
RHODY
CRITTER KITS
SCALES &
SLIME
RHODE ISLAND
HOPE
FISH & WILDLIFE
DEM
RHODE ISLAND

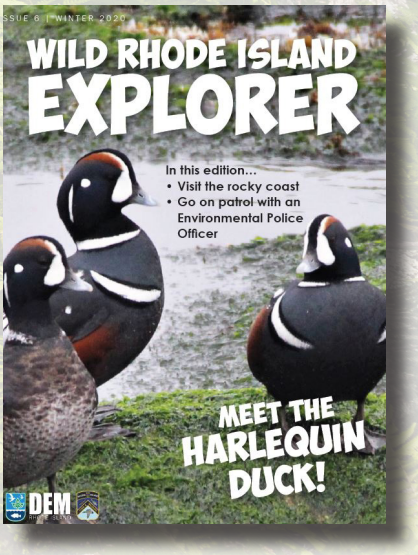
Learn more about Rhode Island's wildlife and our conservation programs!

http://www.dem.ri.gov/programs/fish-wildlife/

Rhode Island Division of Fish and Wildlife Outdoor Education

@RI.fishandwildlife

YouTube Rhode Island Department of Environmental Management



Read, learn, and explore! Sign your school up for a FREE subscription to our quarterly magazine for kids, Wild Rhode Island Explorer. For more information, visit dem.ri.gov/wildlifeoutreach.

RHODE ISLAND FISH & WILDLIFE

DEM RHODE ISLAND

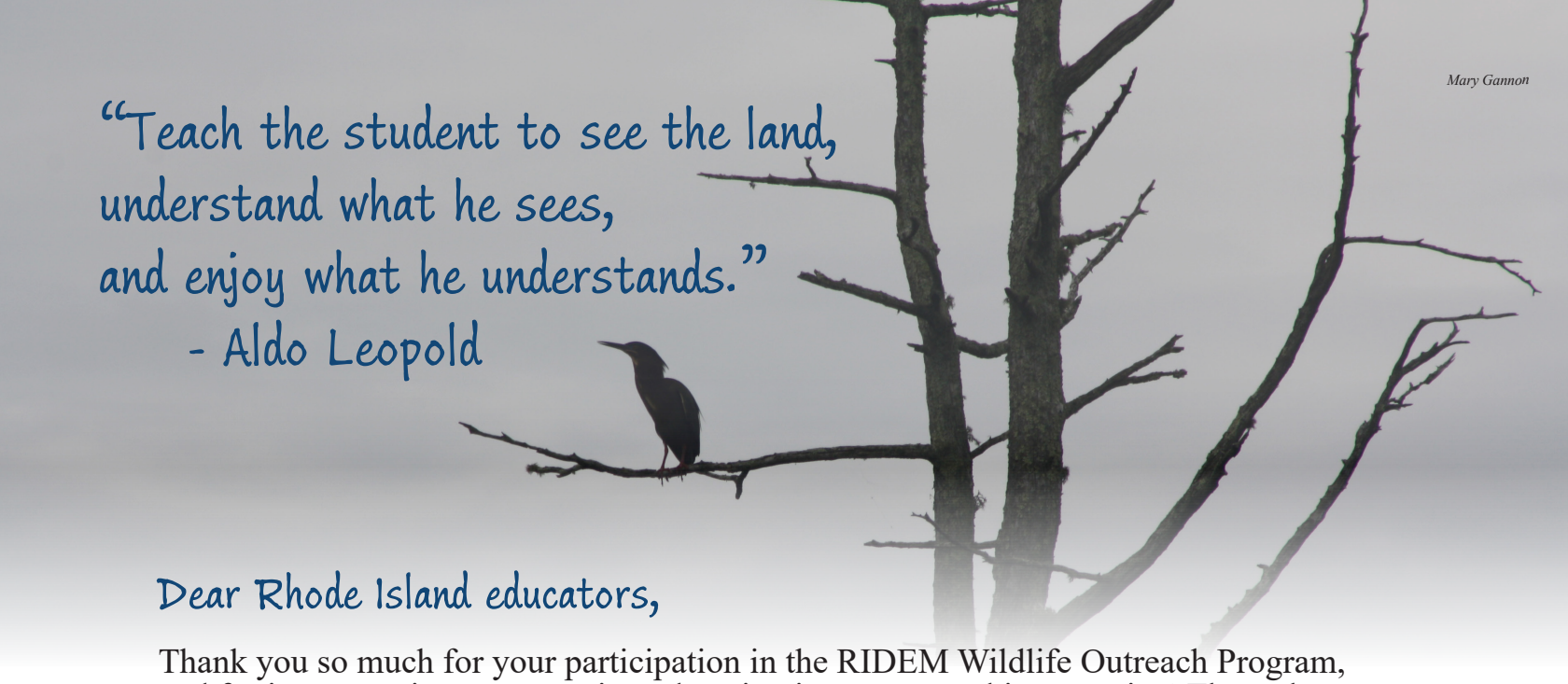
U.S. FISH & WILDLIFE SERVICE

Office of CONSERVATION INVESTMENT

Partnering to fund conservation and connect people with nature

WILDLIFE & SPORT FISH RESTORATION

Cover: Christopher Raithel; Inside cover: Mike Stultz



Mary Gannon

"Teach the student to see the land,
understand what he sees,
and enjoy what he understands."
- Aldo Leopold

Dear Rhode Island educators,

Thank you so much for your participation in the RIDEM Wildlife Outreach Program, and for incorporating conservation education into your teaching practice! Through your participation in this program, you are nurturing the growth of our next generation of environmental stewards and advocating for Rhode Island's diverse and amazing wildlife. On behalf of our wild creatures, big and small, thank you!

The Wildlife Outreach Program has grown in leaps and bounds since its inception in 2017. Coordinating this program has been the most enjoyable and rewarding whirlwind I could imagine. In the wake of the COVID-19 pandemic, our team created these the Rhody Critter Kits to connect with teachers and kids, and keep Rhode Islanders engaged with our natural resources. Now more than ever, it's critical to get children outdoors, engaged with the world around them. It's been a joy to help facilitate these connections and to see this program grow! With your help, we've been able to connect thousands of students from diverse communities to our local wildlife, a feat which could not be accomplished by our tiny team alone.

These kits are not limited just to science lessons, but can be incorporated into art, reading, writing, and social studies lessons as well. We built them with room for flexibility and creativity, so you can tailor them to fit your individual class's needs. We hope the design of the kits inspires you, and encourage you and your students to have FUN with them!

When we create connections to nature in a memorable, enjoyable way, we inspire responsible stewardship and care. As educators, you are incredibly important cultivators of those connections. Every time I meet with educators who have used these kits, I am encouraged and inspired by your dedication. Thank you again!

Best wishes,
Mary Gannon

Wildlife Outreach Coordinator
Rhode Island Department of Environmental Management
Division of Fish and Wildlife

If you have any questions, please do not hesitate to reach out!
Mary.Gannon@dem.ri.gov | 401-782-3700

Gabrielle DeMeillon

Hello wonderful educators!

We couldn't be more excited to introduce you to our Rhody Critter Kit Program! While we always enjoy visiting schools in person, there are only two of us, and so many students who deserve to learn about the interesting and important wildlife that inhabit our state.

Necessity drove us to create these kits, and thank goodness it did. We strive to reach every community in Rhode Island and have now created a fun and interactive way to do so! We all rely on the resources that nature provides and are all responsible for conserving it, no matter our age. Introducing these important concepts to students today will help shape caring and responsible individuals in the future.

The Rhody Critter Kits aim to encourage students to explore the natural world around them with an open mind and observational eye. The resources provided are designed to be adapted to individual class needs, so please use them however you see fit!

Since joining the RIDEM Fish & Wildlife Outreach Team, I have had the opportunity to share our conservation work with students across the state and see their eyes grow wide with inspiration. Seeing misinformation and fear turn into awe and curiosity is one of the greatest transformations to witness. Through these kits, I hope your students are able to learn and grow in the same way. After all, knowledge is the key to growth!

Thank you for sharing in the education of future conservationists through our Rhody Critter Kit Program and we hope you have fun!

Kind regards,
Gabrielle DeMeillon

Biological Technician
Rhode Island Department of Environmental Management
Division of Fish and Wildlife

Gabrielle.DeMeillon@dem.ri.gov | 401-782-3700

About Us


D. Birch

The Division of Fish and Wildlife (DFW) protects, restores, and manages the freshwater and wildlife resources of the state. We share management responsibility of more than 60,000 acres of land, including 25 State Management Areas, and are responsible for thousands of species. We serve a wide and diverse segment of the public from outdoor recreationists (e.g., hunters, hikers, mountain bikers, wildlife watchers) to the general public (e.g., backyard birders, public concerned with nuisance wildlife, municipalities, legislators). In addition, we are responsible for the State's public hunter education programs and overseeing all hunting and trapping in the state. This includes setting seasons, size limits, hunting methods, and daily limits for the harvest of game species like white-tailed deer, wild turkey, waterfowl, and furbearers.


S. Petranca

As part of a larger network of recreational opportunities in Rhode Island, hunting and fishing play an important role in connecting people with nature, supporting quality of life and family traditions, and attracting tourism. Anglers and hunters purchase around 70,000 licenses, permits, stamps, and tags each year and contribute more than $235 million to Rhode Island's economy. Revenue generated from license and permit sales support Rhode Island fish and wildlife conservation programs.

The DFW is primarily funded through the Federal Wildlife and Sport Fish Restoration Program (WSFR), which is administered through the U.S. Fish & Wildlife Service's Office of Conservation Investment. This program uses taxes placed on firearms, ammunition, and archery equipment to help fund avian and mammalian research and conservation programs, habitat acquisition, and outreach and education programs.


