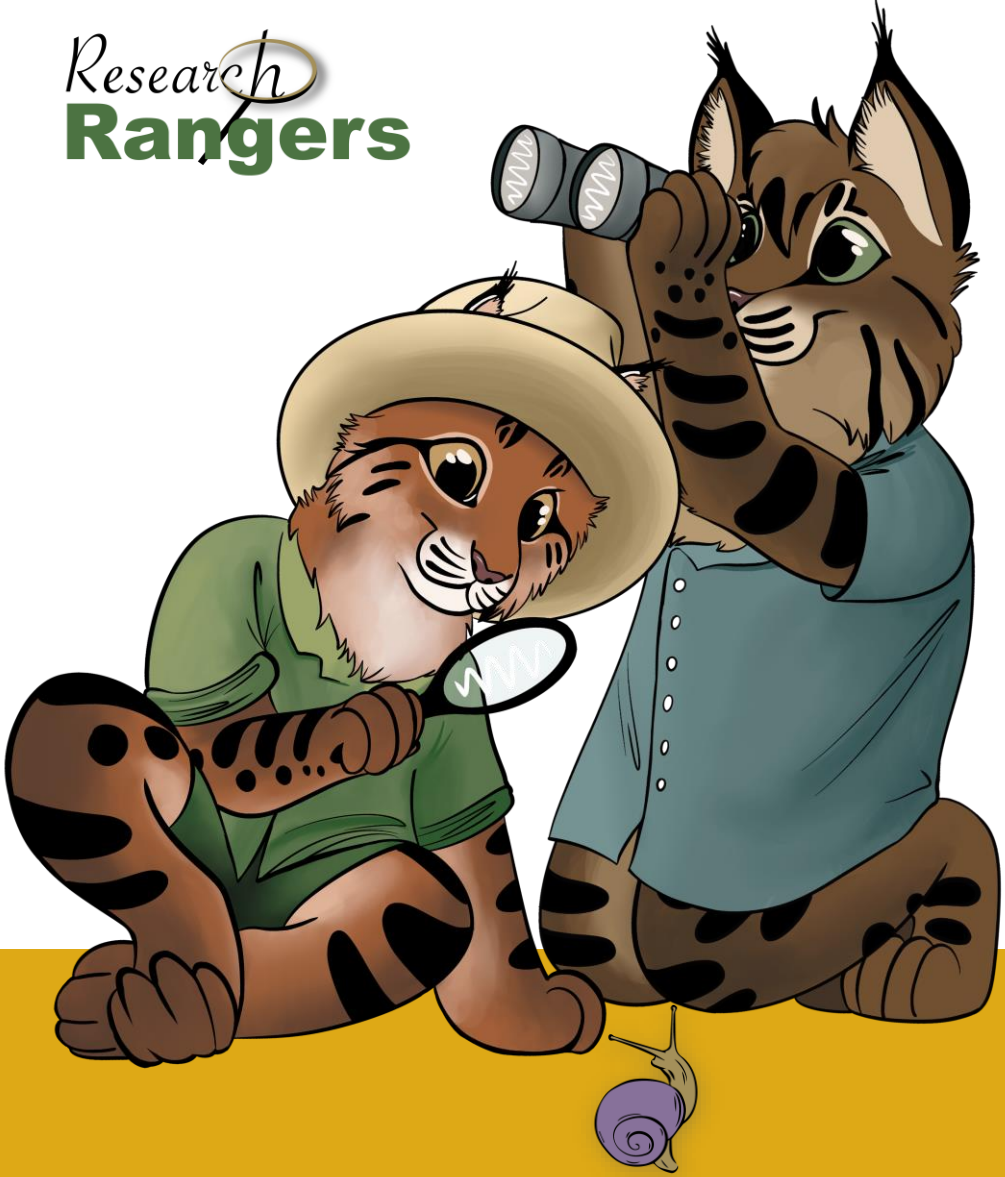


Nature Invaders



Research Rangers





What is Research Rangers?

