

Aquatic Nuisance Species: What are They and How Can We Prevent Them?



An educational workbook designed for students in 3rd – 6th grades, though encouraged to be used by all students who may benefit.

What are Aquatic Nuisance Species?

Aquatic Nuisance Species (ANS) are **non-native** organisms that have been introduced into a new area. These undesired **species** often threaten the diversity and abundance of native species. They can also be a threat to human health. Non-native species, or **invasive species**, can have severe negative ecological and economic impacts to the **ecosystems** they invade. They may be introduced into an area by humans from actions like aquarium releases, hitching a ride on boat trailers, or improperly dumping ballast water from cargo ships. They may also be transported by natural processes like hurricanes or floods. Invasive species may be introduced at any life stage (from seeds/eggs to adults) and may occur within inland, estuarine, or marine waters. Because they often spread rapidly in new locations, they can be very difficult to control or **eradicate** once established.



Whether they are plants or animals, ANS can create lots of problems when they are introduced. As such, it is important to learn how to recognize them; understand what impacts they may have on our native species and habitats; learn why we shouldn't release them into areas outside of their native range; and know how we can **prevent** their introduction.

Examples of ANS in Georgia or the Southeastern U.S.

Flathead Catfish



Mottled catfish responsible for declines in sunfish & bullhead fisheries in the Altamaha, Satilla, and other Georgia Rivers.

Giant Salvinia



Invader of water's surface, this **small-leaf plant** threatens ecosystems & recreational activities.

Northern Snakehead



This **air-breathing fish** invades and may force out native predatory fish.

Tiger Shrimp



These **giants** grow to **12"** and uncertainty exists as to the potential impacts they may have on native shrimp.

Hydrilla



Degrades aquatic habitats and may be linked to death of bald eagles.

Lionfish



Florida FWCC

Loves to eat! Will eat just about anything, **causing harm to native fish like grouper/snapper.**

Silver Carp



USFWS

Can weigh up to 70 pounds and jump **10 ft** out of the water. A major threat to boaters.

Zebra Mussel



USGS

Known to drive out native mussels and has caused **millions of dollars in damage to water intake pipes** and other structures.

The Negative Impacts of Just One ANS



Redbreast Sunfish



Bullheads



Redear Sunfish



Bluegill Sunfish



Black Crappie



Warmouth Sunfish



Largemouth Bass



American Eel



American Shad



White Catfish



Chain Pickerel



Channel Catfish

Sometimes fish can be native to one area but be non-native and introduced into another area, even within the same state. An example is the Flathead Catfish. Since their introduction into several Georgia rivers (Altamaha, Satilla, Savannah, etc.), Flathead Catfish have been found to eat several native species, including those above. Invasive predators like the Flathead Catfish can have harmful, or detrimental, impacts to these species. This illustration shows us just how much danger one non-native species can bring to an ecosystem!

How Can I Help Prevent ANS?

You may be wondering how you can help in the efforts to prevent the movement of ANS. Well, no matter your age, **YOU CAN HELP!** Here's some practices you can start doing:

AQUARIUMS:

NEVER release aquarium species (fish or plants) into Georgia waters. Instead, contact the pet store you purchased them from and ask about returning the animal, or contact your local DNR office for assistance.



TexasInvasives.org

BAIT:

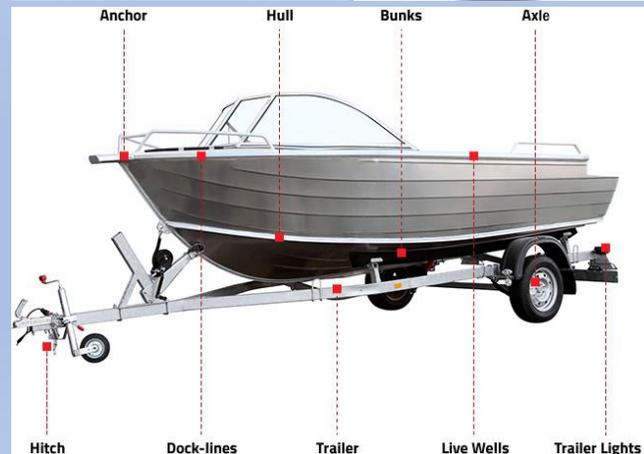
After fishing, **ALWAYS** properly dispose of bait and **DON'T** release live bait back into waters from which it did not come.