C. Raithel

Annual appropriations for WSFR's State Wildlife Grants (SWG) Program provide an additional, smaller, yet less restricted pot of money that can be put toward conservation of all Species of Greatest Conservation Need (SGCN) as identified in the RI Wildlife Action Plan. The list of SGCN includes game and non-game species, and also provides much needed attention to amphibians, reptiles, and invertebrates. It is our goal to responsibly manage and steward our state's wildlife resources, safeguarding them in perpetuity.

Kit Materials

Item	Talking Points
Snapping turtle skull replica	Snapping turtles have a powerful jaw that they use to catch their prey; they eat fish, frogs and any other small critters they can find in the water. Their "beak" helps them to tear their food and can regrow if it is injured.
Snake shed	Snakes shed their skin as they grow. You can tell when a snake is about to shed because its eyes will appear blue. This is because they shed the outer layer of their eyes! Sheds can be identified by their pattern, or lack thereof.
Eastern box turtle shell	Looking at the underside of this top shell, called the carapace, you can see how the spine is fused to the shell. Box turtles have highly "domed" shells, whereas other turtles' shells are flatter.
5-piece frog metamorphosis model *(Eggs, tadpole, tadpole with hind legs only, tadpole with 4 legs, adult frog)*	Frogs, toads and salamanders all go through the process of metamorphosis, where they change from one form to another. This is one of the unique characteristics of amphibians.
Books *All About Turtles* by Jim Arnosky *The Secret Pool* by Kimberly Ridley *Big Night for Salamanders* by Sarah Lamstein	Read these books as an introduction or review for each lesson.
Mini tape measures	Use the tape measures for the Box Turtle Blitz activity. You can also have students compare their height to the length of the black racer shed!
Reptile and amphibian matching cards	Have students flip cards upside-down and try to match the reptiles and amphibians of Rhode Island. You could also distribute the cards and have each student research a species!
Laminated ID Sheets *Reptiles of Rhode Island* *Amphibians of Rhode Island*	Go on a "herp hunt" and look for all the amazing reptiles and amphibians we have in Rhode Island!
Laminated box turtles	Use these for the Box Turtle Blitz activity. You can also use these as models to make your own box turtles with your students.
Laminated reptile true/false cards	Use these for the Reptile Rumors activity.

Eastern hognose snake, Mike Stultz

Scales & Slime

Rhode Island is home to nearly 40 species of reptiles and amphibians, also known as herps! With the materials in this kit, you can introduce your students to these scaly, slimy, and secretive creatures, the conservation work being done to protect them, and how everyone can be a "Herp Hero."

What's included in this kit?

- Information about Rhode Island's herps
- Information on current herp conservation work in Rhode Island
- Resources on how to help herps
- Sample lesson plans
- PowerPoints
- Photos and videos
- Show and tell items
- Fun activities

Next Generation Science Standards

LS1A	Structure and Function
LS2A	Interdependent Relationships in Ecosystems
LS2C	Ecosystem Dynamics, Functioning, and Resilience
LS4C	Adaptation
LS4D	Biodiversity and Humans
ESS3A	Natural Resources
ESS3C	Human Impacts on Earth Systems

Are you using this kit online only?

After using these materials in your classroom, please fill out our feedback form, available on the Rhody Critter Kits page.

Are you borrowing the physical kit?

Please be sure to fill out the feedback form and materials checklist (included in the bin) to ensure all items have been returned.

Bullfrog, Gabrielle DeMeillon

Introduction: What's a herp?

"**Herps**" are what scientists call reptiles and amphibians. Snakes, turtles, lizards, alligators, frogs, toads, salamanders, and newts are all herps! The term herp stems from the Greek word "herpeton," meaning "creeping thing." Most of these animals move slowly and are very secretive as they creep through their habitats.

In Rhode Island there are:

- 20 species of reptiles, which includes turtles and snakes, plus 4 species of sea turtles that visit our coasts
- 18 different species of amphibians, including frogs, toads and salamanders

With this kit, students will act as "herpetologists," studying the behavior, adaptations and threats to reptiles and amphibians and learn how real herpetologists at the RIDEM Division of Fish and Wildlife are helping herps in Rhode Island.

Read on to learn more about herps!

Herp Fun Facts

Number of species	World	United States	Rhode Island
Snakes	> 3,000	50	12
Turtles	356	63	11
Frogs & Toads	~7,200	~90	10
Salamanders	~655	~190	8

Did you Know?

- All herps are vertebrates; they all have backbones (that's right, even snakes).
- Approximately 1/3 of the world's salamander species live in the United States!
- In Central & South America, central Africa, and Southeast Asia, there are some very unique, legless amphibians called caecilians.

Eastern box turtle, Gabrielle DeMeillon

Reptiles

Reptiles are in the **class** Reptilia, this includes turtles, snakes, lizards, crocodilians, tuatara and amphisbaenians (worm lizards). The only reptiles that live in Rhode Island are turtles and snakes. Reptiles are cold-blooded, or **ectothermic**, this means their body temperature is the same as the air temperature. They are also distinguished by their scales that are made of keratin which they shed as they grow. Most reptiles lay eggs, but there are a few exceptions.

Reptiles through the seasons:

Winter: Reptiles, like many other northern animals, don't like to be out during the winter. Since they are ectothermic, the cold weather makes their bodies cold and slow, which makes them vulnerable to predators. So, during the winter, reptiles **brumate**. Similar to hibernation, brumation is when the reptile's body slows down during the winter while they hide in a safe place. Snakes hide in places called **hibernacula**, where the temperature stays above freezing, these are typically under rocks, houses or brush piles. During this time, many snakes, even a mix of different species, will all cuddle together to make it through the long winter months. Turtles spend the entire winter under the water, buried in the mud at the bottom of streams and ponds. They breathe through pores in their mouth and around their **cloaca**. They only require a small amount of oxygen since their metabolism has slowed and they are using very little energy.

Spring: Once the spring arrives, snakes emerge from their hibernacula to seek mates, and turtles come to the surface of the water to heat up. We see reptiles more during this time as they need to **bask** in the sun to keep warm and snakes are traveling more frequently in search of mates. Larger reptiles need to spend more time basking to heat up their bigger bodies, but they retain that heat longer. Smaller reptiles bask for shorter amounts of time, but must do so more frequently since they also lose heat more quickly.

Smooth green snake, Christopher Raithel

Summer: As spring turns to summer, reptiles start to spend less time in the hot sun. Young are born between June and September, depending on the species. Reptiles lay eggs, with a few exceptions in some species of snakes. If the temperature gets too hot, snakes can overheat, so during the summertime, snakes **estivate**. Estivation is like summer hibernation. Snakes will stay under rocks or brush piles in shaded areas where it is cooler. Turtles just hop in and out of the water to maintain the perfect body temperature.

Fall: When autumn peeks its head around the corner, the last of the young are born and reptiles prepare for the long winter ahead. As long as the weather is above about 50ºF, reptiles can be seen soaking up the last rays of sun before returning to brumate once more.

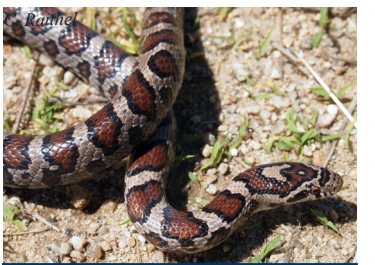
Rhode Island Snake Species

Snakes are fascinating creatures but have long been misunderstood due to myth and misinformation. They are a natural and important part of healthy ecosystems and if left alone, pose no threat to humans. Fear comes from the unknown; by taking time to learn about Rhode Island's native snakes and their habits, this apprehension can be overcome.

Dekay's brown snake
(*Storeria dekayi dekayi*)

Eastern garter snake
(*Thamnophis sirtalis sirtalis*)

Eastern hognose snake
(*Heterodon platirhinos*)



Eastern milk snake
(*Lampropeltis triangulum triangulum*)

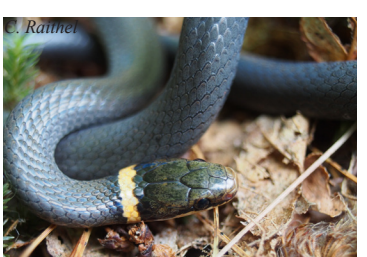
Eastern ribbon snake
(*Thamnophis sauritus sauritus*)

Eastern rat snake
(*Pantherophis alleganiensis*)

Eastern worm snake
(*Carphophis amoenus amoenus*)

Northern black racer
(*Coluber constrictor constrictor*)

Northern red-belled snake
(*Storeria occipitomaculata occipitomaculata*)



Northern ring-necked snake
(*Diadophis punctatus edwardsii*)

Northern water snake
(*Nerodia sipedon sipedon)*

Smooth green snake
(*Opheodrys vernalis*)

For detailed information about each species, check out the Snakes of Rhode Island fact sheet from RI Division of Fish and Wildlife.

A note on VENOMOUS snakes:

There are no venomous snakes in Rhode Island. Timber rattlesnakes (*Crotalus horridus*) were once found in Rhode Island but disappeared nearly fifty years ago. While rattlesnake populations still exist in surrounding states, they do not occur close to the RI border. Copperheads (*Agkistrodon contortrix*) are also found in southern New England, but have never been documented in Rhode Island.

Cottonmouths (*Agkistrodon piscivorus*), also called "water moccasins" are a southern species, occurring no farther north than Virginia, and are unable to survive in northern climates. They are often confused with our native, non-venomous, northern watersnake (*Nerodia sipedon sipedon*), which can appear to have a triangle-shaped head, similar to cottonmouths.

