Part 1. TEXAS DEPARTMENT OF AGRICULTURE. Chapter 19. QUARANTINES AND NOXIOUS PLANTS

§19.300.Noxious Plant List.

N= 35 species

Botanical Name - Common Name

Alternanthera philoxeroides - **alligatorweed**

Cardiospermum halicacabum - balloonvine

Schinus terebinthifolius - **Brazilian peppertree**

Orobanche ramosa - broomrape

Alhagi camelorum - camelthorn

Triadica sebiferum - Chinese tallow tree

Cyperus entrerianus - deeprooted sedge

Carthamus lanatus - distaff thistle

Myriophyllum spicatum - **Eurasian watermilfoil**

Spirodela oligorrhiza - **giant duckweed**

Arundo donax - giant reed

Calystegia sepium - hedge bindweed

Hydrilla verticillata – **hydrilla**

Botanical Name - Common Name

Rottboellia cochinchinensis – itchgrass

Cuscuta japonica - Japanese dodder

Pueraria montana var. *lobata* - kudzu

Lagarosiphon major - **lagarosiphon**

Melaleuca quinquenervia - **paperbark**

Lythrum salicaria - **purple loosestrife**

Eichhornia azurea - **rooted waterhyacinth**

Tamarix spp. – salt cedar

Salvinia spp. - **salvinia**

Nassella trichotoma - serrated tussock

Panicum repens - **torpedograss**

Solanum viarum - tropical soda apple

Ipomoea aquatica - **water spinach**

Cryptocoryne beckettii - water trumpet

Eichhornia crassipes - **waterhyacinth**

Pistia stratiotes – **waterlettuce**

CHINABERRY – *Melia azedarach*

JAPANESE CLIMBING FERN – Lygodium japonicum

City of Austin Top 25 Invasive Plant Species

- **Herbaceous**
  - **Giant reed**
  - King Ranch Bluestem
  - Malta star-thistle
  - Bermudagrass
  - Japanese netvein hollyfern
  - Golden bamboo
  - Bastard cabbage
  - Johnsongrass
- **Vines**
  - Japanese honeysuckle
  - Catclawvine
  - **Kudzu**
- **Woody**
  - Tree of heaven
  - Paper mulberry
  - Chinese parasoltree
  - Glossy privet
  - **Chinaberry tree**
  - Heavenly (sacred) bamboo
  - Chinese pistache
  - Scarlet firethorn
  - **Salt cedar**
  - **Chinese tallow tree**
- **Aquatic**
  - Elephant ears
  - **Common water hyacinth***
  - **Hydrilla***

TDA Noxious Plant List (§19.300) species ***TPWD Prohibited Aquatic & Exotic species**

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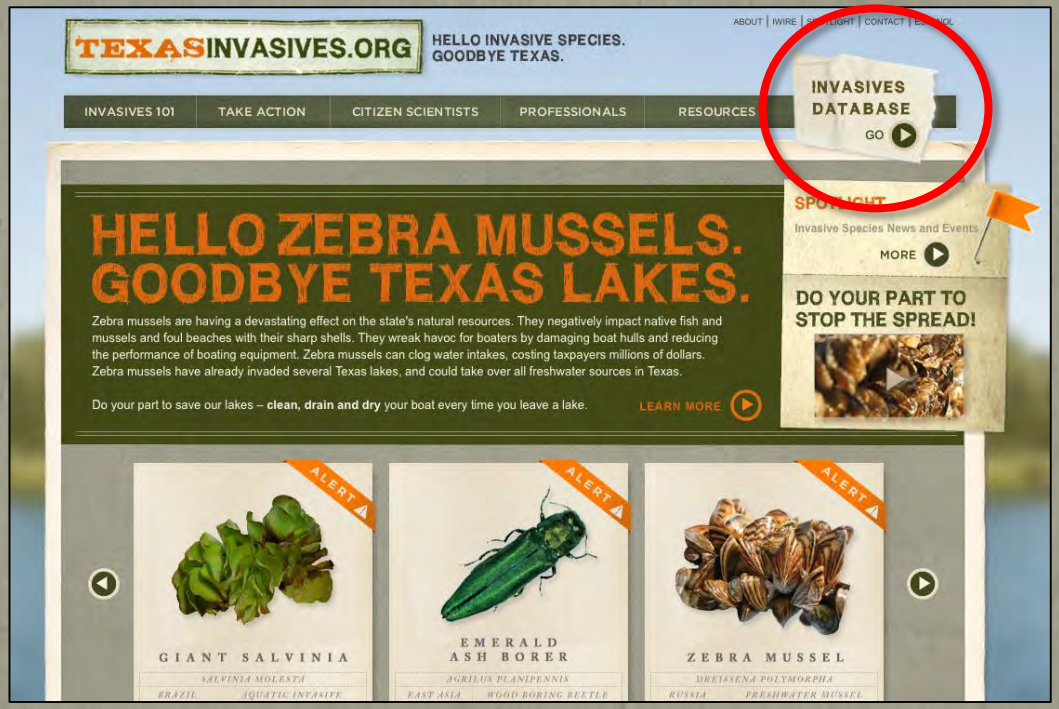