Illinois Sea Grant

BOATS:

Prior to launching your boat and after taking your boat out of the water, make sure it is **COMPLETELY** clean and free of mud, plants, mussels, or other animals. **CLEAN** all gear, watercraft, trailer, motor, and equipment thoroughly. **DRAIN** water from gear, boat, bilge, motor and livewell by removing the drain plug and opening all water draining devices away from the boat ramp. **DRY** everything thoroughly before going to other waters and landings.



<https://stopaquaticitchhikers.org/>

By taking these simple actions, you can help the Georgia DNR protect our native aquatic resources for future generations!

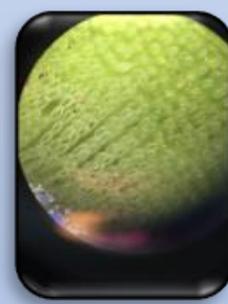
Let's Learn About ANS

Test your knowledge with these True/False questions:

1. The small size of zebra mussels keeps them from creating big problems. (True / False)
2. Lionfish don't hurt fish of commercial or recreational importance. (True / False)
3. Releasing non-native fish from your aquarium into the wild is a wise way to get rid of the animal. (True / False)
4. Tiger shrimp can grow much larger than our native shrimp, reaching lengths upwards of 1 foot long. (True / False)
5. Snakeheads have the ability to breathe air and stay out of the water for several hours. (True / False)
6. The small leaf size of Giant Salvinia prevents it from being a threat to ponds and lakes. (True / False)
7. Some nuisance plant species may be transferred from one lake to another on boats and boat trailers. (True / False)
8. Certain Asian carp have been known to jump upwards of 10 feet out of the water when startled. (True / False)



NOAA



UGA

Answers:

1. False – Despite being about the size of a small fingernail, zebra mussels group together and clog pipes, etc., costing the U.S. \$1 billion annually.
2. False – Lionfish can be devastating to many commercially and recreationally important species, including grouper and snapper, either by eating them or eating their prey.
3. False - The introduction of non-native fish, including aquarium species, may be harmful and detrimental to native fish, so don't release your aquarium fish into the wild.
4. True - These large non-native shrimp can grow to 13" and may negatively impact our native shrimp.
5. True - Not only can snakeheads breathe air out of water, some species are able to wriggle their bodies and move short distances across land.
6. False - Though the individual leaves of giant salvinia are small (about the size of your fingernail), the plant forms large mats that can DOUBLE in size in less than 1 week, covering entire waterbodies and causing grave threats to native plants and fish.
7. True - Several nuisance species, like hydrilla, have been introduced into waterbodies via boats and trailers. As such, it's important to thoroughly clean your boat and trailer EVERY TIME you get off of the water prior to trailering to another location.
8. True - The ability of Asian carp to leap out of the water poses a serious threat to boaters, as these fish can attain sizes in excess of 60 lbs.

Can You Find the Hidden ANS Words?

****Words may be vertical, horizontal, diagonal, or reverse**

R R A M L F F R Q U L L T Z W L M S F B
N L Q E X H A L Y W U X E S Y N J X L N
D U E V I T A N N O N M K V E O X S A W
J P C Q Q T G G T T A R B R L L S Y T K
Y U A G J X I N U N Z L A C I L E K H Q
W S S U Z P F T P A B D A A A N W T E H
N P F M X R V F Y G I P N H O L D A A A
C F U U K E P G U C E S Y U E K V Y D G
N U M I O V Y X A V E A R U C H E A T D
C E S R N E Y T S L C E L W N K T T E J
M A N A N N E W P I S Y X A A N U U V F
I T A U D T G P N G T B M N S F C S I R
O G K Q P I A T U A X T K O I N K A S H
N U E A N O H H P L P V P Z U M I L A S
L C H V K N E X Q F G R C J N Z Z V V I
H Y E P R A C N A I S A U I I Y D I N F
E S A Q W L Z B Q T M G E G W U C N I N
O F D U A G Y G X Y U S M M M H Z I Z O
J R E C O S Y S T E M R X T H D Q A B I
C W B M E I F I T S A L L I R D Y H V L

