Amazing Wetlands

Activity Book

DELAWARE'S WETLANDS

What are wetlands?

You guessed it! Wetlands are areas of **land** that are **wet**. They come in a bunch of different shapes, sizes and types and can be found all over Delaware. All wetlands must have water loving plants, soils that have been soaked, and water on the surface for some part of the year.

Do wetlands have super powers?

You bet! Wetlands have great super powers: they help to clean and **purify** our waters to make them safer to drink and swim in, they **provide** homes for many adult and baby animals like ducks, fish, and turtles, and they also **protect** our buildings and land from flooding by soaking up extra rainfall. Check out the icons below to find out about other wetland super powers.

Wetland symbols

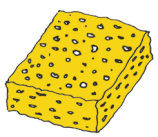
Crib—Nurseries
Wetlands are like nurseries, they are a place where frogs, fish, turtles, birds and other animals can safely rest and play.

Food
Wetlands are a source of food to growing animals, and even us humans.

Soap
Wetlands can act like soap, they can clean water of nutrients like phosphates and nitrates.

Colander
Wetlands can act like a colander, they can trap dirt that is in the water making it more clear and sparkly.

Shield
Wetlands, like a shield, can protect our coastlines from damaging big waves.



Sponge
Wetlands, like a sponge, can soak up extra water and help prevent flooding of homes, land and businesses.

Find out more about Delaware's wetlands at de.gov/delawarewetlands or de.gov/wetlandtoolbox

PRACTICE YOUR CURSIVE HANDWRITING

Connect the dots of the cursive letters, then try your hand at it on your own.

A wetland is wet land.

They have water, soil

that is wet most of the

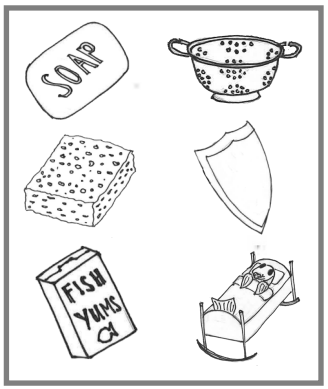
time, water-loving plants.

Wetlands are not always

covered in water.

MARSH METAPHORS SEEK & FIND

Wetlands help you every day. Can you find these wetland symbols hidden in the picture?



Can you find these 10 animals hidden in the picture?

- Fiddler Crab
- Snake
- Salamander
- Fish
- Heron
- Turtle
- Duck
- Frog
- Horseshoe Crab
- Dragonfly

