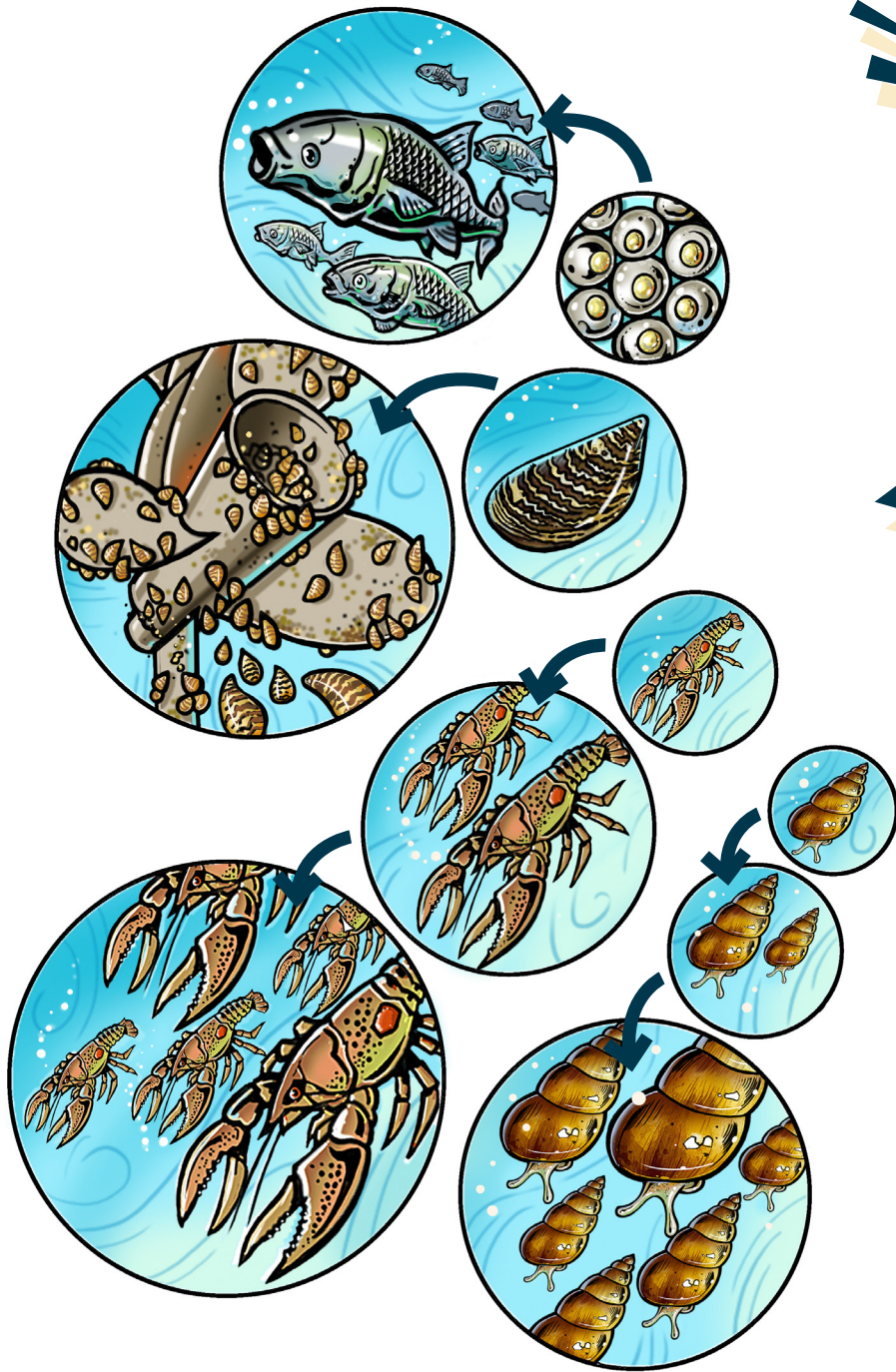


INSPIRE A KID TO PROTECT **WYOMING WATERS**



CLEAN DRAIN DRY
- WYOMING -

inspire
a **KID**
it's for life



AIS HOTLINE

(307) 777-4600
ReportAIS@wyo.gov

Report AIS sightings. The hotline can also answer questions about inspection locations and hours.