Research Rangers is about inspiring people to spend more time exploring the natural world around them. We want to encourage and support people of all ages, abilities and backgrounds to enjoy and study wildlife in their local area and to observe and record information about the local environment.

Find out more at: researchrangers.wp.txstate.edu

What You Get to Do!

In this activity you will:

- Learn about invasive and native species
- Explore your local environment and record the plants you find
- Help keep an eye out for Texas' most wanted
- invasive species



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Supported by



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Build Your Knowledge

What Are Invasive Species?

Invasive Species are plants or animals that have been introduced to an area where they are not typically found. Most of the time they do not have any natural predators and are able to outcompete native species for resources. Because of this, invasive species populations can grow quickly and drive native species to local extinction.



Invasive Caster Bean plant, Evan Walsh - HCMN



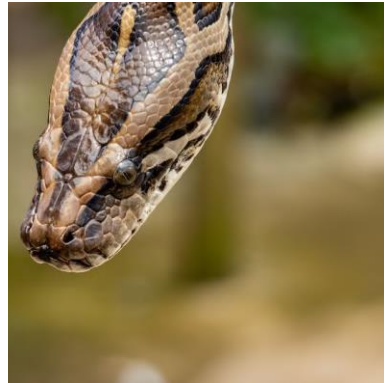
Native Turk's Cap, Evan Walsh - HCMN

What are native species?

Native Species are plants and animals that naturally occur in an ecosystem. Native plants and animals evolved in these locations over million of years. Native species are important for maintaining the complex interactions that occur in an ecosystem.

How do invasive species get introduced to new environments?

Invasive species are generally **introduced** by humans, sometimes on purpose and sometimes by accident. The Burmese Python, for example, is a large snake native to India and China. It is popular as a pet, and is bred in captivity in the United States. A wild, **introduced**, population is believed to have been established in Florida when Hurricane Andrew hit the state in 1992. When a Burmese Python breeding facility was destroyed, all of the snakes escaped outside. They now have a wild, breeding population that take resources away from native birds, mammals and other reptiles.



Invasive Burmese Python, Tomáš Malik

Build Your Knowledge

How do invasive species out compete native species?

Invasive species can outcompete native species, which can result in the decline of native populations. This happens because invasive species typically have a few traits that give them a competitive edge over native species.

Shared Traits

Lack of Natural Predators

Invasive plants and animals may not have any natural predators when they arrive in their new location. As a result, their population sizes can increase without the risk of being eaten.



Invasive Malta star-thistle, Jack Downey - HCMN

Fast Growth

Invasive plants and animals can generally grow faster than their native competition. Growing faster can be beneficial to plants because it allows them to gather resources like light and water more effectively.



Invasive Giant Reed, Jack Downey - HCMN

Generalist Strategy

Invasive species are typically "generalists". This means that they can survive and grow in a wide range of environmental conditions. This allows invasive plants to invade different types of environments. The opposite of being a generalist is called a "specialist". Specialists need the environment to be a specific way in order to survive and grow.



Invasive Bastard Cabbage, Jack Downey - HCMN



Know Before You Go

Materials You Will Need:

- Your Research Rangers Activity Book
- Pencil/Pen
- Watch/Timer
- Optional: Camera/Phone, Clipboard, iNaturalist App



Location Suggestions:

- Local Park
- Nature or Hiking Trail
- Backyard
- Schoolyard
- Garden
- Anywhere in Nature

Safe Science



Give animals **space**. Keep a safe distance from any wildlife you see.



Stay **calm** and **quiet** around wildlife. Respect their habitat.



Do not touch wildlife or their habitats.



Do not eat anything that you find unless you are sure it is safe.



Invasive Plants Field Guide - Cause Damage



Giant reed (*Arundo donax*) is a large species of grass capable of growing up to 20 feet in height! It can grow rapidly near bodies of water and can outcompete native vegetation if left unchecked.



Johnson grass (*Sorghum halepense*) is an invasive grass that can often be seen growing along roadsides in Texas. It produces seeds that can remain viable for up to 20 years, making it a very difficult plant to control.