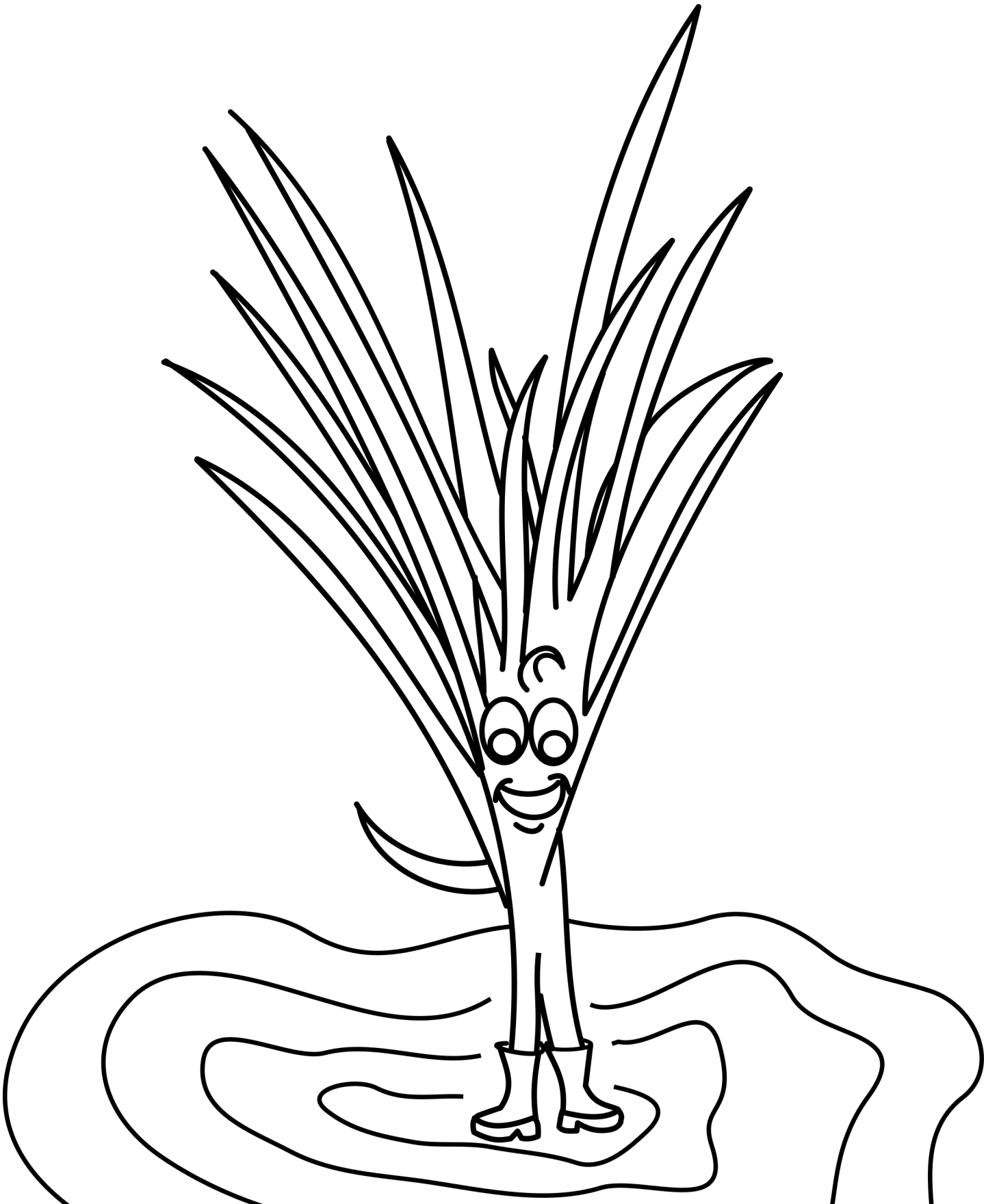
HELP THE MARSH WREN FIND ITS WAY HOME

Marsh wrens are small, have a loud and bubbly song, and certainly aren't afraid to sing it! Their little brown bodies blend in with tall grasses of brackish marshes that they like to perch on, often with each leg on two different grass blades. Their nests are off of the ground and are woven out of grass pieces, creating a sort of elevated basket with a side entrance.

START

COLOR SALTY! THE SALTMARSH PLANT

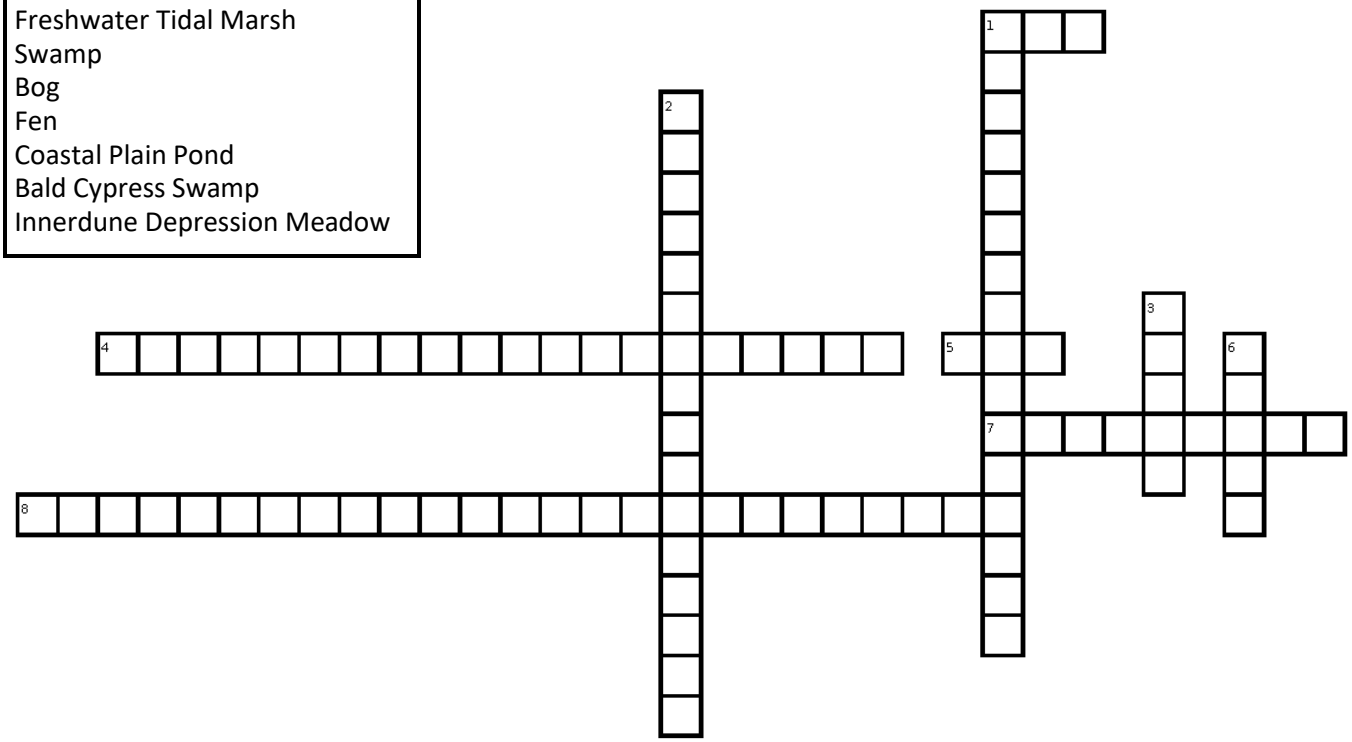
Salty is Delaware's mascot for saltmarshes. He is a smooth marsh cordgrass plant or Spartina alterniflora and calls the many marshes of Delaware home. Research what saltmarshes look like, then draw a saltmarsh background and color Salty.



CROSSWORD: WETLAND TYPES

There are many different types of wetlands. Can you match the descriptions with the wetland types in the word bank?

Word Bank
Marsh
Saltmarsh
Freshwater Tidal Marsh
Swamp
Bog
Fen
Coastal Plain Pond
Bald Cypress Swamp
Innerdune Depression Meadow



Down

1. a freshwater wetland that is dominated by the bald cypress trees, is relatively rare, and pools water for most of the year.

2. small in size, these circular or oval shaped pools of freshwater are in the woodlands and dry up in the summer and fall. They are important habitat to amphibians in spring, and are also called whale wallows.