Rhode Island Turtle Species

Turtles are one of Rhode Island's most charismatic animals. They are typically well loved and appreciated, but their needs are not often well understood. Habitat loss, fragmentation and poaching threaten our native turtles. Seven species of turtles live in Rhode Island, some spend their lives in freshwater ponds and streams, while others live almost entirely on land. Four species of sea turtles visit our coasts, Kemp's ridley (*Lepidochelys kempii*), leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*) and green sea turtle (*Chelonia mydas*). All of the turtles that spend even a fraction of their lives in our state depend on us to protect their populations and their habitats.

Eastern box turtle
(*Terrapene carolina carolina*)

Eastern painted turtle
(*Chrysemys picta picta*)

Common snapping turtle
(*Chelydra serpentina*)

Northern diamond-backed terrapin
(*Malaclemys terrapin terrapin*)

Spotted turtle
(*Clemmys guttata*)

Eastern musk turtle
(*Sternotherus odoratus*)

Wood turtle
(*Glyptemys insculpta*)

For detailed information about each species, check out the Turtles of Rhode Island fact sheet from RI Division of Fish and Wildlife.

Help stop turtle poaching in Rhode Island!

The native turtle species of the Northeast are facing a new threat – poaching! Removing even individual turtles can have permanent consequences for populations already under tremendous pressure. It is against Rhode Island law to possess or remove any native amphibian or reptile from the wild. Here's how you can help:

What to look for:

- Individuals with bags poking around in fields, wetlands, or along streams, or flipping over logs and rocks.
- Unmarked traps set in wetlands. A trap set for research purposes will be clearly labeled.
- Cars parked near forested areas with collection equipment - like nets, containers, and pillowcases - visible inside.
- Unattended backpacks or bags left in the woods, along a trail, or near roads.

What to do if you see something suspicious:

- Maintain a safe distance and protect yourself.
- Note your exact location, and **call the 24-hr RIDEM Law Enforcement hotline (401-222-3070)** when it's safe to do so.
- If you are safe, try to take photographs that can corroborate your report. For example, the license plate of a car, or the serial number on a turtle trap.

What not to do:

- Do not confront suspicious persons, or try to stop a crime yourself. Leave that to law enforcement professionals.
- **The U.S. Fish and Wildlife Service also has an anonymous tip line: 1-844-FWS-TIPS (397-8477).**

Pickerel frog, Dean Birch

Amphibians

Amphibians are in the class Amphibia. This includes frogs, toads, salamanders, newts and caecilians. In Rhode Island we have frogs, toads, salamanders and one species of newt. Amphibians are ectothermic, their body temperature depends on the air or water temperature. They spend part of their lives in the water and part of their lives on land, so they have a lot of unique adaptations that help them to survive. Amphibians undergo **metamorphosis**, where they change from egg, to **larva** with gills, to full grown adults. Amphibians are **indicator species**, meaning that looking at the health of their populations, we can tell the health of the ecosystem. This is due in part to their **permeable** skin, which absorbs nutrients from the water they live in. Unfortunately, this also means they can absorb harmful chemicals in the water which can cause developmental abnormalities or death, alerting scientists to the fact that something is wrong in the environment.

Amphibians through the seasons:

Winter: Since amphibians cannot tolerate the cold weather, they have developed very interesting strategies for surviving freezing temperatures. Some amphibians are more **terrestrial** than others, meaning they are able to spend longer periods of time away from the water. Wood frogs, gray tree frogs, peepers, toads and salamanders fall into this category, and they have all developed unique ways to make it through the colder months. Some, more terrestrial frogs, are capable of freezing solid and thawing when the weather warms. Salamanders and toads will dig holes or hide under logs beneath the frost line, in what's called a hibernacula. Their bodies slow down and they enter a period of dormancy called brumation, similar to hibernation. Other, more aquatic frogs, like green frogs and pickerel frogs also brumate, but they rest at the bottom of ponds and wetlands. They breathe through the pores in their skin, taking the oxygen right out of the water. Bullfrogs, and some salamanders, will spend years in their tadpole form, even throughout the winter, this allows them to grow larger than the other tadpoles, giving them an advantage over other amphibian larvae.

Marbled salamander, Mary Gannon

Spring: Spring is the optimal time to view and hear amphibians. The first to emerge are spotted salamanders and wood frogs. These two species lay their eggs in **vernal pools**, small temporary wetlands, filled by rainwater and snowmelt. Many other amphibians follow close behind in mating and egg laying. Frogs and toads sing loudly on warm rainy evenings to attract mates.

Summer: Gray tree frogs and bullfrogs lay their eggs in the early summer. Most other amphibians are hiding in estivation during this time. Trying to maintain moisture in the dryer months, amphibians will crawl beneath logs and leaf litter. As summer draws to a close, many amphibians complete metamorphosis, changing into miniature versions of their adult form.

Fall: While most amphibians are looking for a nice place to spend the winter around this time, marbled salamanders are getting ready to lay their eggs. To get ahead of the rest, marbled salamanders lay their eggs in small divots or under logs around September and October. The female will stay with her eggs to keep them moist until the autumn rain comes and fills up the hole. The eggs hatch and develop quickly. When the rest of the amphibians are laying eggs the following spring, the marbled salamander larvae will have an abundant food source.

What's a "frogsicle?"

Wood frogs, spring peepers, and gray tree frogs all exhibit freeze tolerance. Their bodies produce a natural antifreeze (typically glucose) in their heart and liver which lowers the freezing point of these organs. As the temperature drops further, eventually their heart will stop beating and their body will totally shut down. When the weather warms up again, the first thing to thaw is the heart, which begins pumping blood around the body until the frog is completely thawed! They can repeat this process over and over freezing and thawing throughout the winter, as needed.

Rhode Island Frog & Toad Species

While most people think frogs and toads are the same, they are actually quite different. Both are amphibians, spending part of their lives in the water, but most toads only return to the water as adults to lay eggs. Rhode Island has seven species of frogs and three species of toads. The most apparent difference between frogs and toads is the mucus covering on frogs that protects their smooth, permeable skin from drying out. Toads have bumpy skin that is more tolerant of dry conditions. Toads also have paratoid glands, which frogs lack, located on the back of their heads. These glands produce a toxic substance that deters predators from eating them. Though unique in their adaptations, both frogs and toads are greatly impacted by habitat loss and fragmentation caused by development.

American bullfrog
(*Lithobates catesbeianus*)

Eastern American toad
(*Anaxyrus americana*)

Gray tree frog
(*Hyla versicolor*)

Northern leopard frog
(*Lithobates pipiens*)

Pickerel frog
(*Lithobates palustris*)

Spring peeper
(*Pseudacris crucifer)*

Wood frog
(*Lithobates sylvaticus*)

Eastern spadefoot toad
(*Scaphiopus holbrookii*)

Fowler's toad
(*Anaxyrus fowlerii*)

Green frog
(*Lithobates clamitans*)

For detailed information about each species, check out the Frog & Toads of Rhode Island fact sheet from RI Division of Fish and Wildlife.

Rhode Island Salamander Species

Salamanders and newts have very unique life-cycles. Some salamanders only lay eggs in vernal pools in late winter, some protect them under logs in the fall, some move from water to land and back to water once more. Salamanders are not lizards. They start their lives with gills, move onto land and have permeable skin, defining them as amphibians, not reptiles. With eight species of salamanders in Rhode Island, including the remarkable red-spotted newt, each has its own distinctive adaptations that help it to survive. Most salamanders share similar diets, eating insects and other small terrestrial invertebrates. Tadpoles typically feed on algae, however, marbled salamander tadpoles are known predators and will eat the eggs and larva of other amphibians.

Eastern red-backed salamander
(*Plethodon cinereus*)

Four-toed salamander
(*Hemidactylium scutatum*)

Marbled salamander
(*Ambystoma opacum*)

Northern spring salamander
(*Gyrinophilus porphyriticus*)

Northern dusky salamander
(*Desmognathus fuscus*)

Spotted salamander
(*Ambystoma maculatum)*

Eastern red-spotted newt
(*Notophthalmus viridescens*)

Northern two-lined salamander
(*Eurycea bislineata*)

For detailed information about each species, check out the Salamanders of Rhode Island fact sheet from RI Division of Fish and Wildlife.

Northern spring salamander, Christopher Raithel

Threats to Herps

Habitat Loss and Fragmentation

The biggest threat to reptiles and amphibians, similar to many other animals, is habitat loss and **fragmentation**. While Rhode Island's herps live in a variety of habitats, it is essential that these habitats are connected to allow animals to safely access the resources they require. Fragmentation increases road mortalities, killing snakes, turtles, frogs and salamanders as they attempt to cross the road to reach isolated sources of food and shelter.

Disease

Snake Fungal Disease (SFD) is a newly emerging pathogen that causes dermatitis or skin lesions in snakes, and can lead to death in many snake species. Chytridiomycosis is an infectious disease caused by the chytrid fungus (*Batrachochytrium dendrobatidis*) that has devastated amphibian populations world-wide. The chytrid fungus causes thickening of the normally permeable skin, disrupting an amphibian's ability to absorb water and breathe. This disease has caused declines in over 500 frog and salamander species. Ranavirus is an infectious disease affecting reptiles, amphibians and fish with up to a 90-100% mortality rate. There are several different kinds of ranavirus that impact species at different levels. This disease is believed to be responsible for many recent massive mortality events around the world and, unchecked, could eliminate entire species.