Illustrations by Mario Noche

WHAT'S AIS?

AIS STANDS FOR AQUATIC INVASIVE SPECIES

Plants or animals that live in water and are not native to the area can cause harm when they enter a new place. These plants and animals are called aquatic invasive species, or AIS. They are often moved to a new place by people. Sometimes this is an accident, but sometimes it is on purpose. Some animals, like zebra mussels, can attach to boats that move between lakes or streams. Other animals, like fish, are moved by people who want to have them in their local pond.

Invasive species harm their new environment. They eat too many native plants and animals or take over the habitat. AIS cause native species to struggle to survive. Animals like mudsnails can fill up the bottom of a stream. They push native snails and insects out of the area. Invasive crayfish grow big and fast, eating all the food before the native crayfish can.

Many invasive species also can harm structures like dams and water pipes. They can clog the structures, making it hard for water to pass through.

AIS can ruin beaches. Curly pondweed can be dangerous to swim in because it fills the water with long strands of plants. The sharp shells of zebra mussels can cut human and pet feet.

The Wyoming Game and Fish Department works to keep invasive species out of Wyoming. It also tries to manage AIS that have already made their way into the state. Once AIS are in place, it can be very difficult or impossible to get rid of them.

Aquatic invasive species are bad news. Here's the good news — everyone can help stop their spread in and around Wyoming! Make sure your boat, water toys, waders and boots are clean and dry. Never move anything from one water to another. Keep a sharp eye out for invasive plants and animals.

Follow along with the activities in this book to learn how to be a hero by fighting Wyoming's AIS villains!



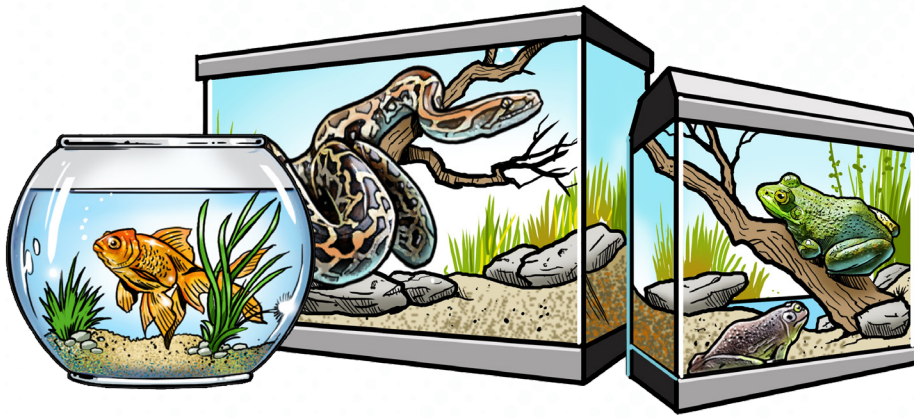
DON'T LET IT LOOSE!

Fill in the blank spaces on both pages before you read the story. Be creative and invite friends to join you!

For many years, _____
person dreamed of owning a goldfish. They always imagined coming home from school to watch their goldfish _____,
action/verb every day. _____'s family, however,
same person often reminded them of the many responsibilities of caring for a goldfish. Responsibilities like cleaning the goldfish's _____
item every week and feeding the goldfish _____
food every day. After _____
same person promised to care for the goldfish responsibly, their family agreed to let them get one. _____
same person was so excited to finally pick up their new goldfish from the store for only _____
number bigger than 100 dollars. It was on sale! Like they were told to do, _____
same person fed their goldfish food daily and cleaned the goldfish's _____
body part every week. Before long, the goldfish was bigger than a(n) _____
something very big.