3. forms in floodplains or other areas that pool water and always have trees, wet soil or standing water.

6. does not have trees, is not always full of water and contain freshwater, saltwater, or a combination of both (brackish). A tidal form of this wetland type is near a body of water like a river, bay or stream and its water level rises or lowers with the tide. An inland form of this wetland type is near a lake or river when the water table is high.

Across

1. only contains freshwater, and are fed by rain water. They exist in northern climates inside lake basins that pool water. The ground feels squishy, like a sponge and is covered by peat, which is decaying plant matter.

4. does not have trees, is not always full of water and contains freshwater. It is near a body of water like a river, bay or stream and its water level rises or lowers with the tide.

5. only contains freshwater, and are fed by groundwater. These types of wetlands are the rarest and contain more plant and animal species than any other wetlands.

7. does not have trees, is not always full of water and contains saltwater or brackish water. It is near a body of water like a river, bay or stream and its water level rises or lowers with the tide.

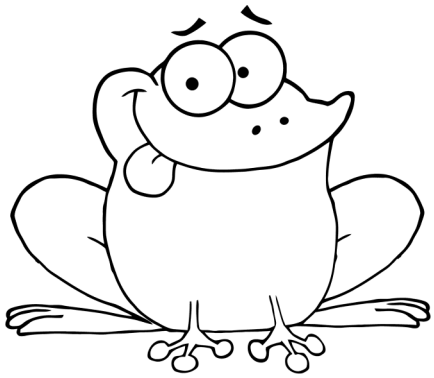
8. you might find these small depression wetlands behind the dunes along select Atlantic coastal beaches.

Hint: Single letters go in the boxes, don't add spaces.

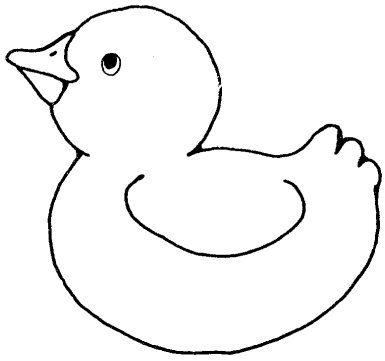
LETTER TRACE & COLOR: WETLAND ANIMALS

Freshwater wetlands are home to all kinds of animals. Trace the dots, spell a word, try it on your own, then color the picture.

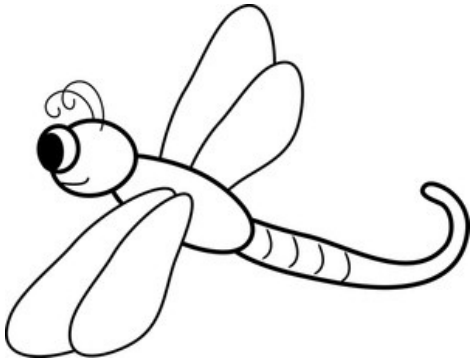
Tree Frog



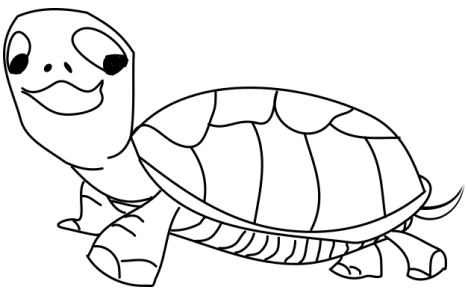
Wood Duck



Dragonfly



Terrapin



WORD SEARCH: MARSH METAPHORS

Wetlands provide many benefits to each and every one of us. Find the words listed below and learn about some of the things wetlands provide for us free of charge every day.

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

CLEANWATER	COLANDER	CRIB
FILTERDIRT	FISH	FLOODPROTECTION
FOOD	HOME	HUNT
KAYAK	NURSERY	PLAY
PRETTY	PROTECTHOMES	SHIELD
SOAKUPWATER	SOAP	SPONGE