Disease Prevention:

The greatest risk with all of these diseases is transfer to new, uninfected, populations. To avoid spread of these diseases, all equipment should be bleached and scrubbed in a 3% bleach solution before entering a wetland and between wetlands. This includes boats, paddles, shoes and anything else that comes into contact with the water. **Never relocate an animal, it is illegal and can transfer disease to new locations.**

Human Conflict:

Although snakes are incredibly beneficial in pest control, many people fear snakes and would rather kill them than learn to live with them. It is illegal to kill snakes and attempting to do so only increases the chance of being bitten.

Turtles are often taken from the wild and brought home as pets or gathered in massive numbers to be sold in the pet trade. These kidnapped animals can become malnourished and are discarded back into the wild after a few months of "fun." Taking turtles or their eggs from the wild hurts our native turtle populations, which are already fighting to survive against many other threats.

Reptiles and amphibians are also harmed by pollution to their habitats. Runoff from roads and pesticides from lawns can transfer toxic chemicals into adjacent wetlands, harming the sensitive plants and wildlife found there.

Subsidized predators such as cats, raccoons and foxes prey on reptiles and amphibians, and the more predators there are, the more pressure there is on herp populations. Unnatural, human-supplied sources of food, water and shelter are provided through houses, compost piles, garbage cans and pet food dishes left outside. As more humans inhabit an area, unintentionally providing these resources, populations of subsidized predators increase, sometimes growing to numbers higher than the ecosystem can support. There needs to be a balance of predators and prey to keep the ecosystem healthy. Cats should be kept indoors and everyone in the community must do their part to remove human-supplied food sources.

Eastern spadefoot toad, Christopher Raithel

Herp Conservation in Rhode Island: Operation Spadefoot

What is a spadefoot?

Eastern spadefoot toads are one of the strangest and most secretive amphibians in Rhode Island. These unique toads are recognizable by their vertical, cat-like pupils. They spend the majority of their time living underground, using shovel-shaped spurs on their hind feet to dig down into sandy soils, hence the name "spadefoot." They breed in vernal pools, but unlike wood frogs and spring peepers, they are extremely picky about the weather. Spadefoot toads favor downpours and warm temperatures. If the conditions aren't perfect, they will wait several years to emerge from the ground and reproduce.

Why are we concerned about spadefoot toads?

The Eastern spadefoot toad is listed as a Species of Greatest Conservation Need in the Rhode Island Wildlife Action Plan. Their unique life history, combined with all of the other threats to amphibians like habitat loss and fragmentation, has resulted in severe declines in spadefoot toad populations in Rhode Island. To ensure that this charismatic critter does not disappear from Rhode Island, we've launched Operation Spadefoot!

What is Operation Spadefoot?

Operation Spadefoot is a collaborative initiative between RIDEM Division of Fish & Wildlife, the University of Rhode Island, Roger Williams Park Zoo and the Rhode Island Natural History Survey to create more habitat for these quirky critters. With the help of many volunteers, and our partners, we're working to create new vernal pools in sites that would be appropriate for spadefoot toads. Together, we dug out a large hole in sandy soil with shovels and a backhoe, lined it with a giant tarp and waited for the rainwater to fill it up, creating an artificial vernal pool. To make it a little more inviting, we planted native vegetation around the edges. By chance, our friends at the U.S. Fish and Wildlife Service found spadefoot tadpoles struggling to stay alive in a quickly evaporating puddle...in the parking lot at one of their visitor centers! We scooped up the little guys and released them into the recently completed vernal pool. This new generation of spadefoots will help boost Rhode Island's population, giving spadefoots a fighting chance! Plans for creating even more spadefoot pools are underway. Each year, our staff conduct eye-shine surveys at night to search for spadefoots. By flashing a headlamp at the forest floor, biologists can detect toads by the reflection from their big eyes!

Northern diamondback terrapin, Liam Corcoran

Herp Conservation in Rhode Island: Northern Diamondback Terrapin Monitoring

Why are diamondback terrapins so special?

Diamondback terrapins are beautiful turtles, quite unique in their appearance and choice of habitat. They live in estuaries, where saltwater meets freshwater. They bask on salt marshes and nest in sand and dirt in the surrounding uplands. In the early 1900s, these animals were highly valued as a food source. They were collected in large numbers and used to make turtle soup or poached and sold in the pet trade. Diamondback terrapins were harvested so heavily that they nearly disappeared, and at the same time, their habitat was slowly disappearing as houses were built close to the water, destroying their crucial nesting grounds. They are a Species of Greatest Conservation Need and are listed as endangered in Rhode Island, but the Division of Fish and Wildlife and many others are working hard to protect them.

How are we helping these turtles in Rhode Island?

Barrington locals discovered these rare turtles nesting on a farm, and together they decided to do everything in their power to help them. In 1990, they formed the Barrington Land Conservation Trust and they have been protecting terrapin nests and hatchlings ever since. The RIDEM Division of Fish and Wildlife has joined this effort and, with the help of a "turtle drone," has discovered new populations in other areas of the state. Our state herpetologist monitors these populations through visual observations, counting the number of turtles seen, and by trapping and marking them. Turtles are given a small file mark on their carapace (top of their shell), receive a PIT tag and are released. A PIT tag is similar to a microchip that many pet owners have placed under the skin of their dogs and cats. It has a unique code that can be read with a special device. So, if we catch the same turtle twice, we can tell just by waving the wand over the leg where the tag is located, and we don't double count it. All of these measures allow us to monitor how diamondback terrapins are doing in our state and give us a better idea of how we can help them.

Volunteers also help us detect terrapins by surveying coastal areas with binoculars in search of terrapin heads popping up out of the shallow water. In recent years, we've discovered new terrapin sites across the state thanks to the sharp eyes of many volunteers!


Milk snake, Christopher Raithel

How can I help herps?

Road Crossing

We know that one of the biggest threats to amphibians and reptiles is fragmentation. It's difficult for a turtle or frog to cross wide, busy roads, but sometimes they need to in order to reach the resources they depend on to survive. If you find one of these little friends trying to cross a road, follow these steps:

Step 1: For students, make sure you have an adult with you and it is safe to help. Pull over in a safe location and turn on the car's emergency flashers. Be aware of traffic.

Step 2: Gently pick up the herp.

- Frogs may jump, so hold them close to the ground.
- Small snapping turtles can be picked up by the back of the shell but be careful of their flexible necks. Large snapping turtles can be pushed across with a shovel or stick.

Step 3: Move the animal to a safe place, a few feet off the side of the road **in the direction it was headed.**

- **Never** move an animal far from where it was found. They are familiar with this area and know places to eat, drink and hide here.
- **Never** take a wild animal home with you. It is against the law in Rhode Island and is not being safe or kind with the animal.

Step 4: Give yourself a high-five, you just saved a critter!

Stop the Spread of Disease:

Reptiles and amphibians are both at risk of contracting several diseases. Amphibian populations are under severe stress from Ranavirus and Chytrid Fungus, which have devastated amphibian populations around the world. These diseases can be spread on our boots, paddles and other gear that we use in ponds, streams and rivers. To help keep Rhode Island populations healthy, you can sanitize your gear, just like real herpetologists do while working in the field. For steps on how to disinfect gear, click here.

Clean Up and Protect Wetlands:

There are four resources that all living things need to survive: food, water, shelter and space. These four things make up an animal's habitat, or home. Habitat loss is the greatest threat to all reptiles and amphibians, without a complete habitat, they cannot live. Cleaning up a pond or stream can be turned into a fun and helpful activity that you can do on your own or with friends. Bring a trash bag on your next outing and pick up litter as you explore. Everyone, big or small, has a voice, and you can help decide what happens with our wetlands. Do some research and find out how you can help protect a herp habitat near you.

Spread the Word: Herps are Awesome!

One of the most important, and easiest things you can do is to share what you've learned with your friends, family and neighbors. Tell them how cool and interesting reptiles and amphibians are! Tell them how snakes help keep rodent populations in check, preventing disease. Explain how amphibians are indicator species and can reveal the health of a wetland because of their permeable skin. Teach them how they can help by disinfecting their gear and looking out for herps crossing the road. Use your knowledge and your voice to help protect Rhode Island's reptiles and amphibians!

Herp Vocabulary

Adaptation - a physical or behavioral characteristic that helps an animal to survive

Aquatic - water-based

Bask - a behavior in which cold-blooded animals lay in the sun to increase body temperature

Brumate/Brumation - a period of inactivity that animals enter during the winter which requires less energy

Carapace - the top of a turtle's shell

Class - the scientific grouping of animals within each Phyla based on shared characteristics

Cloaca/Vent - The opening that provides exit for waste and entrance to the reproductive tract in reptiles, amphibians, birds and fish

Ectothermic - cold-blooded, body temperature is dependent on ambient temperature

Estivate - A period of inactivity that animals enter during hot or dry weather to conserve moisture

Fragmentation - when a habitat is separated into small pieces by roads or other human development

Herp - a reptile or amphibian

Herpetologist - a scientist that studies reptiles and amphibians

Hibernacula/Hibernaculum (pl.) - A winter resting place for animals

Indicator species - animals that provide information on the health of an ecosystem

Larva - the first, immature stage of development

Metamorphosis - a process of physical transformation from one form to another

Permeable - a surface which allows liquids or gases to pass through

Plastron - the bottom of a turtle's shell

Subsidized predators - predators whose population increases with unnatural, human-supplied resources

Terrestrial - land-based

Vernal pool - a temporary wetland filled seasonally by snowmelt and rain water

Eastern red-backed salamander, Chisopher Raithel

Quick Links

RIDEM HerpObserver App

This app, developed by the Rhode Island Division of Fish and Wildlife, allows you to submit your own observations of any reptile or amphibian in the state. The data is submitted to our secure database, and is only viewed by our state herpetologist. This is a great way to help contribute to conservation and monitoring work right in your own backyard!
dem.ri.gov/herpobserver

Northeast Partners in Amphibian and Reptile Conservation

This is a regional working group that provides information on local research projects to protect and conserve reptiles and amphibians.
http://northeastparc.org/

Society for the Study of Amphibians and Reptiles

This is a non-profit that provides information on herp habitats, how to become a herpetologists and conservation projects around the world. Contact the “Herpetology Hotline” for the answers to your reptile and amphibian questions!
https://ssarherps.org/

The Association for Zoos and Aquariums (AZA)

The AZA has compiled activities, articles and information on amphibians around the globe.
https://www.aza.org/amphibian-education-resources

A Primer on Reptiles and Amphibians

This can be found as a PDF here or ordered online. It is an excellent collection of materials that includes background information on herps, threats they face and their imporatnce in the ecyosystem.
https://www.learnaboutcritters.org/files/herp-primer.pdf

The Natural World

This website has a series of articles on the misconceptions of snakes as well as other great nature based articles and educational content.
https://medium.com/natural-world/tagged/snakes

AmphibiaNet

This website allows you to search their database for amphibians around the world and provides in-depth information on their distribution and life-history along with the threats they face.
https://amphibiaweb.org/

Musk turtle, Gabrielle DeMeillon

Lesson 1: Rhody Reptiles

Theme
Reptiles are uniquely adapted to survive, and we must understand their behaviors in order to help conserve them.