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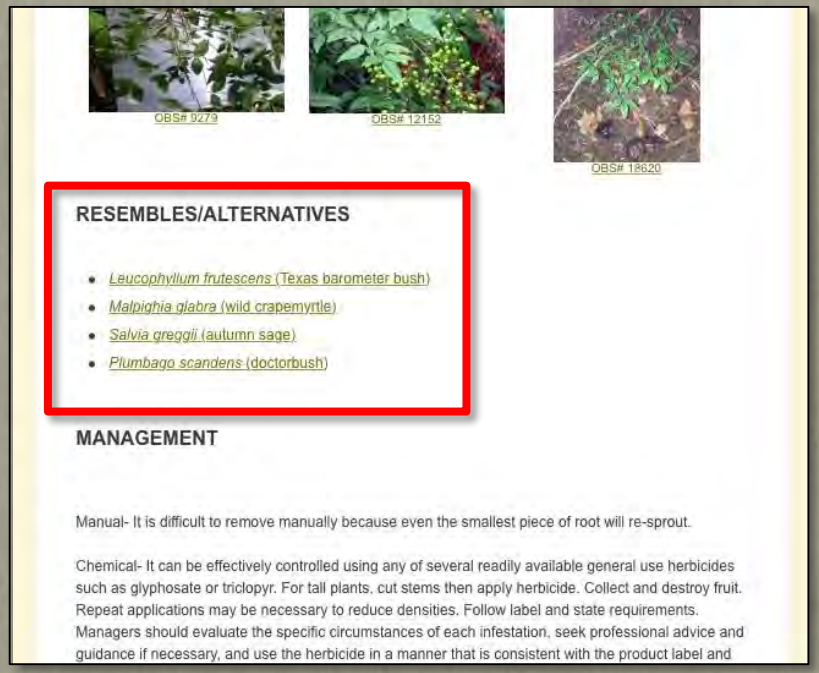


Emerald Ash Borer

Agrilus planipennis

Order: Coleoptera (Beetle)

Family: Buprestidae (Metallic wood boring beetle)