Glossy privet (*Ligustrum lucidum*) is an invasive tree that is originally from China. It is spread to new locations by birds and other animals eating its fruits and carrying its seeds to new locations. It is believed to contribute to allergies.



Bastard cabbage (*Rapistrum rugosum*) is able to outcompete native plants by growing broad leaves that prevent light from reaching smaller plants. It can often be seen growing along side streams and roadsides.



Heavenly bamboo (*Nandina domestica*) was originally planted in gardens because of its red to green leaves and bright red berries. Unfortunately, it has escaped these gardens. Its berries are also toxic to humans, pets and wildlife making it especially harmful.



Malta star-thistle (*Centaurea melitensis*) is an invasive plant with a yellow-flowered head that produces sharp spines. It is capable of producing 150,000 seeds in a single season that are carried to new locations via the wind.

Native Plants Field Guide - Belong in TX



The **Pecan tree** (*Carya illinoensis*) is native to the southern part of the United States and Mexico. The nuts that the tree produces provide food for a variety of wildlife! It blooms from March-May.



Turk's Cap (*Malvaviscus arboreus*) is a native shrub that produces vibrant red flowers that never fully open. It provides nectar to butterflies, hummingbirds, and moths. Wildlife eat the berries of this plant. It blooms from May-November.



American beautyberry (*Callicarpa americana*) is a native Texas shrub often grown in gardens. It produces purple berries that birds and deer use for food. It blooms from May-July.



Bluebonnet (*Lupinus texensis*) is the state flower of Texas. It produces beautiful blue flowers with a white cluster at the top. It blooms from the months of March-May.



Firewheel (*Gaillardia pulchella*) is a native Texas wildflower. Texas State University was inspired to select it's official school colors from this flower. Its beautiful colors can be seen when it is in bloom from March - May.



Sideoats Grama (*Bouteloua curtipendula*) is the official state grass of Texas. It gets it's name from the oat-like seeds that can be seen hanging down the side of the stem. It blooms from June-November.

What Do You Think?

Common Traits of Invasive Plants

1. Fast Growth
2. Lack of Natural Predators
3. Generalists Strategy
4. Fast Reproduction
5. Tolerate a Wide Range of Natural Predators

1. I predict that Giant Reed is invasive because it likely: (Circle your answers)

Grows: Fast or Slow

Use resources in a: General Way or Specialized Way

Competition with others:

Outcompetes Natives or Do not impact other species

2. Predict how you think Heavenly bamboo might have been introduced (or brought) to where it may be found growing?

I predict that Bastard cabbage will likely have: (Circle your answer)


Natural predators or No natural predators

Explain your reasoning:



Capture Your Observations

Today, you will be making observations as a community scientist! You will find and identify 3 different plant species and record the plant's name (if you need help, use iNaturalist), what it looks like, describe the plant in your own words and where you found it!

Plant Name	Sketch	Description	Location Found
Example 1 American beautyberry		Shrub-like with bright purple berries	Texas State University Gardens San Marcos, TX
Plant 1			
Plant 2			
Plant 3			

(Optional) iNaturalist Resource



The iNaturalist app is an optional resource that can help you identify plants, insects, and animals for your Research Rangers projects. It is easy to use once you get it set up on your phone or other mobile device.

1. Download the iNaturalist app from the Google Play Store or the Apple Store onto your mobile device.
2. Sign up for an account. Then, click on the Projects button at the bottom of the app, search for the Research Rangers Project, and join!

<https://www.inaturalist.org/projects/research-rangers>

3. Open iNaturalist and click “+ Add Observations or tap the camera icon labeled “Observe.” Take a photo or upload a picture of what you found.
4. Need help identifying what you found? Click “*what did you see?*” to view possible identification suggestions.
5. Add your observation to the Research Rangers project to get more information. This can be done by clicking Projects and selecting the Research Rangers project before clicking Save or Submit.