Learning Objectives
In this lesson, students will learn about reptile characteristics and behaviors, and what the RIDEM Division of Fish & Wildlife is doing to protect reptiles in Rhode Island.

Corresponding Activities for this Lesson
- Reptile Rumors
- Box Turtle Blitz

Materials
- Lesson 1 PowerPoint
- Turtle shell
- Snake shed
- Rhode Island turtle and snake cards
- Reptile true/false cards (information found in Reptile Rumors activity)

Lesson
1. Start by asking students what they know about reptiles. Discuss characteristics of reptiles through a Venn-diagram with turtles and snakes. Students can come up with characteristics to categorize, or use the list provided on the PowerPoint presentation.
- Pass out Rhode Island turtle and snake cards to each table to generate discussion.
- Discuss differences and similarities between the two.
- Discuss how adaptations help reptiles to survive.

2. Review "Box Turtle Adaptations" slide asking how each characteristic helps box turtles to survive, pass around the box turtle shell. *Detailed notes can be found in the Lesson 1 PowerPoint.*

3. Explain that reptiles have strange behavioral adaptations that often cause them to be misunderstood. Ask students why reptiles behave differently than other animals.

- In groups, have students discuss what they know about reptile behavior.
- Pass out "Reptile Rumor" cards or have students write ideas on a whiteboard.
- Review correct answers, marking each one off as either "TRUE" or "FALSE."

4. Ask if anyone has seen a reptile.

- Collect answers and ask if anyone knows where they go in the winter.
- Review behavioral adaptations of reptiles. *Detailed notes about reptile adaptations and seasonal behaviors are provided in the Lesson 1 PowerPoint.*

5. Ask students what they think they should do if they see a snake.

- Explain to students that snakes really just want to be left alone, and that seeing one isn't cause for panic.

6. Explain to students that the RIDEM Division of Fish & Wildlife is working to protect and conserve our native reptiles.

- Ask students if they think there might be any reptiles that are threatened and need help in Rhode Island.
- Review the RIDEM project to protect State-Endangered Northern diamondback terrapins, and how the work of citizen scientists has been instrumental in the conservation of this species over the past thirty years. *Detailed notes about the history of terrapins in Rhode Island are included in the Lesson 1 PowerPoint.*
- Discuss how the new "turtle drone" is helping biologists at the RIDEM Division of Fish & Wildlife find new populations. Show turtle drone video.
- The DFW is also monitoring diamondback terrapins, spotted turtles and box turtles through "mark and recapture" techniques, and through volunteer surveys.

Northern water snake, Christopher Raithel

Reptile Rumors

Students will learn about reptile adaptations and behavior through small group discussion and critical thinking. Each group will be given cards, which they must discuss to determine if it is true or false and why. Afterwards, the class will come together to review the correct answers.

How to:

- Break students into groups.
- Designate a location for answers that are true and one for answers that are false.
- Pass out reptile true/false cards around the room.
- Have students discuss each card within their groups for a couple of minutes.
- Have groups decide (or designate) card readers to stand on the side where they believe their card belongs.
- Ask what led each group to decide on true or false, review the correct answers. Correct answers and discussion points are listed below.

1. Reptiles are cold-blooded: TRUE

Reptiles are ectothermic. Their body temperature is the same as the air temperature, so they have to move in and out of the sun to keep their bodies functioning properly. While their blood isn't actually "cold" the idea is on the right track!

2. Snakes are aggressive and will chase you: FALSE

Most snakes are very timid and will try to get away quickly if they see a human. Imagine you were laying on the ground, no arms, no legs, and a giant started screaming and jumping around in front of you. That's what it's like for snakes! They just want to get away. Sometimes, humans may not realize they are between a snake and its safe spot. For example: if you find yourself between a water snake and the shore, he may appear to swim toward you when really, he is just trying to make it to the safety of land.

3. Snapping turtles will bite your toes: FALSE

Snapping turtles do have very strong jaws and long necks, but they aren't interested in your piggy toes! They will avoid humans in the water, we are loud and splash around a lot, that's not something they are interested in. They like to eat fish, frogs and other small animals.

4. Turtles have no feeling in their shell: FALSE

Turtle's spines are fused to their top shell, or carapace, and have nerve endings, so they are able to feel. In the past, people would carve initials into their shells, but this can be very painful for the turtle. While a turtle might not be able to communicate it is in pain like a human, it can still feel it.

5. There are no venomous snakes in Rhode Island: TRUE

There were once timber rattlesnakes in Rhode Island, but they were killed by humans and have not been seen in the state since the 1960's. Copperheads can be found in Connecticut and Massachusetts, but there are no records of them in Rhode Island. Many people have heard the myth that we have cottonmouths (aka water moccasins) in our state, however, this species doesn't occur north of Virginia and couldn't survive in our colder climate.

6. The only good snake is a dead snake: FALSE

This mentality is what caused timber rattlesnakes to disappear from Rhode Island, which left us missing an important part of the ecosystem. Everything in the environment has a special role which is needed to keep the ecosystem in balance. Snakes help control rodent populations, which reduces the risk for disease, including tick-borne illnesses, like Lyme disease. The only good snake is one that is alive and doing its job in the ecosystem!

7. You can identify a venomous snake by its vertical (cat-like) pupils: FALSE

This is not a good way to tell apart snakes. First of all, I'm not getting close enough to a snake I can't identify to look into its eyes. Secondly, this isn't accurate, some venomous snakes have round pupils. Finally, all pupils can appear to be round when dilated (in the dark), even in venomous snakes.

8. Many species of non-venomous snakes will imitate venomous snakes: TRUE

Northern watersnakes are often misidentified as cottonmouths because they will flatten their head to make it look triangular, like a venomous snake. Hognose snakes will flare their neck so that they look more like a cobra and black racers will rattle their tails in the leaves to sound like a rattlesnake. Basically, they're all a bunch of posers! The only way to know if it is really a venomous snake is to learn how to identify each species.

9. It is against the law to take a turtle home from the wild to keep as a pet: TRUE

Many species of turtles, such as the northern diamondback terrapin and spotted turtle, have declined due to poaching for the pet trade. It is illegal to take ANY animal from the wild to keep as a pet, they belong in the wild, not in a home. Turtles are difficult to care for, and without the proper diet and habitat, they can suffer greatly.

10. It is okay to help a turtle cross the road: TRUE

If you have an adult with you and it is safe, we encourage people to help turtles cross the road. Fragmentation is one of the greatest threats to turtles, forcing them to cross roads to reach isolated resources. By helping a turtle cross the road, you could be saving an entire population!

11. Snakes don't have bones: FALSE

Snakes, like all reptiles, are vertebrates, which means they have a backbone. In fact, they have a very, very long backbone! Snakes are very flexible due to their many ribs and muscular bodies.

12. It is not okay to release pet reptiles into the wild: TRUE

Releasing a pet that you no longer want into the wild can not only be fatal to your pet but could also harm our native wildlife. Letting a pet go could introduce an invasive species to Rhode Island that could take over the resources that our native wildlife needs. It could also introduce new diseases that could affect our native species. NEVER release pets into the wild, find them a new, safe and happy home!