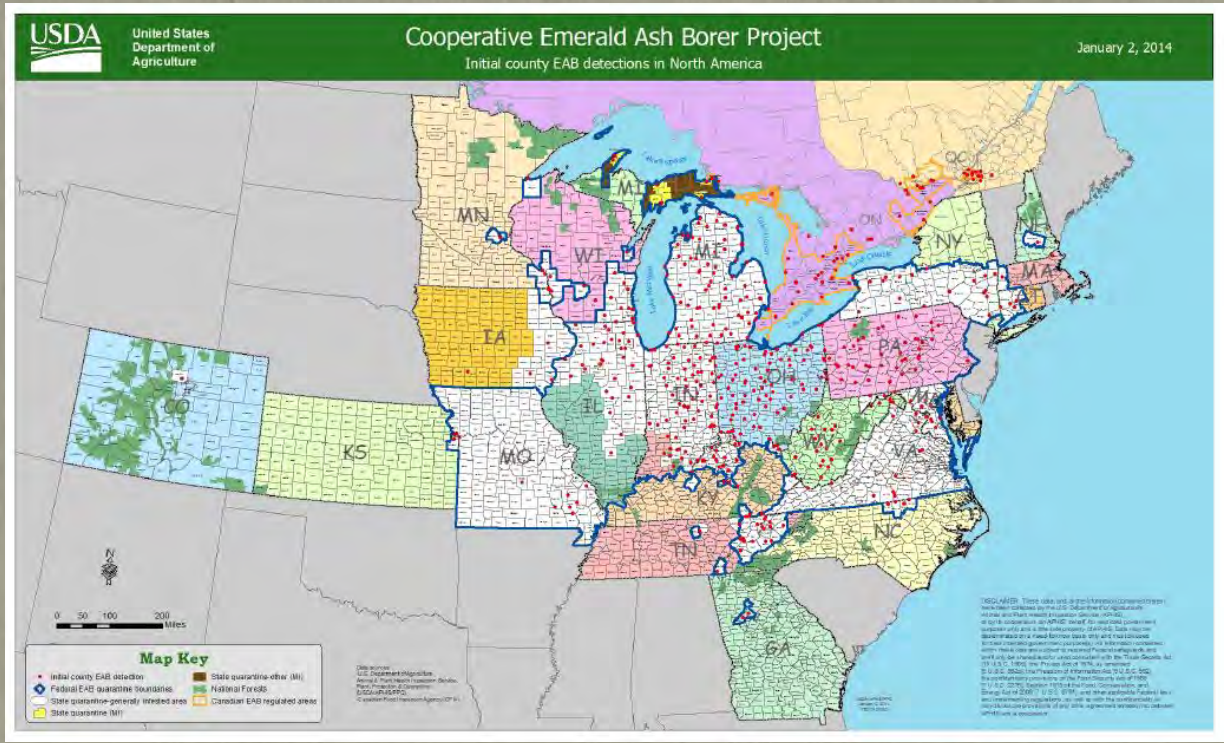
Emerald Ash Borer

Introduction and Distribution

Native Range: Eastern Russia, Northern China, Japan and Korea

Primary Transmission: Wood material shipping, firewood, infested nursery stock

First Detection: Michigan 2002



Emerald Ash Borer

Biology: Host Trees

- Attacks Ash trees (*Fraxinus* sp.)
  - 17 species of ash in North America
  - 9 ash species in Texas
    - Green Ash
    - Texas Ash
    - White Ash

Emerald Ash Borer

Damages

- Urban forests
  - 1/3 of urban trees nationally are susceptible
  - Compensatory value $669 billon.
- Agricultural
  - Timber industry
  - Maple syrup
  - Nursery production
- Recreational tourism

Emerald Ash Borer

Biology: Life Cycle

Biology: Life Cycle

Egg

Larva

Pupa

Adult

Emerald Ash Borer

Biology: Life Cycle

Larvae:

- Creamy-white
- Flattened, 10 bell-shaped segments
- Small appendages at end of body

Emerald Ash Borer

Biology: Life Cycle

Adult:

- Bright, metallic green
- ½" long, flattened back
- Surface of abdomen, coppery-red

Emerald Ash Borer

Signs and Symptoms

- **Canopy die-back**
- D-shaped exit holes
- Epicormic shoots (sprouts from roots and trunk with abnormally large leaves)
- Vertically split bark over s-shaped feeding galleries
- Increased woodpecker activities

Emerald Ash Borer

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Emerald Ash Borer

Signs and Symptoms

- Canopy die-back
- D-shaped exit holes
- **Epicormic shoots (sprouts from roots and trunk with abnormally large leaves)**
- Vertically split bark over s-shaped feeding galleries
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HELLO INVASIVE SPECIES.
GOODBYE TEXAS.

Take Action!

The Sentinel Pest Network

PARTNERS

TEXAS PARKS & WILDLIFE

Wildflower center

TEXAS A&M AGRILIFE EXTENSION

APHIS

SPORT FISH RESTORATION

TEXAS A&M FOREST SERVICE

Sentinel Pest Network

Training Citizen Scientists to Detect & Report Invasive Pests

- Trains citizens to identify and report pests that threaten the natural biodiversity of the state.
- *Participants will:*
  - *Lean to identify sy*
  - *Work with state ar*
    partners to report a
  - *Educate and engage*
    scientists in early det
    monitoring
  - *Participate in outreach campaigns to disseminate information to the public*

Sentinel Pest Network: Background

Serves as a **sentinel network**

- increase the probability of early detection of pests of high regulatory significance

What are "pests of high regulatory significance"?

- From the APHIS PPQ (Plant Protection and Quarantine):
  - plant pests that can create an economic impact on the nation's natural resources and agriculture