After _____
number weeks, _____
same person became too busy with _____
activity and forgot to care for their goldfish. The goldfish's tank turned _____
color and smelled like a _____
object. Pee-yew! _____
same person was _____
emotion that they did not care for the goldfish properly and thought it would be happier elsewhere, like in the wild. They decided to let it loose near the _____
location.





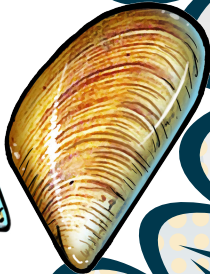
Once the goldfish was loose in the waterway, it grew larger than a _____! As it grew, it became hungrier and hungrier. It ate all the _____, leaving nothing for the native fish to eat. It eventually found another goldfish that had been let loose. Together, they made _____ goldfish in just a few days. The goldfish's large appetite and ability to lay eggs quickly forced the native fish species out of the waterway. It was a villain!

When anglers (people who fish) arrived at the waterway, they realized the goldfish were taking over and their sought-after native fish were nowhere to be found. One of the anglers called a fisheries biologist with the Wyoming Game and Fish Department to tell them the _____ news. Biologists drove to the waterway and used a(n) _____ to remove the goldfish from the water. After removing the goldfish, the native fish came back to the water. ***The fisheries biologist reminded everyone, "Don't let it loose!"***

Sometimes people release pets into the wild when they grow too large or become hard to care for. Those that do may become invasive and cause harm to their new home and the native species within it.

Released pets can harm the environment by growing much larger than they would as pets. They also compete with native species for food and shelter and can spread diseases.

INVADER INFO



ZEBRA + QUAGGA MUSSELS



Adult mussels usually grow to the size of a quarter. Offspring are microscopic, meaning you can't see them without a microscope. They look like the letter 'D' and tend to have stripes like a zebra.



Boaters who do not clean their boats well can bring mussels from one water to another. Mussels can attach to boats and live out of water for up to one month. Once mussels reach a new water they start to reproduce.



Zebra and quagga mussels grow hair-like threads called byssal threads. These allow them to attach to hard surfaces under the water, including hulls of boats. This is one of the main ways they are spread around. One adult mussel can produce 1 million babies every year!



NEW ZEALAND MUDSNAILS



They grow as big as your pinky fingernail and are shaped like an ice cream cone with 4-5 swirls.



Mudsnails can hide in mud, boots, waders and fishing gear. They spread when people use dirty gear in different water bodies.



They reproduce by creating copies of themselves, which is called cloning. This means one snail can start a new population – 300,000 mudsnails can live in a 3-foot square!

KEY!



Size & identifying characteristics



How they spread



Villainous characteristics



CURLY PONDWEED



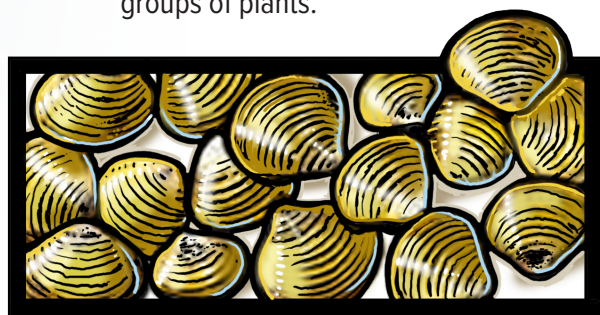
Curly pondweed grows **FAST** — much faster than native plants. It can grow 4 inches per day and up to 15 feet long! Curly pondweed leaves have wavy edges.



The long strands of aquatic plants can get caught in boat motors, anchors and fishing gear.



Aquatic plants grow in shallow areas near beaches and docks. They can fill up swimming areas and prevent recreation. It can be dangerous to swim in dense groups of plants.