For more information go to <https://www.inaturalist.org/>



Ranger Reflections

1. I think it is important to report where I find invasive plants because:

2. Why do you think native species are important to their ecosystem?

3. What are at least 3 species of plants that you are aware of that are invasive?

Plant 1:

Plant 2:

Plant 3:

4. Giant reed and Johnson grass are two invasive species that can be found throughout Texas. What are two traits these plants have that you think give them an advantage over native plants?

Trait 1:

Trait 2:



Giant Reed



Johnson Grass

Cultural Connections



Art by Raylee Schobel, @rayleeschobel.art on Instagram

La Patasola

La Patasola, or “one leg,” is a vampire-like creature from Colombian mythology often thought of as the protector of the Andes mountains. She lures men who seek to exploit nature for their own personal gain into the forest using song, where she then turns them into a tasty meal. She protects the mountains from humans who would introduce invasive species to make a profit. This story is passed down by the Quecha, indigenous people of the Andes mountain range, and it teaches a lesson they refer to as “sumac kawsay” which means to live in the correct way. Think about La Patasola when you go out into nature. Be careful about what you bring with you to help prevent the spread of invasive plants that can cause damage. You can help her protect our native plants.



Scientist Spotlight



Ashley Morgan-Olvera, M.S. runs the Texas Invasive Species Institute over at Sam Houston State University in Huntsville, TX.

Ashley Morgan-Olvera provides educational workshops, field days and activities to help everyone learn about invasive species and the harm they pose to our environments. Invasive species can be plants, insects, mussels, fish, mammals, even bacteria and fungi! Mrs. Morgan-Olvera travels all over the state to not only educate the public, but to search for invasive species too. She is part of an Early Detection and Rapid Response program, that lets her wander through the mud, creeks, crop fields, cities and forests looking for invasive species. But she needs your help reporting and tracking these species, visit texasinvasives.org to find out how!

Q&A

Q: What sparked your interest in the natural world?

A: "My interest in the natural world started as a small child. My mother used to take us to a local bird sanctuary that always had so many types of wildlife within it, even though it was inside the city of Houston. I wanted to learn more about the animals and plants I would see at the sanctuary and how I can help save endangered animals. We started buying wildlife and conservation books, and the rest is history!"

Q: What do you love about being a scientist?

A: "What I love about being a field researcher is that I get to be outdoors! Most of my spring and summer months are spent looking for invasive species across Texas. I love that I can enjoy being outside while helping protect Texas from invasive species."

Q: What advice would you give to young people if they are interested in a career in science/nature?

A: "Go for it, because nature needs your help! Volunteer with nature preserves, local parks, bird/plant sanctuaries, or your zoo to see what will inspire you. Whether you end up studying a new cancer treatment, track deer populations, or look for invasive fishes, growing our knowledge of science and nature is so important!"

Above and Beyond

How can you help prevent the spread of invasive plants?

Learn to Identify Invasive Species

The first thing you can do is learn what invasive species look like. It can be hard to tell what is an invasive plant and what is a native plant without any training, so apps like iNaturalist are great for getting started.

Report your findings to authorities

After confirming the identity of the plant you are looking at, you can report your findings to the proper authorities. Early reporting is essential to preventing the spread of invasive plants. Leave a comment on your submitted iNaturalist observation in the Research Rangers project and we will do the reporting for you!

Volunteer!

The most impactful thing you can do is volunteer for programs like The Invaders of Texas Program. If you volunteer for the Invaders of Texas Program you will receive training on how to identify and report invasive plant species. You will work with a team of community scientists to go out and locate invasive plants and work closely with local authorities to help prevent the spread of invasive species!



Extra Activities & Information

Need help getting started? Watch the Research Guide Video for more information about this activity!



<https://researchrangers.wp.txstate.edu/ranger-guides/>



Learn more about invasive species in Texas



<https://www.texasinvasives.org/>



Invasive species tag game



<https://tinyurl.com/InvadersTag>



Invasive species dice game



<https://tinyurl.com/InvasiveGrass>



Learn more about the Hays County Master Naturalist Nature Superstars!



<https://www.beautifulhayscounty.org/coloring-book>



Learn more about other Research Rangers Activities!



<https://researchrangers.wp.txstate.edu/>