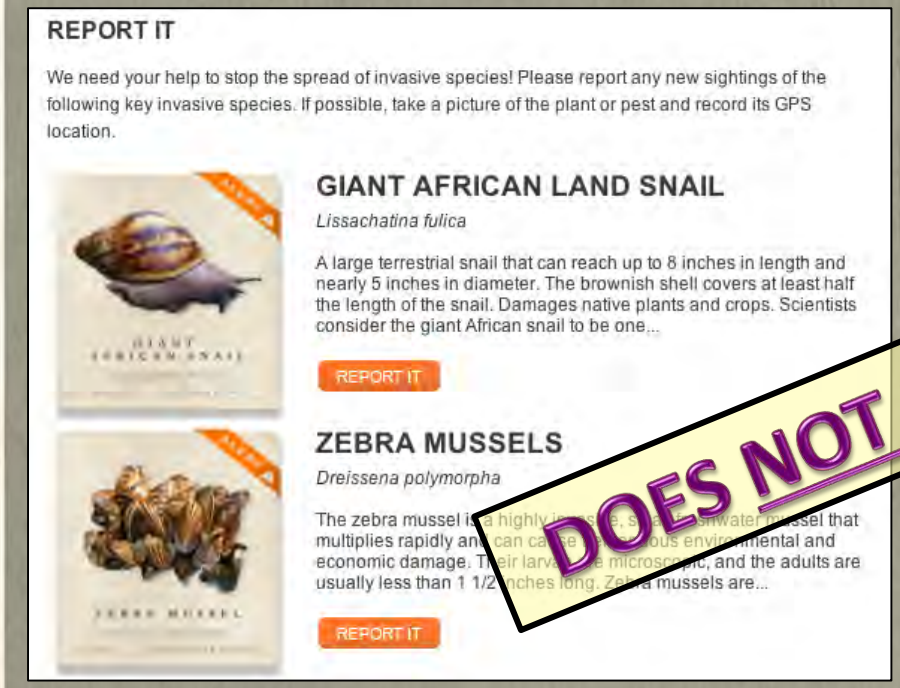
The “Dirty Dozen” Pest List

COMMON NAME	SCIENTIFIC NAME
Asian Longhorned Beetle	*Anoplophora glabripennis*
Brown Fir Longhorned Beetle	*Callidiellum villosulum*
Cactus Moth	*Cactoblastis cactorum*
Emerald Ash Borer	*Agrilus planipennis*
Gypsy Moth	*Lymantria dispar*
Sirex Woodwasp	*Sirex noctilio*
Cogongrass	*Imperata cylindrica*
Giant Hogweed	*Heracleum mantegazzianum*
Onionweed	*Asphodelus fistulosus*
Tropical Soda Apple	*Solanum viarum*
Tropical Spiderwort	*Commelina benghalensis*
Giant African Land Snail	*Lissachatina fulica*

Report It!

Early Detection and Rapid Response (EDRR)