CORBICULA CLAMS



These clams grow to about one square inch. They have thick rings along their hard shells and are yellowish-brown.



People move them to eat or by accident. Clams can release thousands of babies every year. The babies float downstream and infest new areas.



These clams use resources like food and oxygen that native species need. Corbicula burrow deep in the sand or mud at the bottom of lakes and rivers.

INVASIVE CARP



There are four kinds of carp listed as AIS in Wyoming: bighead, silver, black and grass carp. These species can weigh 40-50 pounds — similar to a medium-sized dog.



People brought invasive carp to the U.S. for food and to help clean water. Some swim to or are released in new areas.



Invasive carp can spread quickly and use up all the resources other fish need. Silver carp can jump high out of the water when boats are nearby, sometimes hurting boaters.

RUSTY CRAYFISH



They grow to 5 inches long. Their name comes from the bright-red spots on either side of their body, behind their claws.



People often move crayfish to use them as bait for fishing or to keep for later meals. Crayfish can also crawl between water bodies on their own.

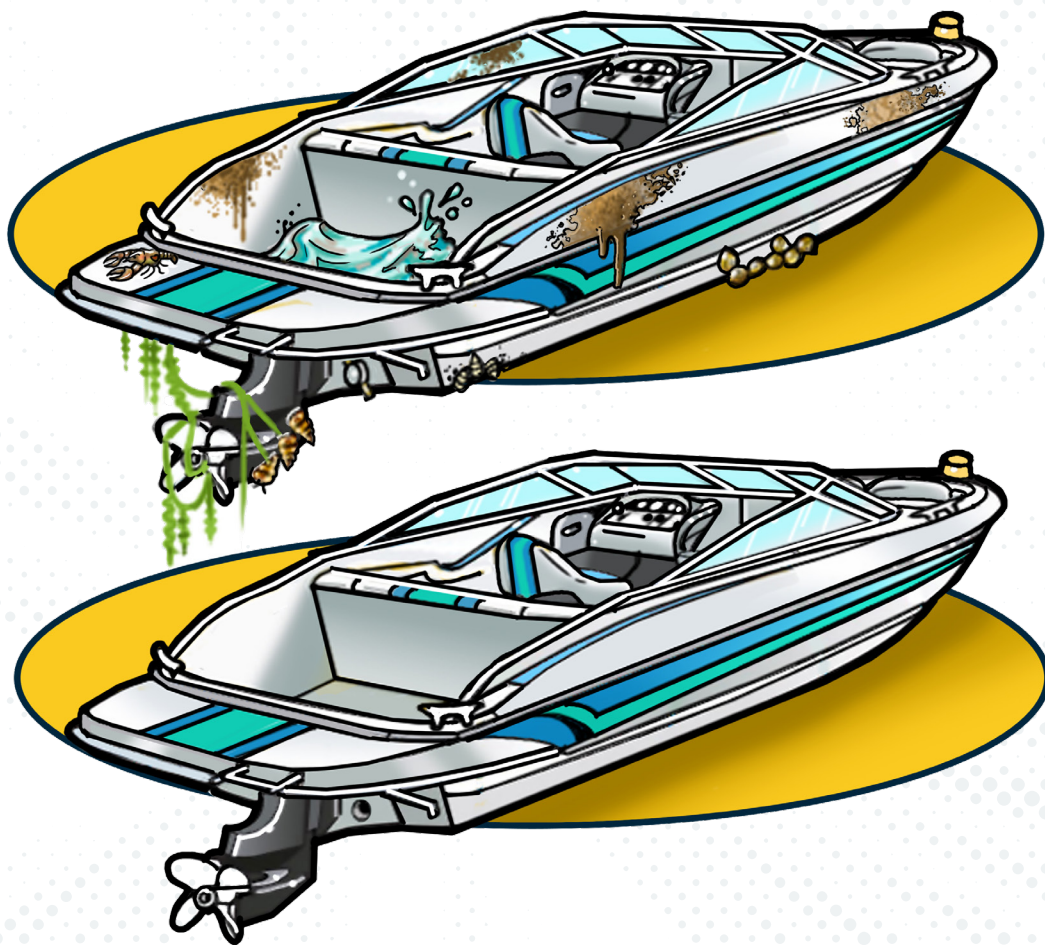


Rusty crayfish grow bigger and faster than native crayfish. They eat lots of different foods, so they can always find a meal!