Word Choices:

APPLESNAIL	HYACINTH	HYDRILLA	FLATHEAD	ASIANCARP
SNAKEHEAD	SALVINIA	LIONFISH	INVASIVE	NONNATIVE
NUISANCE	PREVENTION	ERADICATE	ECOSYSTEM	AQUARIUM

Multiple Choice – select the BEST answer for each question

1. What kinds of problems can non-native species cause for native species?

- A. They compete for food and other resources
- B. They may introduce disease
- C. They may prey on native species
- D. They may interbreed with native species
- E. All of the above

2. It is estimated that the damage caused by invasive species cost the U.S. each year approximately:

- A. \$120
- B. \$12,000
- C. \$120,000
- D. \$12 million
- E. \$12 billion

3. What marine fish species is believed to have been introduced in the Southeastern U.S. by way of people releasing them from their aquariums?

- A. Nutria
- B. Lionfish
- C. Flathead Catfish
- D. Grass Carp
- E. Spotted Bass

4. Sometimes referred to as the “World’s Worst Aquatic Invasive Plant,” this fast-growing submersed species can cover an entire lake and is easily transported by fishermen who do not adequately wash their boat, trailer, and equipment:

- A. Common Cattail
- B. Smooth Cordgrass
- C. Hydrilla
- D. American Lotus
- E. Arrowhead/Sagittaria

5. If you catch a non-native fish, you should NEVER:

- A. Release the fish outside its native range
- B. Take a picture of the fish
- C. Report it to your local DNR office
- D. Keep the fish
- E. Try and catch more

6. What are some common ways invasive species are introduced into a new area?

- A. Humans (dumping aquarium, bait release, etc.)
- B. Aliens
- C. Natural events (hurricanes, floods, etc.)
- D. Both A & B
- E. Both A & C

7. As a snake that can grow upwards of 20' in length, Burmese pythons are known to eat lots of animals, including what ENDANGERED species?

- A. White-tailed Deer
- B. American Alligator
- C. Wood Stork
- D. Largemouth Bass
- E. Eastern Cottontail Rabbit

8. Known for its bright pink eggs and aggressive eating of native vegetation, the largest NON-MARINE snail in the Southeastern U.S. is the:

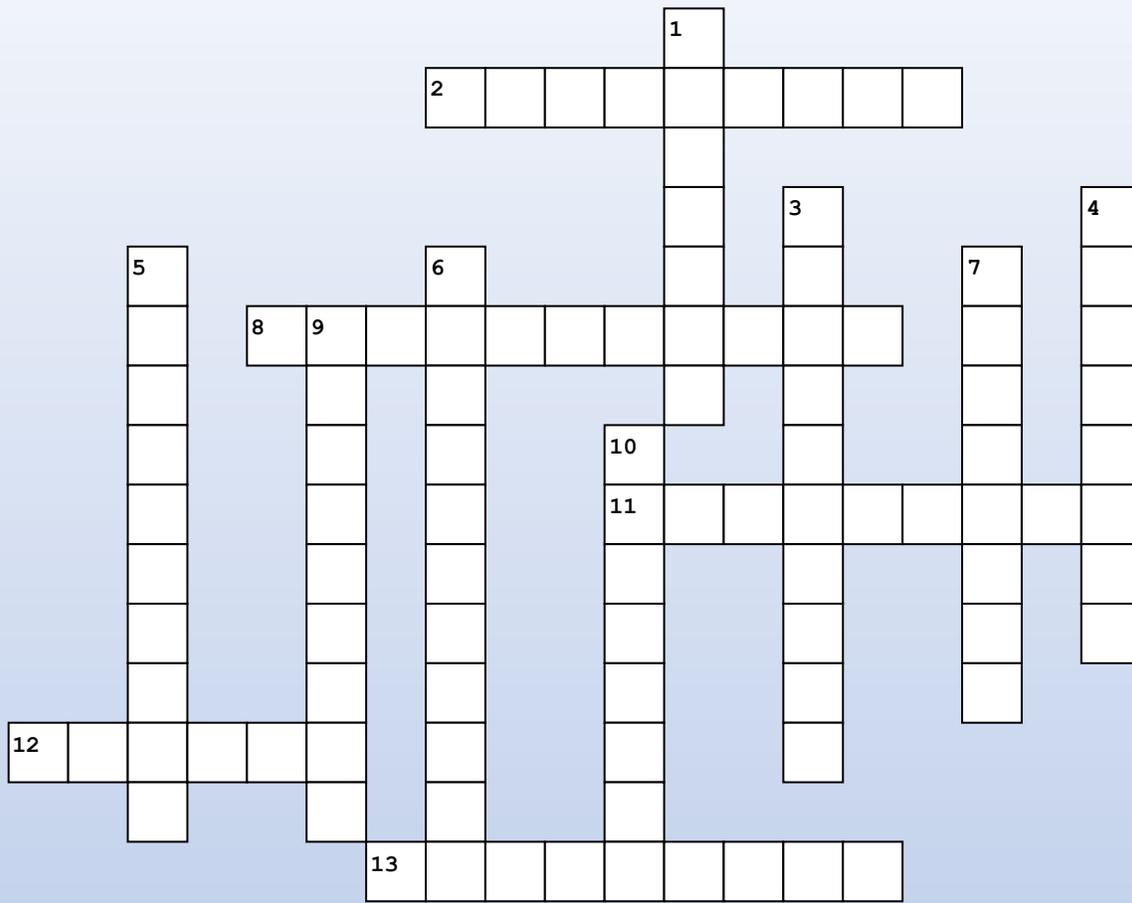
- A. Island Apple Snail
- B. Knobbed Whelk
- C. Horse Conch
- D. Common Periwinkle
- E. Auger Snail

9. If you have an aquarium species you no longer can keep or want, you should:

- A. Contact your local pet store and see if they will buy/take it back
- B. Release it in a nearby pond, lake, stream, or river
- C. Contact your local DNR office for guidance on getting rid of the animal
- D. All of the above
- E. Only A & C

Answers
1. E 2. E 3. B 4. C 5. A
6. E 7. C 8. A 9. E.

Can You Solve the ANS Crossword?



Across

2. the preying of one animal on others.
8. a striped mollusk known to clog pipes and cause significant ecological/economic harm.
11. not indigenous or native to a particular place.
12. of, found in, or produced by the sea/ocean
13. a fish known to breath air and can move across land for short distances.

Down

1. heavy material (often water) placed in the bottom of a vessel to improve its stability.
3. the act of hindering a non-native organism from being introduced.
4. a predatory catfish with a large head and mottled body known to eat many other native species.
5. a fish that often leaps upwards of 10ft when startled.
6. the complete removal and destruction of a species.
7. a small-leaved plant that grows in large mats and can cover an entire pond surface.
9. a biological community of interacting organisms and their physical environment.
10. something that tends to spread undesirably and/or harmfully

Word Choices:

Nonnative, SilverCarp, Snakehead, Invasive, Predation, ZebraMussel, Flathead, Salvinia, Ecosystem, Ballast, Eradication, Prevention, Marine

Write About It:

Imagine you are on a fishing trip and you see someone release a non-native animal. Write a letter to that person explaining why that is a bad idea. Don't forget to include what should have been done instead.