COLOR SWAMPY! THE BALD CYPRESS TREE

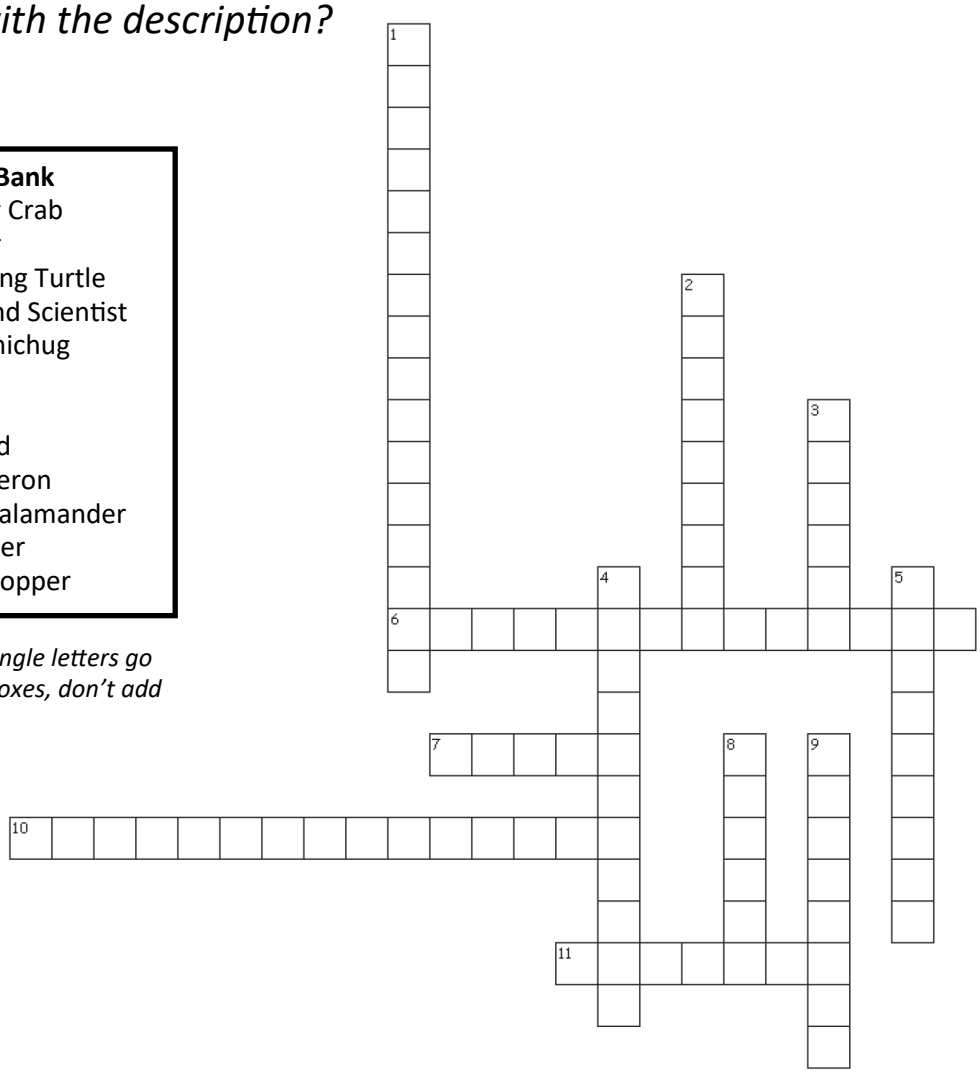
Swampy is Delaware's mascot for freshwater wetlands. He is a bald cypress tree and lives in freshwater swamps. Research what swamps look like and use that information to draw and color in the background and Swampy.

CROSSWORD: WETLAND ANIMALS

All sorts of animals call wetlands home. Can you match the animal in the word bank with the description?

Word Bank
Fiddler Crab
Beaver
Snapping Turtle
Wetland Scientist
Mummichug
Snail
Nutria
Mallard
Blue Heron
Tiger Salamander
Flounder
Grasshopper

Hint: Single letters go in the boxes, don't add spaces.



Across

6. A freshwater animal that has powerful jaws, a grumpy disposition and a hard shell to protect it.
7. This animal has a hard spiral shell to protect it and can spend most of its time sliding around and eating marsh plants.
10. This animal is in water in its larvae form, on land in its adult form and generally has a striped pattern on its body. It likes to live near Coastal Plain ponds and slow moving streams without fish.
11. This bird likes to swim around using its webbed feet foraging for food, the male and females have different coloration with the male having a bright green head.