CHECK THE DECK!

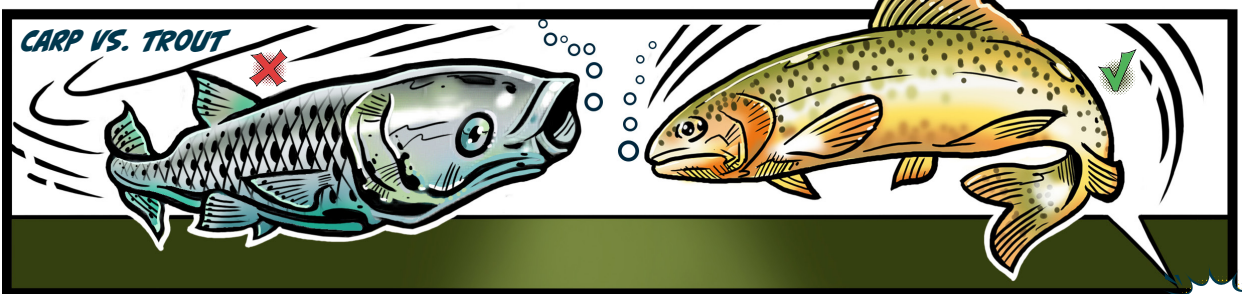
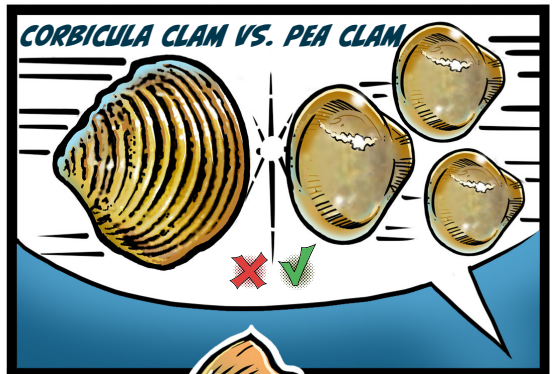
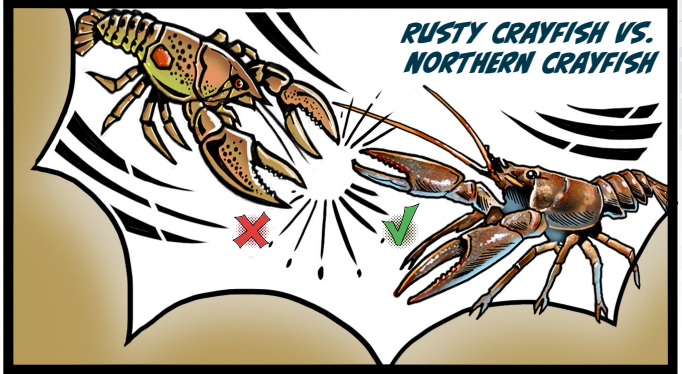
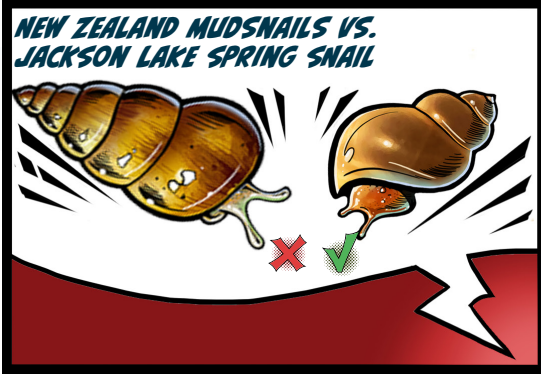
Look at the drawings below. One boat is dirty. The other is **clean, drained and dry**. Can you spot the 11 differences between the boats and identify which boat is ready to launch?