REPTILES ARE COLD BLOODED

Eastern Painted Turtle, G. De Meillon

SNAKES ARE AGGRESSIVE AND WILL CHASE YOU

Black Racer, C. Raithel

SNAPPING TURTLES WILL BITE YOUR TOES

Common Snapping Turtle, G. De Meillon

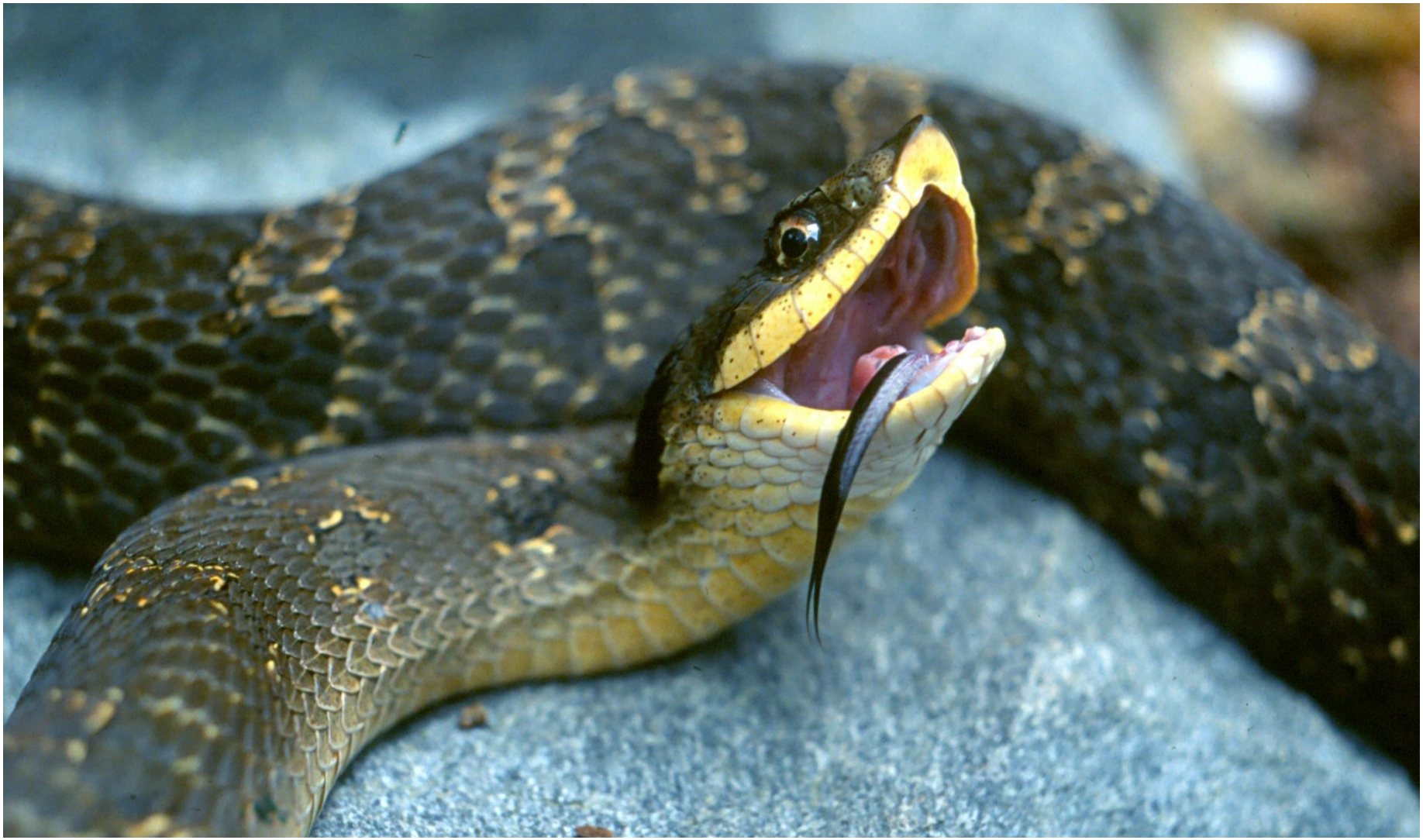
TURTLES HAVE NO FEELING IN THEIR SHELLS

Eastern Box Turtle, G. De Meillon

THERE ARE NO VENOMOUS SNAKES IN RHODE ISLAND

Northern Watersnake, G. De Meillon

THE ONLY GOOD SNAKE IS A DEAD SNAKE



Eastern Hognose, C. Raithel

YOU CAN IDENTIFY A VENOMOUS SNAKE BY ITS VERTICAL (CAT-LIKE) PUPILS

Eastern Milksnake, C. Raithel

MANY SPECIES OF NON-VENOMOUS SNAKES WILL IMITATE VENOMOUS ONES

Eastern Hognose, S. Buchanan

IT IS AGAINST THE LAW TO TAKE A TURTLE HOME FROM THE WILD TO KEEP AS A PET

Musk Turtle, G. De Meillon

IT IS OKAY TO HELP A TURTLE CROSS THE ROAD

Spotted Turtle, G. De Meillon

SNAKES DO NOT HAVE BONES

Smooth Greensnake, C. Raithel

IT IS NOT OKAY TO RELEASE PET REPTILES INTO THE WILD

Yellow-bellied Slider, G. De Meillon (non-native)


Box turtle, Peter Paton

Box Turtle Blitz

In this activity, students will act as herpetologists, searching for box turtles, a Species of Greatest Conservation Need in Rhode Island, and will record information on data sheets. Students will learn how scientists estimate populations and why it is important to monitor wildlife. This activity can be done in an outdoor space or classroom setting.

Materials:

- Laminated turtles
- Turtle data sheets
- Tape measure or ruler
- Pencil
- Small flags

How to:

1. Set up the survey area:
    - If playing outdoors, create 5 "survey transect lanes" using flags. Lanes should be approximately 10ft wide and 50ft long. They can be adjacent to one another.
    - If playing indoors, designate 5 "survey plots" within the classroom at least 10ft by 10ft each. They can be adjacent to one another.
2. Hide 1 turtle within each survey area. Feel free to hide them under/behind objects.
3. Introduce the activity and explain they will be performing a box turtle survey.
4. Break the class into five groups and assign each group a survey area.
    - If playing outdoors, explain that each group will survey only within their transect. They will stand side by side within their lane and hook arms. As a team, they will slowly walk toward the end of the lane, observing the ground for turtles as they go.
    - If playing indoors, explain that each group will search for turtles ONLY within their own survey plot. Encourage them to come up with a plan of how they will search the area thoroughly.
5. Once each group has completed their survey (and found a turtle), they should sit with their group.
6. Review the data sheet with students and have them record the habitat in which they found the turtle (field, woods, classroom…), the weather, and the time.
7. Have students measure the length and width of the turtles, determine the sex (males have red eyes, females have yellow or brown) and age them (count the number of growth rings on the plastron, like a tree) and mark down any other observations (damage, markings, etc.).

Discussion:

Was it difficult to find a turtle? Do you think it would be harder to find one if the survey area was the size of Rhode Island?

It may have been easy to find a turtle in this small area but surveying all of Rhode Island would be nearly impossible and would take a VERY long time. Instead of surveying the whole state this way, herpetologists pick places they are likely to find them, with good turtle habitat, and survey small sections across the state. This can at least determine which parts of the state do or do not have box turtles.

Do you think it is possible to count every turtle in Rhode Island?

Even if we could cover the whole state, box turtles can be tricky to find. They often bury themselves beneath grass or leaf litter. Even though herpetologists are very good at finding reptiles, there is always a chance that a few could be overlooked. It would also be very time consuming to count all of the box turtles in the state, and to find and count all of the new baby box turtles that hatch every year.

Are any of the turtles "notched?" Why do herpetologists mark turtles this way?

Herpetologists file these small notches into turtles' shells to tell them apart. Each turtle has a different code, the notches are located on different areas on the carapace. Scientists keep a record of all of the turtles they have notched so they can tell when they have caught the same turtle more than once.

What information can scientists obtain from these surveys?

By surveying different areas of the state, scientists can tell where box turtles like to live, this lets them know what habitats are important to protect. By marking each turtle, they can estimate the size of the turtle population in Rhode Island by comparing the number of "recaptured" turtles vs. the number of new turtles they capture each year. Taking data on age and size can tell us about how long box turtles live and how big they are. They can also look at the health of the population by comparing the number of adults to hatchlings and males to females.

Why is it important to monitor (keep track of) turtle populations?

Scientists perform these surveys each year to see how the turtle population changes over time. Are there more turtles than last year? Less? Are they moving to new locations? Looking at past years, scientists can determine what is "normal" and what is abnormal. If scientists didn't monitor wildlife populations, we wouldn't even know what "normal" was and might not notice if animals were slowly disappearing in our state. With all of the data that we gather, we can make sure populations are healthy, and take action if wildlife needs our assistance!

Outdoor Survey Transect Layout

RHODY CRITTER KITS

DEM RHODE ISLAND

Box Turtle Data Sheet

Name:	Date:	Time:
Temperature:	Weather:	Habitat:

Carapace Length (mm)	Carapace Width (mm)	Plastron Length (mm)	Plastron Width (mm)	Age*

*To figure out how old your turtle is, count the number of lines (annuli) in one section of its plastron.

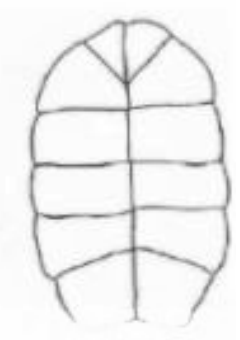
Circle your turtle's characteristics:

Male (red eyes)	Female (yellow or brown eyes)	New (no marks)	Recapture (shell has notches)

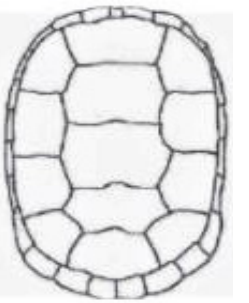
Comments:

Draw any other markings, damage, or observations below:

PLASTRON



CARAPACE



Eastern red-spotted newt, Christopher Raithel

Lesson 2: Ask Me About Amphibians

Theme

Amphibians are indicator species and as such they reveal the health of the ecosystem and reflect the impacts of climate change.

Learning Objectives

In this lesson, students will learn about amphibian adaptations, the effects of climate change on amphibians, and the work the RIDEM Division of Fish and Wildlife is doing to conserve our state's amphibians.