Report online on Texasinvasives.org

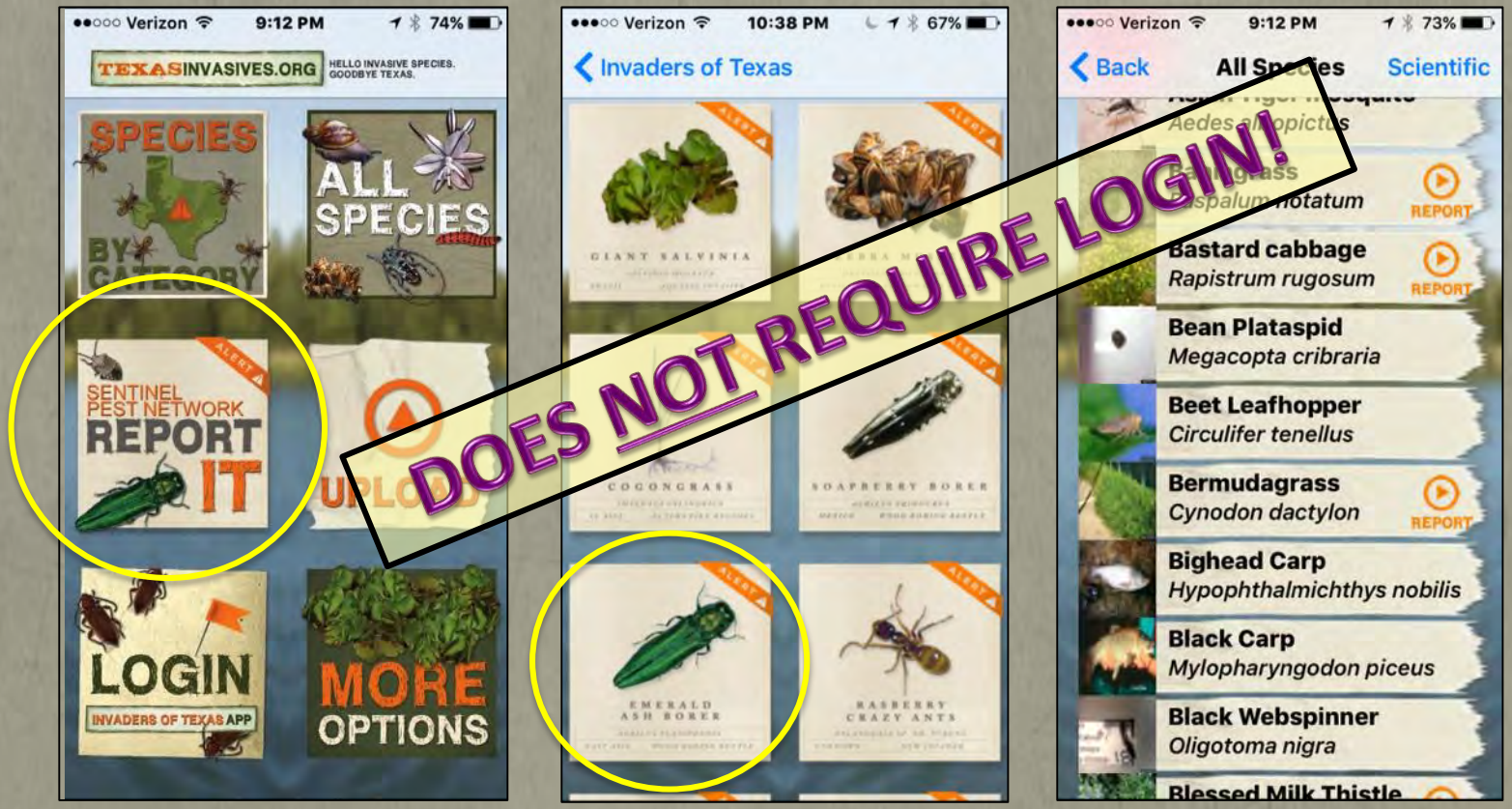


DOES NOT REQUIRE LOGIN!

Does not require an Invaders of Texas Citizen Scientist login account!

Texas Invaders phone app

Reporting a Species for the Sentinel Pest Network



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The Invaders of Texas Citizen Scientist Program

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Invaders of Texas Program

The more trained eyes watching for invasive species, the better our chances of lessening or avoiding damage to our native landscape.

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Invaders of Texas

Detect and Report Invasive Species

- Innovative campaign whereby volunteer "citizen scientists" are trained to detect and report invasive species in their communities
- 11-years
- Texas-wide
- Data collected syste reported nationally.
- Data available to the public, and to local, state, and federal resource managers to facilitate their management efforts.

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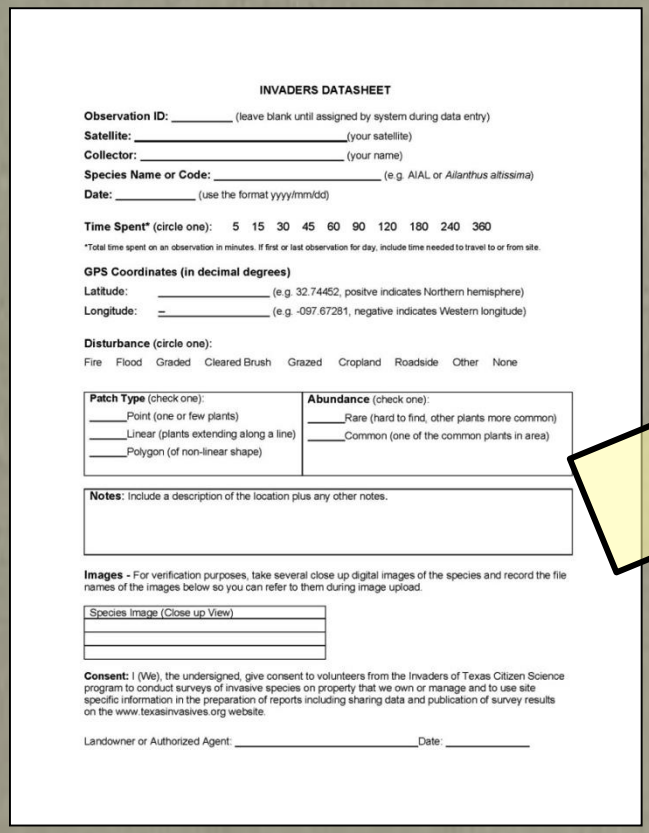
Invaders of Texas Data

Data Collection



INVADERS DATASHEET

Observation ID: _____ (leave blank until assigned by system during data entry)
Satellite: _____(your satellite)
Collector: _____ (your name)
Species Name or Code: _____ (e.g. AIAL or *Ailanthus altissima*)
Date: _____ (use the format yyyy/mm/dd)

Time Spent* **(circle one):** 5 15 30 45 60 90 120 180 240 360

*Total time spent on an observation in minutes. If first or last observation for day, include time needed to travel to or from site.