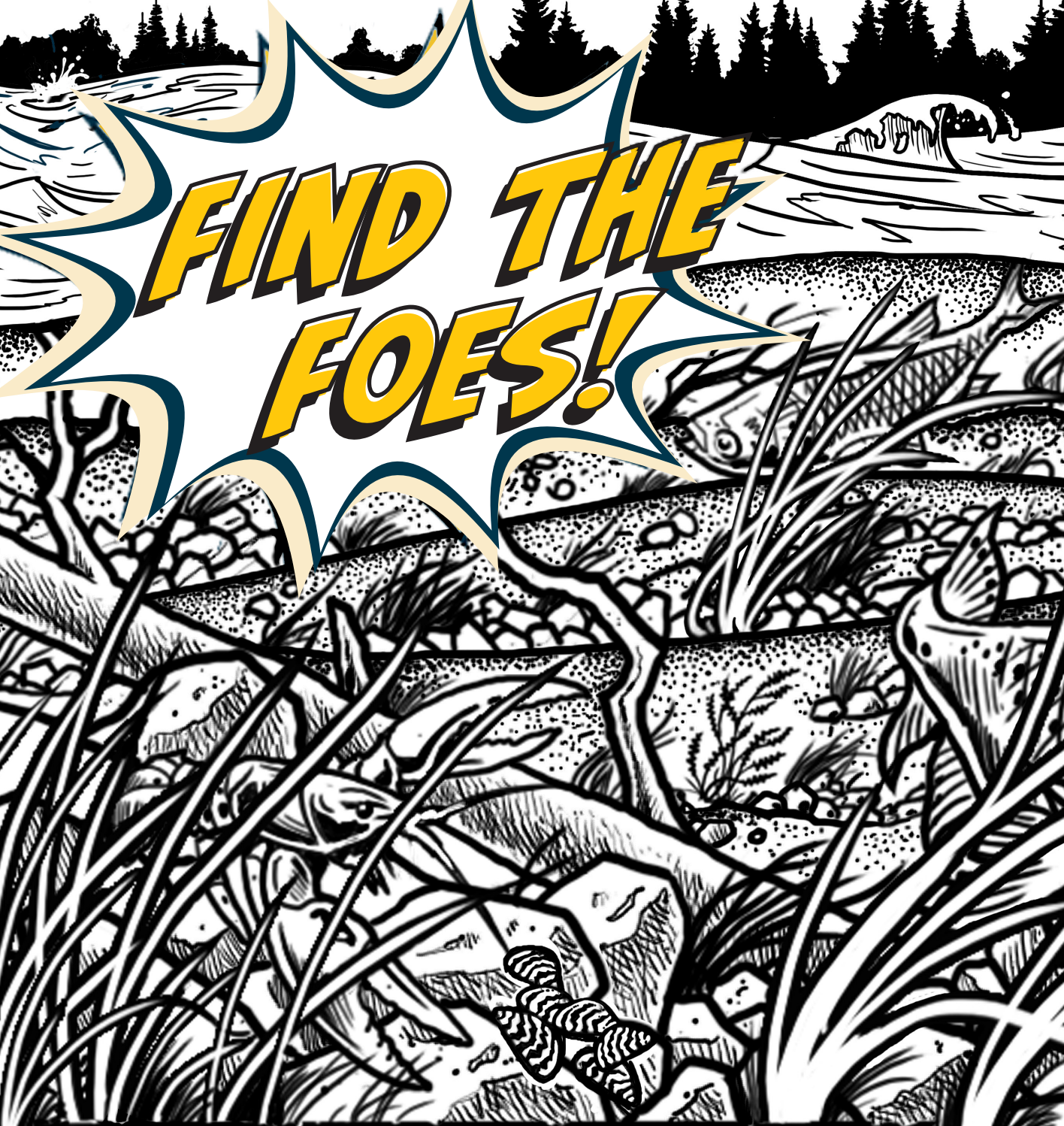
Boats need inspections to make sure they are clean and dry before visiting a new water body. If a boat is holding water, mud or plants, AIS might survive the trip to a new water body and invade more places. Inspectors with the Wyoming Game and Fish Department look at the inside and outside of a boat to check for mussels, plants, water or mud and clean up what they find. Once the boat is clean, drained and dry, it's ready to go into the water.