Corresponding Activities for this Lesson

- Fragmentation Frenzy

Materials

- Lesson 2 PowerPoint
- Frog life cycle (metamorphosis) models
- Large paper
- Markers/crayons

Lesson

1. Ask students if anyone has ever found a frog, toad or salamander. Give students the opportunity to share their experiences with amphibians. Prompt discussion with the following questions and fill in with the following points:

- ***Where did you find them?*** Frogs, toads and salamanders spend part of their lives on land and part in the water. This is one of the characteristics that separates amphibians from other kinds of animals.
- ***What did they feel like?*** Amphibians have permeable skin. They absorb water, oxygen and nutrients this way. Since frogs and salamanders need to stay moist, they have a mucus coating on their skin to stop them from drying out, this is what makes them feel slimy. Toads lack this covering and can tolerate drier conditions, they feel rough and bumpy.
- ***How big were they?*** Amphibians go through metamorphosis, they change from egg, to larva (tadpole) to adult. Juveniles of most amphibians look like miniature versions of adults. *Show metamorphosis models.*
- ***Was it cold? Warm?*** Amphibians are ectothermic, or cold-blooded. Discuss "Amphibians through the Seasons," found in the Lesson 2 PowerPoint.

2. Ask students what comes to mind when they hear the words "climate change."

- Collect answers and write down the words students have heard associated with climate change.
- Explain to students the difference between weather vs. climate. For example, think of it as a closet, weather is your outfit for the day, climate is your whole wardrobe for the year.
- Explain that the climate, or weather pattern over the past 30+ years, has been changing at much faster rate than normal. This is causing ice caps to melt, sea level to rise and weather to become more extreme (hotter hot days and stormier storms).

3. Ask students how these things might impact wildlife.

- Discuss impact to amphibians: Amphibians are what scientists call "indicator species." They are sensitive to changes in the environment due to their unique adaptations (ectothermic, absorb toxins through skin, need water during their life-cycle). By observing how amphibian populations are doing, scientists can determine the health of the habitat. Less frogs or sick frogs means poor/unhealthy habitat; more frogs and healthy frogs means good/clean habitat.

4. Ask students how the RIDEM Division of Fish and Wildlife could help our native amphibians. Have students suggest ideas, then discuss "Operation Spadefoot." *Details about this conservation project are provided in the notes section of the Lesson 2 PowerPoint.*

5. Ask students how *they* could help amphibians and slow down climate change. Have students work in groups to create a mural of small ways they can help. Students should use their own ideas for the murals, but here are some examples as well:

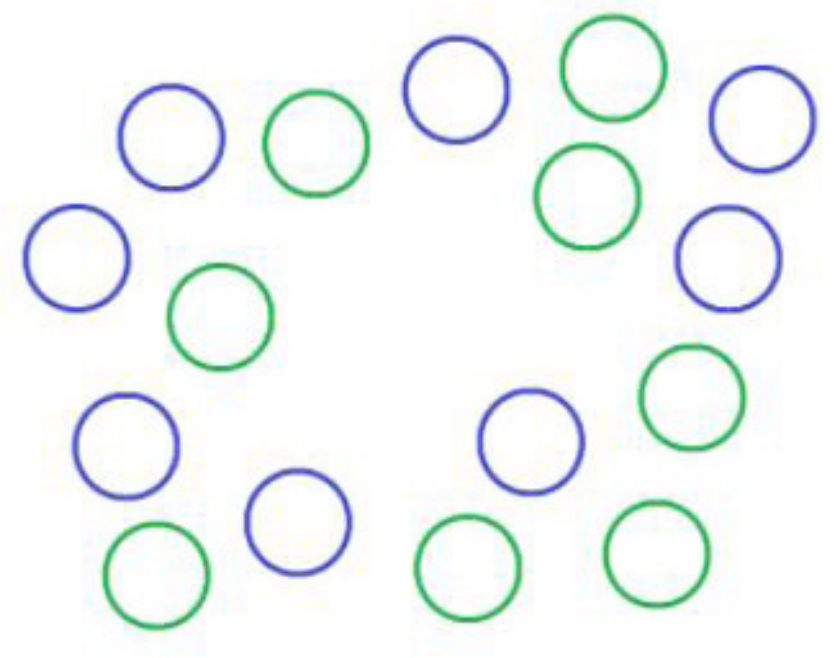
- Don't pollute
- Don't use pesticides
- Clean up and protect amphibian habitats
- Turn out the lights
- Ride a bike instead of driving
- Conserve water
- Reduce, reuse, recycle

6. Have each group share their mural and explain why it is important to them to protect amphibians and other wildlife. Have each student pick one thing that was discussed today that they would like to share with someone in the future (friends, family, neighbors).

NSpotted salamander, Christopher Raithel

Fragmentation Frenzy

How to:



1. Set up a "habitat" of hula hoops, floor spots, or construction paper, similar to the layout on the left. You can get creative with your habitat layout, depending on the playing area. The habitat should look connected. For example, a "corridor" of green hoops connects a "patch" of forest, which connects to a "wetland."

2. Before beginning, review the term "fragmentation." Explain to students that the green represents forested habitat, and the blue hula hoops are wetlands. Explain to students that they are frogs and salamanders, and have to find their way through the habitat. Encourage younger students to hop, crawl, and imitate frog calls as they play.

3. Explain to students that when the leader calls out "Freeze," they have to find a "safe" habitat patch (blue or green spaces), and freeze there. The amphibians caught outside of the safe habitat are out of the game.

4. As each round progresses, replace some blue or green hoops with orange and red. Explain to students that these are houses, roads, stores, or other human structures that have replaced the habitat. The amphibians can pass through these human habitats, but cannot stay there when the leader says to freeze. These are not ideal habitat patches for our amphibians; they do not have all of the things that these animals need to survive. If they are caught in the red or orange, they are out of the game.

5. At the end of the game (when one amphibian wins), ask students to explain what happened throughout the game. What was it like to be an amphibian in a fragmented environment?

RHODY CRITTER KITS

DEM RHODE ISLAND

Northern ring-necked snake, Christopher Raithel

Lesson 3: Helping Herps

Theme

Herps are important for both their intrinsic and instrumental values but they face many threats due to human impacts, therefore we must help protect them.

Learning Objectives

In this lesson, students will learn about threats to herps and the actions we all can take to help our reptiles and amphibians in Rhode Island.

Corresponding Activities for this Lesson

- Slink and Think Gallery Walk

Materials

- Lesson 3 PowerPoint
- Large pieces of paper
- Markers

Lesson

1. Create a gallery walk using the "Slink and Think" activity. Discuss value of reptiles and amphibians to humans and the environment.

2. Define intrinsic and instrumental values, as well as the differences and similiarities between the two.

- Intrinsic value is the importance that something has, simply because it exists (ex. It is beautiful, different, cool, etc.)
- Instrumental value is the importance it has because of its usefulness (ex. It is a food source, it is a building material, it controls pests, etc.)

3. Ask students if they can think of some threats that herps face.

- *Habitat degradation:* Pristine habitats are being polluted by toxins and pesticides.
- *Habitat Fragmentation:* Herp habitat is being split into tiny pieces by roads and other human development. For example, if someone built a road between your bed and your refrigerator, what would you do? How would you eat? Would you risk crossing the road? This is the dilemma that reptiles and amphibians face.
- *Disease:* Herp populations are disappearing due to ranavirus, chytrid fungus and other diseases. Details about each disease are provided in the notes section of the Lesson 3 PowerPoint.

4. Explain to students that the RIDEM Division of Fish and Wildlife is helping by conserving big chunks of habitat in our Wildlife Management Areas where no one is allowed to develop the land for buildings or roads.

- Wildlife Management Areas provide a safe place so that animals, like herps, don't have to worry about pollution or crossing roads.
- The Division of Fish and Wildlife also is looking outside of the protected habitats to see where animals need to cross roads most frequently. By identifying these dangerous locations, they can make tunnels under the road to make it safer for herps to get from one piece of habitat to another.

5. Explain to students that habitats can also be created or restored, like during "Operation Spadefoot!" *Details about this collaborative project are provided in the notes section of the Lesson 3 PowerPoint.*

6. Ask students what they think everyone can do to help protect herp habitat.

- Don't litter
- Clean up wetlands
- Help and encourage wetland protection
- Plant native species
- Don't use pesticides
- Share your knowledge!

Eastern milk snake, Christopher Raithel

Slink and Think Gallery Walk

In this activity, students will consider the importance of reptiles and amphibians to them individually, to humans as a whole and to the ecosystem through a "gallery walk."

Materials:

- Giant Post-its
- Colored markers

Introduction:

Explain to students that there are 5 pieces of paper around the room with questions for them to answer. Give students about 10-15 minutes to walk around the room independently and write their thoughts on each piece of paper. This can alternatively be done in small groups with a leader writing a single answer for their group. Encourage students to come up with their own ideas, and that answers can be anonymous. Once the time is up, gather back together as a group and discuss all of the answers. Encourage younger students to hop or crawl between stations like an amphibian or a reptile!

Set up the Gallery Walk:

1. On each piece of paper, write the following questions (feel free to come up with your own, as well):
   - What do you think is "cool" about herps?
   - How do you think herps can help humans?
   - Why do you think herps are important to the ecosystem?
   - Why should humans protect herps?
   - How can you help herps?

2. Introduce the activity and explain the concept of the Gallery Walk.

3. Pass out markers and disperse students or groups around the room. Give students about 2 minutes per question, making sure to give them a warning before time is up. It is okay if they don't get to all of the questions, they will have a chance to participate in the final discussion.

4. When the time is up, collect the markers and give students a couple of minutes to walk back through and read the answers from other classmates, ask them to think about what stands out to them.

5. Gather students back together and begin discussion.

Discussion:

Review all questions and answers. For each one ask the following:

Did anything stand out to you from these answers? Did you strongly agree/disagree with any of these answers?

This is a great time to let students express themselves. Encourage students to share their thoughts, and have a respectful discussion.