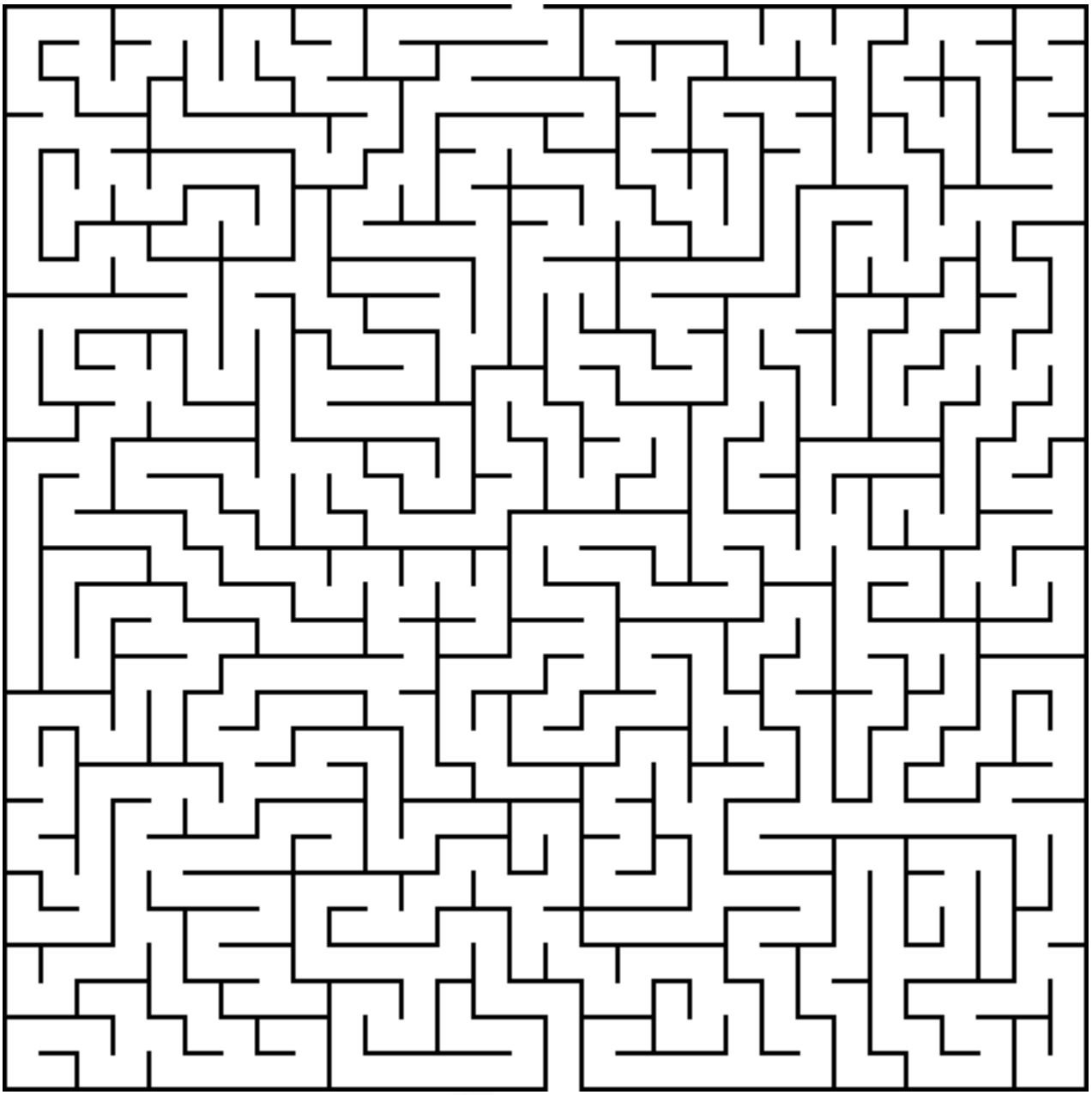
Down

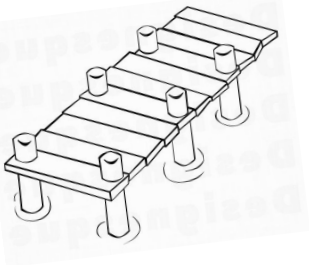
1. This animal spends its time in wetlands of all types studying the impacts of humans and nature.
2. This small fish is an omnivore and spends most of its time in coastal habitats. It is sometime used as a bait fish for catching flounder.
3. An animal that can create wetlands, and has a tail that can be used as: a rudder, an additional leg, lever to drag branches, or slapped on the water as a sign of danger.
4. This critter scurries around the banks of saltmarshes and has one big claw that it waves around to attract a mate. It has ten legs and burrows in the ground to hide from predators.
5. This bird has a long legs and likes to spear fish with its long beak and can swallow a fish that is wider than its narrow neck. It can be found wading in shallow water marshes.
8. This water-loving rodent is an invasive species which looks similar to a beaver. It is known for destroying wetland habitats by eating marsh plants.
9. This fish is flat, has eyes on both sides as an adult and uses wetlands as a safe haven and nursery .

CANOE YOUR WAY HOME

Wetland are great places to explore. Can you help Kenny and Erin find their way back through the tidal wetland to the dock?

START





FINISH

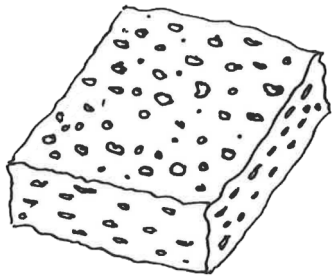
SOMETIME YOU HAVE TO BE THE SUPERHERO

There are many things that you can do to help wetlands: tell your friends and family about them, put trash in the trash can or dumpster, plant a few native plants, or volunteer with your family at an environmental cleanup event.

If you could have a super power to help wetlands, what would it be? Draw yourself as a superhero, and label your super powers!

BREAK THE CODE: WETLAND BENEFITS

Use the code decryptor to break the secret code.



B5 C3 D4 D6 C4 C1 A2 B7 C4 D1 D4 D6 D2 B3 C3

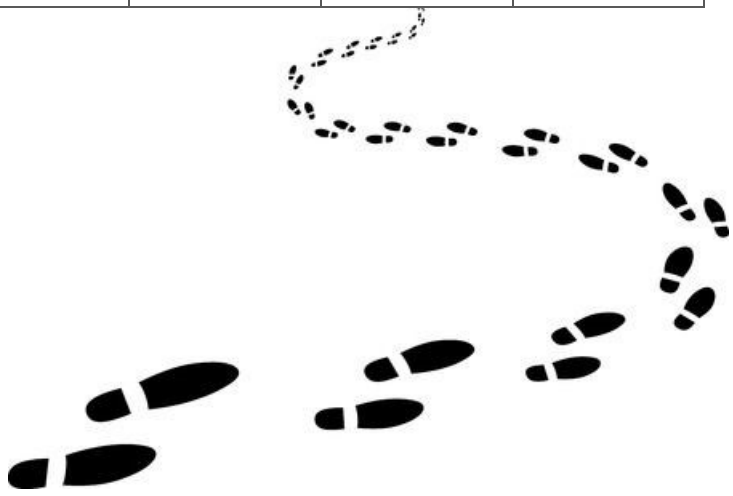
B7 D5 B2 C1 B1 C3 B7 C4 A6 B7 B2 B6 A6 D2 C1 B1