GPS Coordinates (in decimal degrees)
Latitude: _____ (e.g. 32.74452, positve indicates Northern hemisphere)
Longitude: _____ (e.g. -097.67281, negative indicates Western longitude)

Disturbance (circle one):
Fire Flood Graded Cleared Brush Grazed Cropland Roadside Other None

Patch Type (check one):	**Abundance** (check one):
_____Point (one or few plants)	_____Rare (hard to find, other plants more common)
_____Linear (plants extending along a line)	_____Common (one of the common plants in area)
_____Polygon (of non-linear shape)	

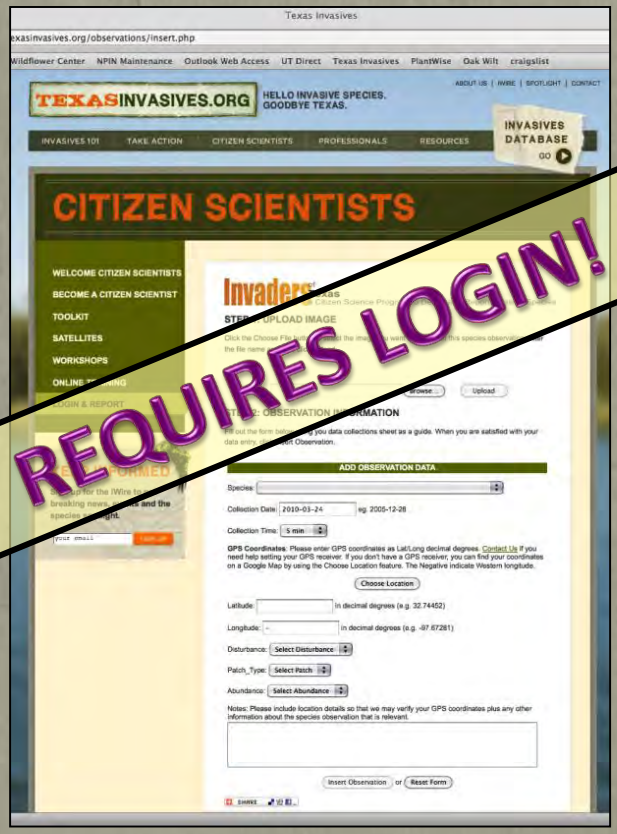
Notes: Include a description of the location plus any other notes.

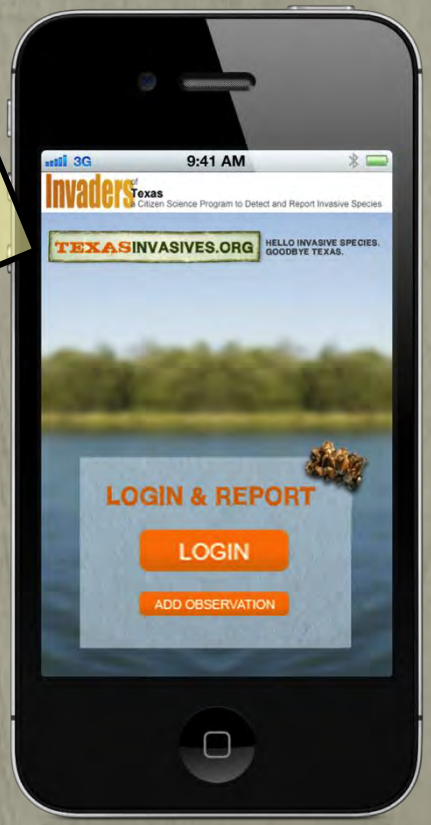
Images - For verification purposes, take several close up digital images of the species and record the file names of the images below so you can refer to them during image upload.

Species Image (Close up View)

Consent: I (We), the undersigned, give consent to volunteers from the Invaders of Texas Citizen Science program to conduct surveys of invasive species on property that we own or manage and to use site specific information in the preparation of reports including sharing data and publication of survey results on the www.texasinvasives.org website.