FRIEND vs. FOE

A few native plants and animals in Wyoming look like AIS. You can stop AIS villains from spreading to and around Wyoming by knowing what they look like. If you see an AIS, tell an adult. If you see a native species, leave it alone. Look at these drawings. Can you see the differences?



FIND THE FOES!



SEARCH AND FIND THESE INVASIVE SPECIES IN THE SCENE ABOVE!

QUAGGA MUSSELS



NEW ZEALAND MUDSNAILS



CURLY PONDWEED



BIG HEAD CARP





**BLACK
CARP**



RUSTY CRAYFISH



**SILVER
CARP**



**ZEBRA
MUSSELS**



INVENT AN INVADER!

DRAW YOUR OWN AIS VILLIAN!

How would you design the most destructive invasive species or villain? Does it clone itself like a New Zealand mudsnail? Grow fast like curly pondweed? Or something else?

Give your invader special adaptations that would help it outcompete native species. Choose one adaptation from each category below to create your own villain. You may also invent an adaptation on your own that suits your villain.

REPRODUCTION

- Cloning:** The ability to reproduce from one organism.
- Vegetative reproduction:** The ability to grow from pieces of a larger organism.
- Mass reproduction:** The ability to reproduce millions of offspring at one time.

APPETITE

- Eats anything that fits in its mouth.
- Eats a large amount of food at one time.
- Absorbs nutrients instead of eating with a mouth.
- _____

GROWTH

- Grows at a rapid speed.
- Grows large in size.
- Finds a hard surface to grow on.
- _____

DEFENSE

- Strong outer shell to protect itself from the elements.
- Hard for other organisms to eat.
- Claws or sharp spikes to fend off predators.
- _____



Scan the QR code to
show off your invader!

MACRO MAYHEM

Gather your friends, family members or classmates and play Macro Mayhem! This game requires some space and **at least five people.**

RULES

1. Assign roles and actions to each player.
 - One person becomes a predator, like a fish.
 - $\frac{1}{4}$ of the players become a caddisfly larva. They must hop with both feet together.
 - $\frac{1}{4}$ of the players become a mayfly larva. They must do three jumping jacks every three steps.
 - $\frac{1}{4}$ of the players become a stonefly larva. They must do two push-ups every two steps.
 - $\frac{1}{4}$ of the players become an aquatic invasive species, like a rusty crayfish. They must run.
2. Together, choose the boundaries of your playing field. A large, open space is ideal for this game.
3. Have the predator in the center, all the other insects, called macroinvertebrates gather on one side of the field.
4. The goal of this game is for the macroinvertebrates to get to the other side of the playing field without being eaten by the predator. Players must show the actions of their macroinvertebrates as they cross the playing field.
5. Invasive species, like rusty crayfish, are difficult for predators to eat and reproduce faster than native species. All macroinvertebrates tagged or “eaten” by the predator become rusty crayfish.
6. Play until all players, except the fish, become rusty crayfish.

QUESTIONS

1.

Which macroinvertebrates survived the predator?

2.

How long did it take for the rusty crayfish to take over?

3.

What happens to the native macroinvertebrates when the rusty crayfish take over?