C3 C6 D4 B6 C4 B6 C4 D2 C1 C7 C4 D6 D6 C4 C1 A2

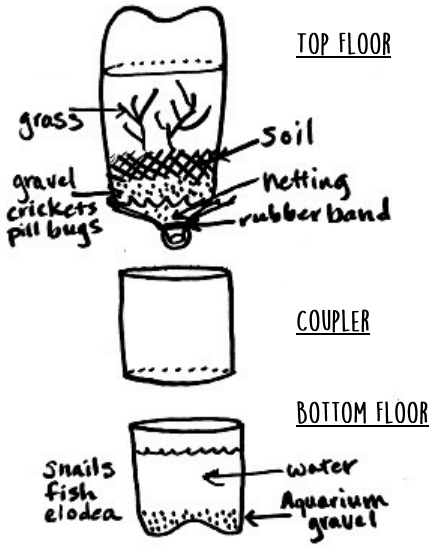
C7 D6 B2 B2 A2 B5 C4 D4 C3 B6 B7

CODE DECRYPTOR

	1	2	3	4	5	6	7
A	J	D	Q	U	H	B	Z
B	G	O	K	M	W	R	S
C	N	R	E	A	Q	X	F
D	C	I	Y	T	P	L	V



SCIENCE AT HOME: WETLAND ECOSYSTEM IN A BOTTLE



Here's what you'll need:

- 3 empty and clear 2-liter bottles
- clear packing tape
- aquarium gravel (or fine, rinsed pea gravel)
- water
- de-chlorinator (optional)
- rubber band
- 4-inch square piece of netting
- soil
- seeds (grass or bean seeds grow easily)
- fish (guppies or small goldfish), snails or other aquatic life
- elodea or other aquarium plants (found at the pet store)
- crickets, pill bugs or earthworms
- dead leaves or small sticks

Prep the Bottles

- Cut the spout off of the first clear bottle (make sure the labels are removed so the sunlight can get through). This will be your **bottom floor** where the water, fish, snails and plants will live.
- Cut the top and the bottom off of the second clear bottle, making a clear **coupler** in the middle that will eventually link the two other sections together.
- Cut the bottom off of the third clear bottle but save it, you'll reattach it with tape after you fill it with the soil and seeds, and it will be your **top floor**.

Stuff the Bottles

Bottom Floor

- In the **bottom floor** put an inch of aquarium gravel and fill it nearly full with water. Make sure it's treated with de-chlorinator to take out the chlorine or, if you don't have any on hand, you can set out the water in a shallow pan for 24 hours and the chlorine will evaporate.
- Once the water is ready, choose your guests and place them in their home on the **bottom floor**! The snails and fish can live quite happily by eating the plants and algae that accumulates in the bottle, keeping the system in balance. The plants help keep oxygen in the water and filter the water.

Top Floor

- Now put together your **top floor**. Place the piece of netting over the neck of the bottle and secure it with the rubber band. With the bottle upside-down and the cut bottom off, fill with about an inch of gravel then with a couple inches of soil and plant your choice of seeds.
- Choose your **top floor** guests. You can use pill bugs, an earthworm or crickets. Let them loose among the seeds and throw in a few dead leaves and a stick or two for decomposition.

Put the Bottles Back Together

- Place the bottom back to your **top floor** bottle making sure the top edge is slightly down inside of the bottom edge. Then tape it together with clear packing tape.
- Slip the taped up **top floor** bottle down into the **coupler**, secure it with packing tape and then slip the bottom edge of the **coupler** down into the top edge of the water-filled **bottom floor**. Secure it with packing tape.

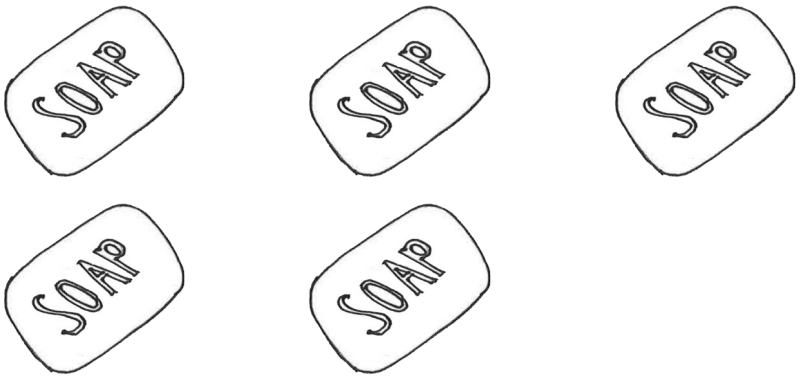
Let it Grow

Place in a well-lit spot where sunlight can get to the plants and let them do their magic. ***Watch your plants grow and keep the waters clean and provide food and shelter for the little critters just like wetlands do in nature!***

HOW MANY?

Count how many soap bars you see and circle the number. Wetlands, like soap, help clean our drinking waters.

1 2 3 4 5 6 7 8 9 10



Count how many cradles you see and circle the number. The cradle represents a baby's nursery. Like nurseries, wetlands provide great areas for baby animals to grow, eat and sleep.

1 2 3 4 5 6 7 8 9 10

COLOR THE SCIENTIST

Scientists in Delaware go out into the muddy marshes to see how healthy wetlands are. They collect data (a type of information) on wetland plants, water and soils. Color in the scientist below, and don't forget to add the mud!

WETLAND ANIMALS: MATCHING HABITATS

Wetland animals create unique homes to help them grow, eat, and survive the cold winters. Can you connect each animal to its home by matching the letter to the animal? Letters can be written in the blue bubbles.

The **Southern leopard frog** lives in wooded wet areas and survives the winter underwater by partially burying themselves in the mud. They live off of extra energy stores within their bodies, and breathe through their skin.

The **red swamp crayfish** is an invasive species in Delaware found in freshwater wetlands. They create burrows underground with a single entrance that is covered by a mud plug or chimney.