Landowner or Authorized Agent: _____Date: _____





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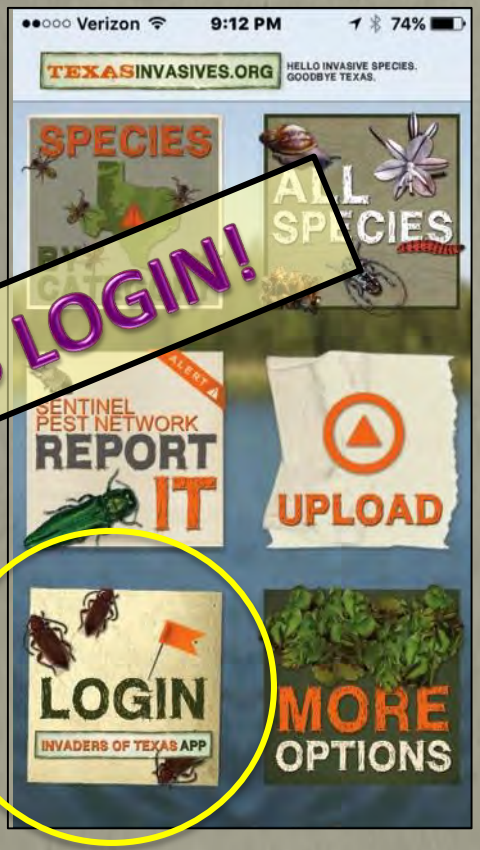
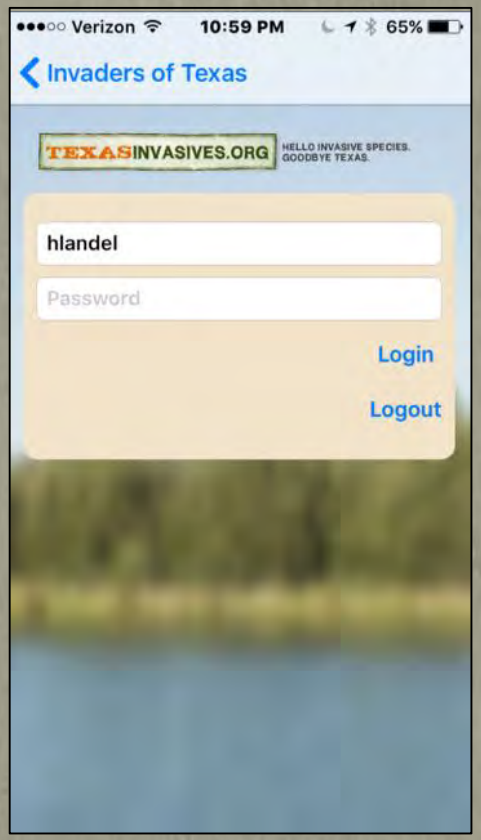
“Texas Invaders” phone app

Submitting observations

REQUIRES LOGIN!





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Invaders of Texas Data

Contribution – Data Mapping

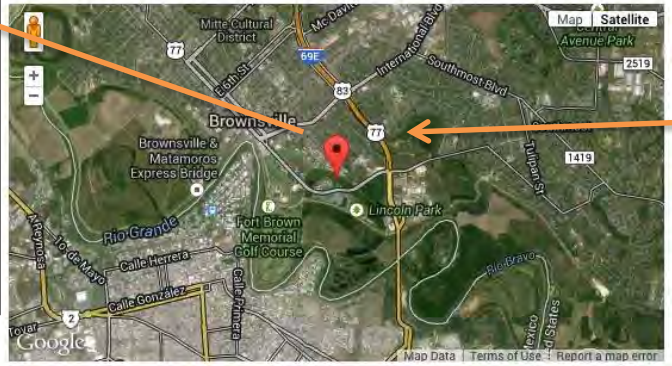
Interactive and searchable by Species or Satellite and linked to individual records.

SPECIES OBSERVATION #13431

Arundo donax **- Giant reed**

SPECIES DATA	COLLECTION DATA	VALIDATION
USDA Code: ARDO4 Patch Type: Polygon Abundance: Common Disturbance: Other	Collector: Michael Murphrey Satellite: Pineywoods Invaders Date: 2011-01-29 Time: 5.0 minutes Location Error:	Validated: Yes Date: 2011-02-09 By: Travis Gallo

Collection Notes: Scattered Patches all the way around the Lake Brown Resaca/Lake. East of University Blvd. on the Uni. of Texas-Brownsville Campus. Mainly south of the Education and Business Departments.