Let's Have a Resource Race

A fun activity to see the competition between Invasives and Natives

Items Needed: 3 Buckets, Food (Bird Seed or Corn)

To Start: Divide your group into larger kids and smaller kids. The group with the larger kids will be the “NON-NATIVE” (or “INVASIVE”) species team, while the group with the smaller kids will be the “NATIVE” species team.

Item Placement: 1 bucket (filled with bird seed or corn) will be placed between teams at a starting line. The other 2 buckets placed a short distance away, with one bucket labeled INVASIVE and the other labeled NATIVE.

The Goal: To move food from the starting line (1 bucket) to the 2 labeled buckets, with the objective to have the most food in your team bucket. INVASIVE team members move food only to their bucket. NATIVE team members move food only to their bucket.

To Play: Begin each round with 1 “INVASIVE” and 1 “NATIVE” representative. At “Go”, both team representatives try to move as much food as they can from the main bucket to their team bucket within 30 seconds. Then, the next team representatives subsequently take their turns until all team members on both sides have had a turn.

IMPORTANT GAME NOTES:

- INVASIVE team members may use 2 hands to scoop their food, but NATIVE team members must only use 1 hand.
- The NATIVE team loses one member after all team members have had a turn.
- Then, you play again until all NATIVE team members are out.
- INVASIVE team members can continue to play even if they don't have an opponent.



Crossing the Finish Line

Now that both teams have finished the race, which team had the most food in their bucket? More than likely it was the INVASIVE team, as their advantages (larger size, bigger hands, etc.) helped them win this race.

What this exercise demonstrates to us is size, among other things, can be advantageous to many invasives and allow them to outcompete, or have an advantage over, our native species. Additionally, the loss of natives shows us how invasives can prey upon natives or cause them to leave the area.

The invasives might have won this race, but we can beat them by preventing their introduction!

Name that ANS



S _____
B _____



W _____
H _____



F _____
C _____

N _____
S _____

ANSWERS
Northern Snakehead; Spotted Bass; Water Hyacinth; Flathead Catfish

Are you an Artist?



Each year, the GA DNR partners with Wildlife Forever[®] to support the annual State-Fish Art contest. This contest encourages young artists in grades K-12 to submit original art in a variety of categories. One of these categories, entitled “Invader Crusader,” encourages students to enter artwork that includes both an official state-fish and an invasive species.

For more details, visit www.statefishart.org.

REMEMBER, WE NEED YOU TO HELP:

STOP THE SPREAD!

Help keep aquatic nuisance species (ANS) out of Georgia. Non-native or introduced species present problems for many of our native fish and plant populations. You can help by practicing the **4R's**:

- **Refrain** from relocating fish or aquatic plants to areas which they are not native
- **Remove** any non-native species you catch while fishing
- **Report** any non-native species you encounter to your local fisheries office
- **Remember** to practice CLEAN, DRAIN, and DRY after returning to the boat ramp

Visit georgiawildlife.com/ans to learn more

NORTHERN SNAKEHEAD

ZEBRA
MUSSEL

TIGER SHRIMP

LIONFISH

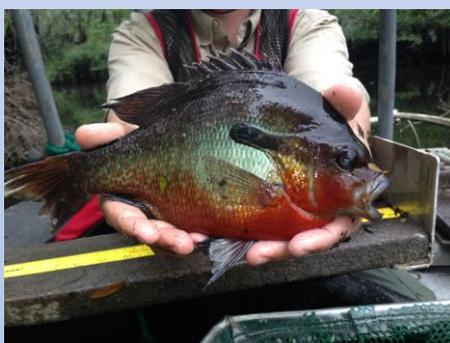
ASIAN SWAMP EEL

ISLAND
APPLE SNAIL

FLATHEAD
CATFISH



With your help, we can protect our native plants and animals for all of us to enjoy!



We wish to extend our appreciation to the following organizations for their ongoing support of ANS education and prevention:



georgiawildlife.com/ans



gaafs.org/education