What do you think is "cool" about herps?

When discussing this question, introduce the term "intrinsic value." Examples: They have armor, they can live on land and in water, they can climb trees without arms...

How do you think herps can help humans?

When discussing this question, introduce the term "instrumental value." Examples: Snakes act as pest control, amphibians are indicator species, toads eat bugs...

Why do you think herps are important to the ecosystem?

Explain that when herps benefit the ecosystem, it is beneficial to humans as well. Examples: Act as prey items for other animals, help keep a balance...

Why should humans protect herps?

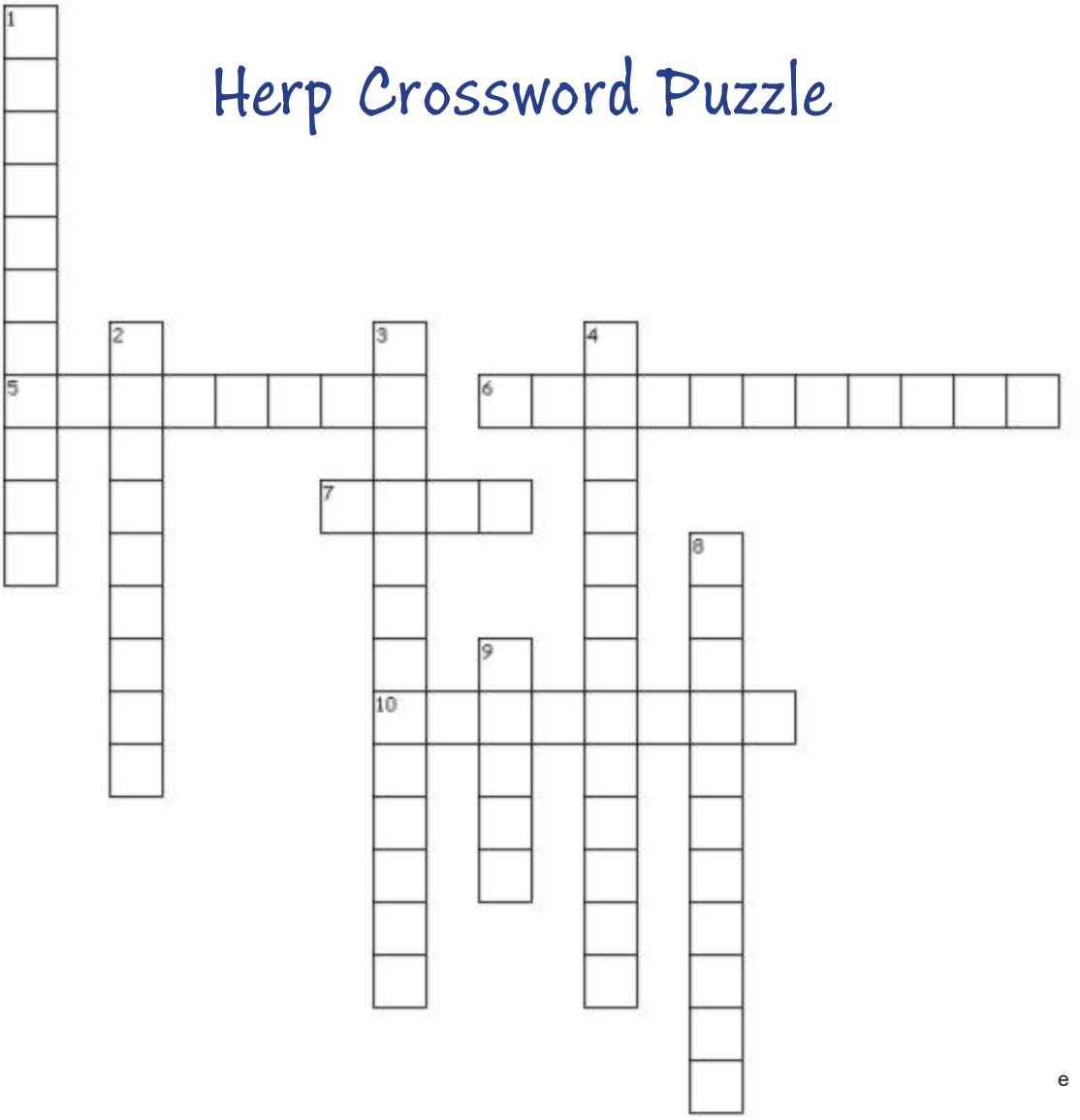
People value wildlife for many different reasons but no matter the motive, it is important to protect them. Humans have caused a lot of damage to populations of herps and their habitats so it falls on us to help them. Examples: They are important to the ecosystem, then provide benefits to humans, because we caused them harm, because they are awesome...

How can I help herps?

There are many easy ways that you can help herps! One of the best ways that you can help herps is simply by sharing your knowledge. Many people don't realize that snakes help control rodent and tick populations or that frogs are indicator species and can tell us the health of the environment. Letting your neighbors, friends and family know all of the instrumental value that herps have might make them also see their intrinsic value! Herps are awesome! Examples: Protect their habitat, don't litter, help a turtle cross the road...

Additional Resources & Activities

Herp Crossword Puzzle



e

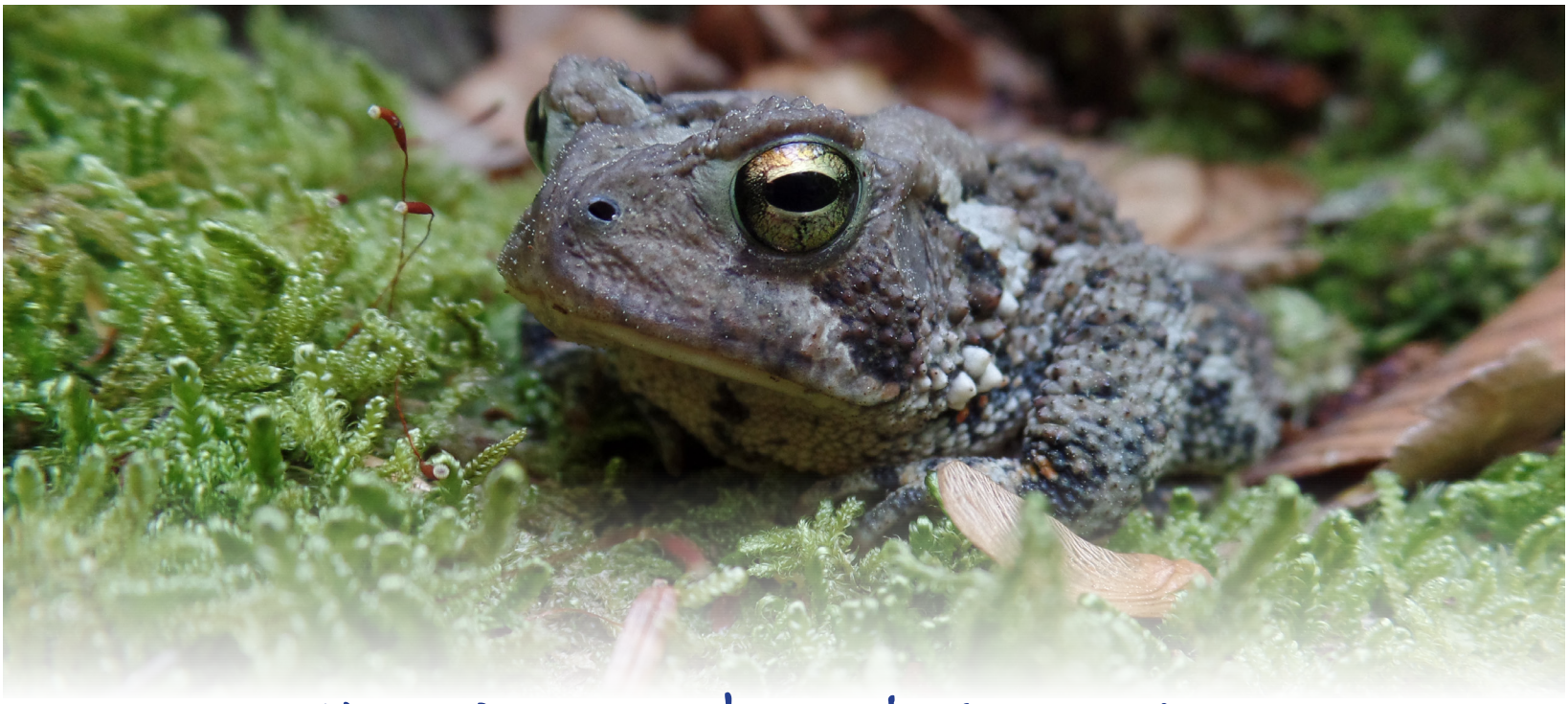
Test your knowledge of reptiles and amphibians!

Across

5. the top of a turtle's shell
6. lives on land
7. what reptiles do to soak up the sun's warmth
10. the bottom of a turtle's shell

Down

1. where a reptile spends the winter
2. reptile hibernation
3. the change certain animals go through to turn into their adult form
4. when a habitat is split up into lots of smaller pieces
8. what you call an animal that is cold-blooded
9. what you call a baby amphibian



Herp Crossword Puzzle Answer Key

Across

5. Carapace
6. Terrestrial
7. Bask
10. Plastron

Down

1. Hibernacula
2. Brumation
3. Metamorphosis
4. Fragmentation
8. Ectothermic
9. Larva

Herp Word Search

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

Can you find all of these words?

Ectothermic
Brumate
Hibernacula
Bask
Estivate
Metamorphosis
Larva
Terrestrial
Reptile
Plastron
Fragmentation
Wetland
Amphibian
Carapace