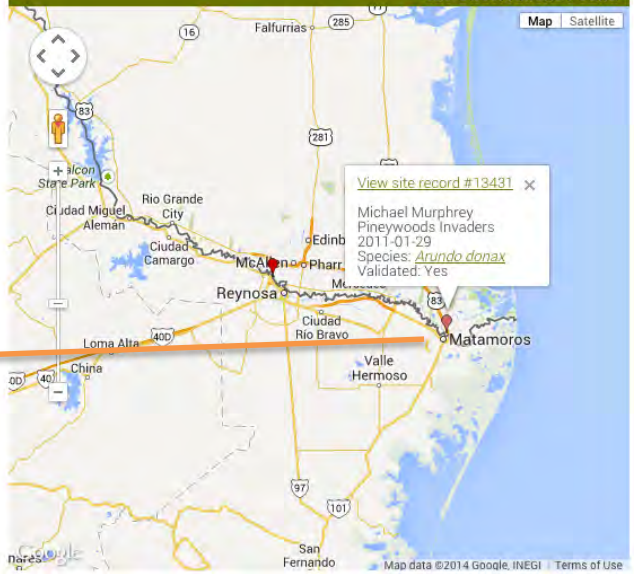
MAP INVASIVES

Map Satellites

Arundo donax – 826

BECOME A CITIZEN SCIENTIST

826 Observations Found



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KEEP INFORMED

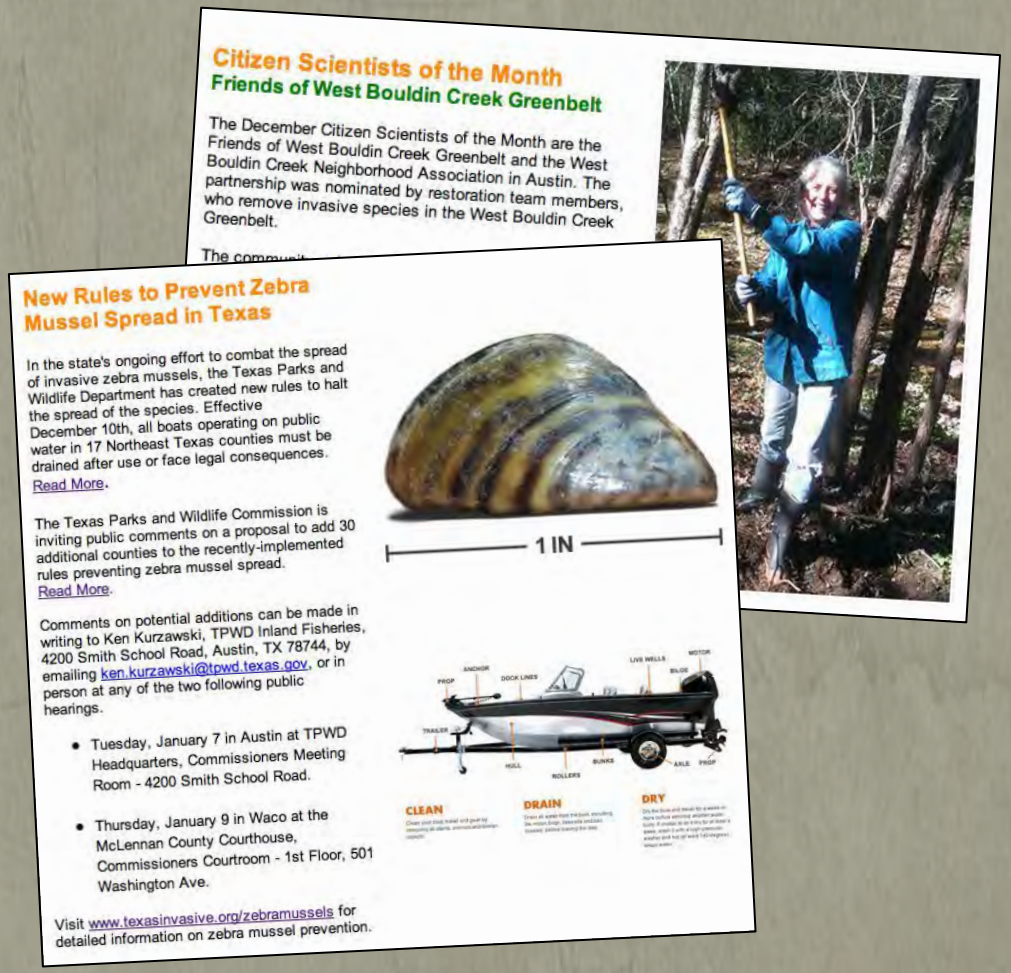
Sign up for the iWire to get breaking , events and the species spotlight.

your email SIGN UP

Public Awareness Campaigns

The iWire monthly email newsletter

- Important updates
- Invasive species spotlights
- News from TX and beyond
- Citizen Scientist of the Month (person, group or project)
- 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 comm

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.

1 IN

CLEAN DRAIN DRY

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Summary

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Invasive Species in Texas

Summary

Invasive Species are a **Cause for Concern** because:

- Introduced species cause economic, environmental, or human health damages
- Spreading widely and quickly

Many Invasive Plants Originated from Horticulture

- Several are still being sold

Control the spread:

- Plant with native species
- Know your species

Keep an eye out for important pests

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Thank you!

Hans Landel, Ph.D.
Invasive Species Coordinator
Lady Bird Johnson Wildflower Center
(512) 232-0107
hlandel@wildflower.org

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