The **fiddler crab** lives in Delaware's saltmarshes in mud flats where the water meets the plants. They create elaborate underground burrows for mating, sleeping, and hibernating during the winter.

The **American beaver** is a mammal that lives in freshwater wetlands, and builds its home from sticks. It has thick insulating fur, and stores fat in its tail to survive the winter. As it uses the fat in the tail for energy, the tail gets smaller.

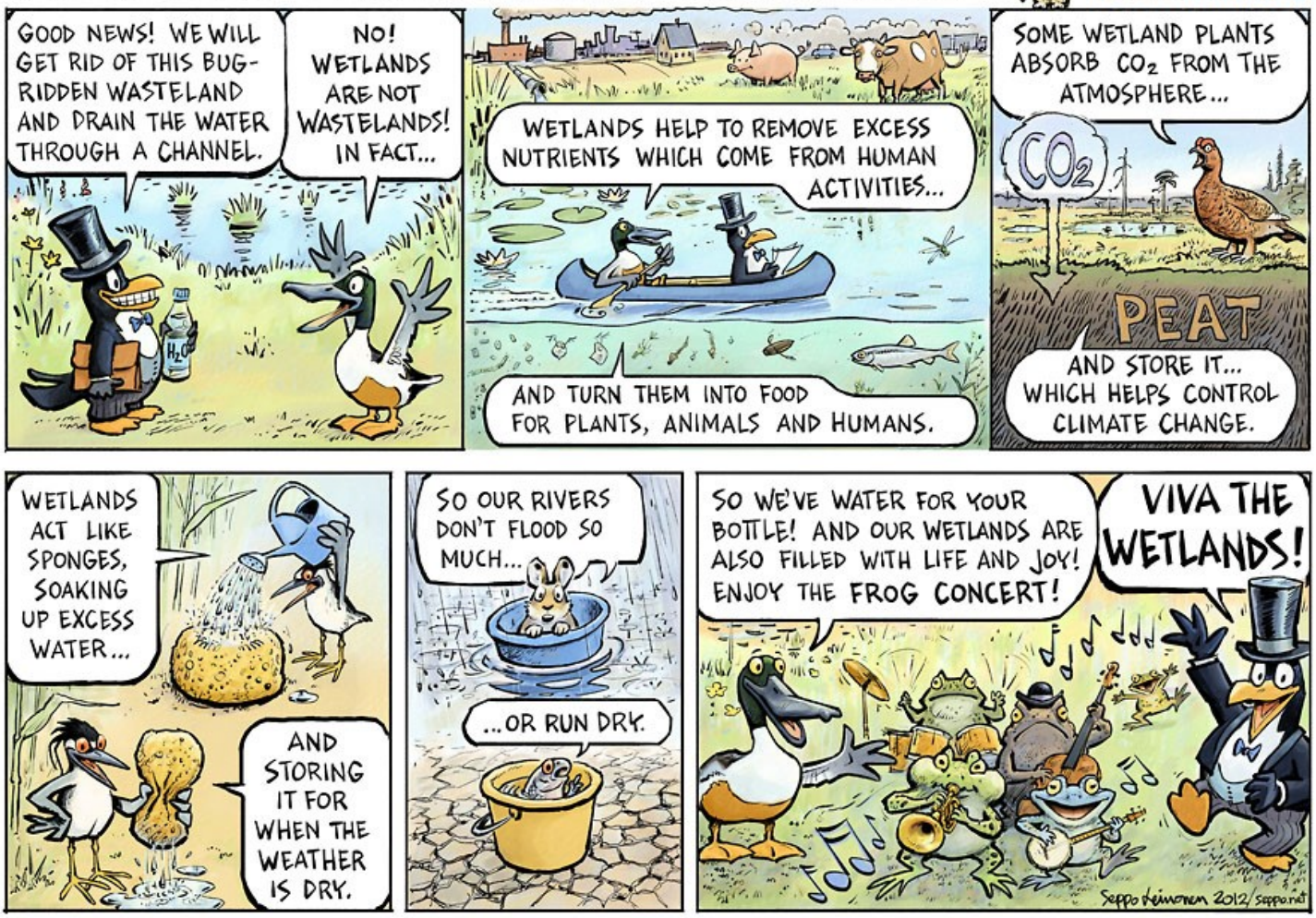
Muskrats are a mammal that live in marshes, and build their homes out of grasses. They can chew off grasses in cold water and stay warm while swimming because their lips seal behind their teeth.

Answers: Southern leopard frog (B), red swamp crayfish (C), fiddler crab (D), American beaver (A), muskrat (E)

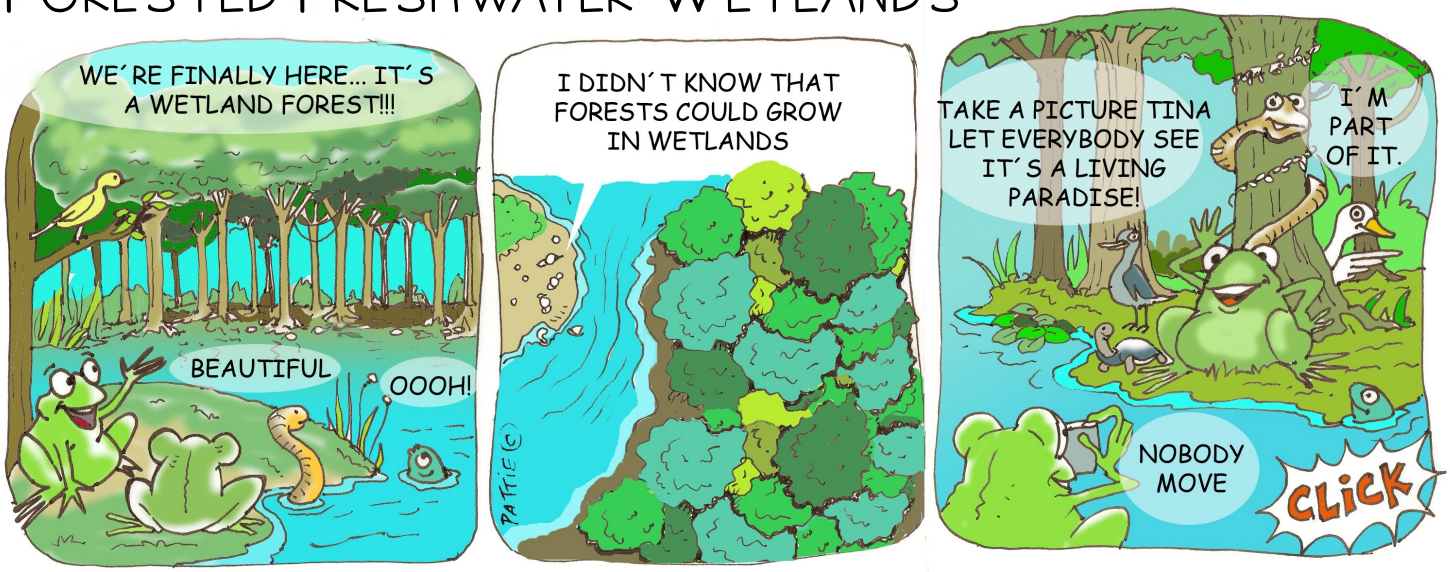
COMIC CORNER

SOME DRY FACTS ABOUT WETLANDS

www.ramsar.org



FORESTED FRESHWATER WETLANDS



AMAZING WETLANDS

IS BROUGHT TO YOU BY:

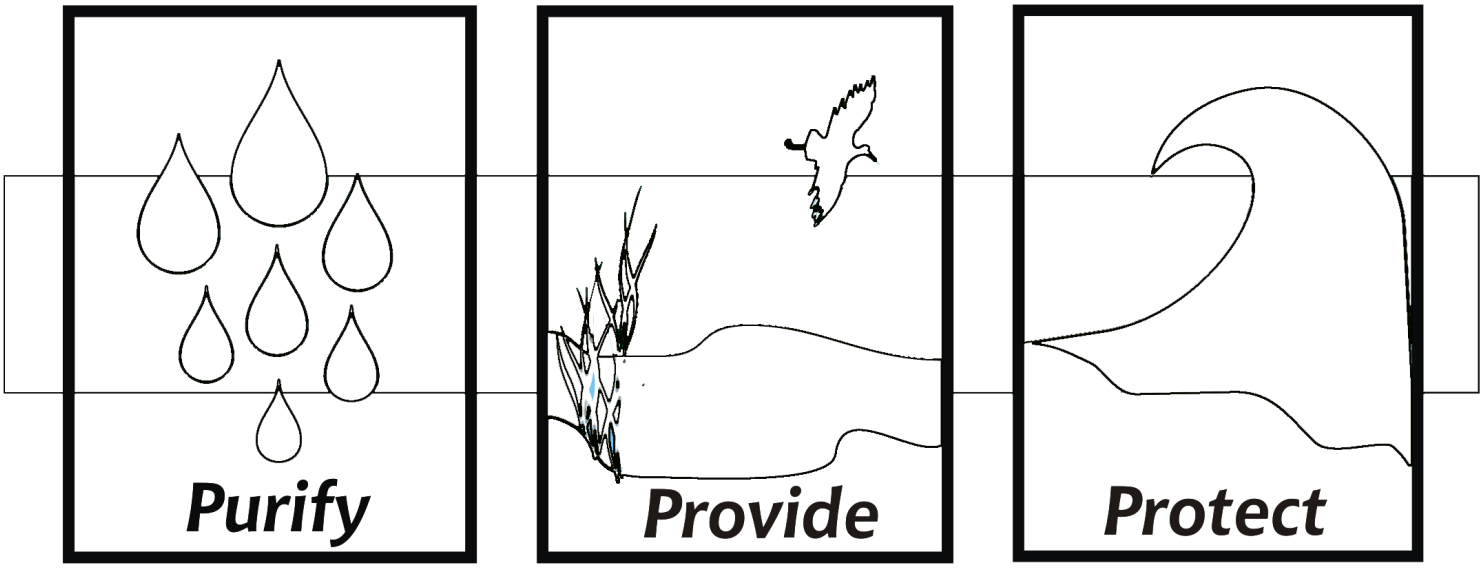
The Delaware Department of Natural Resources and Environmental Control's **Wetland Monitoring and Assessment Program (also known as Delaware Wetlands**).

WMAP provides quality data and reports on the health of Delaware's tidal and non-tidal wetlands, investigates shoreline stabilization and wetland enhancement or restoration methods, and creates education and outreach products to inform and teach the public about Delaware's wetlands.

For more information about Delaware's wetlands or this program, please visit de.gov/delawarewetlands.

Cover cattail and *Spartina spp*. clipart courtesy of Tracey Saxby, IAN Image Library, ian.umces.edu/imagelibrary/

Delaware Wetlands



THE END.