

The Secret Pool



KIM RIDLEY is an editor and science writer, focusing on health, environment, culture, and social change. Her words evoke and display her passion for the natural world and her deep commitment to following her own curiosity. Through the scientific process, journal articles, and now with her first picture book, she shares her passion for the natural world with young readers and budding scientists.

REBEKAH RAYE is an artist and illustrator who has an appeal to animal and nature enthusiasts of all ages. Her new book with Kim displays her seamless adaptation to informational text. The illustrations present the natural magic and scientific significance of vernal pools, while sharing the light that shines within the creatures. From fairy shrimp to bullfrogs readers and listeners will come to know the variety and abundance of critters who rely on these secret pools for their survival.

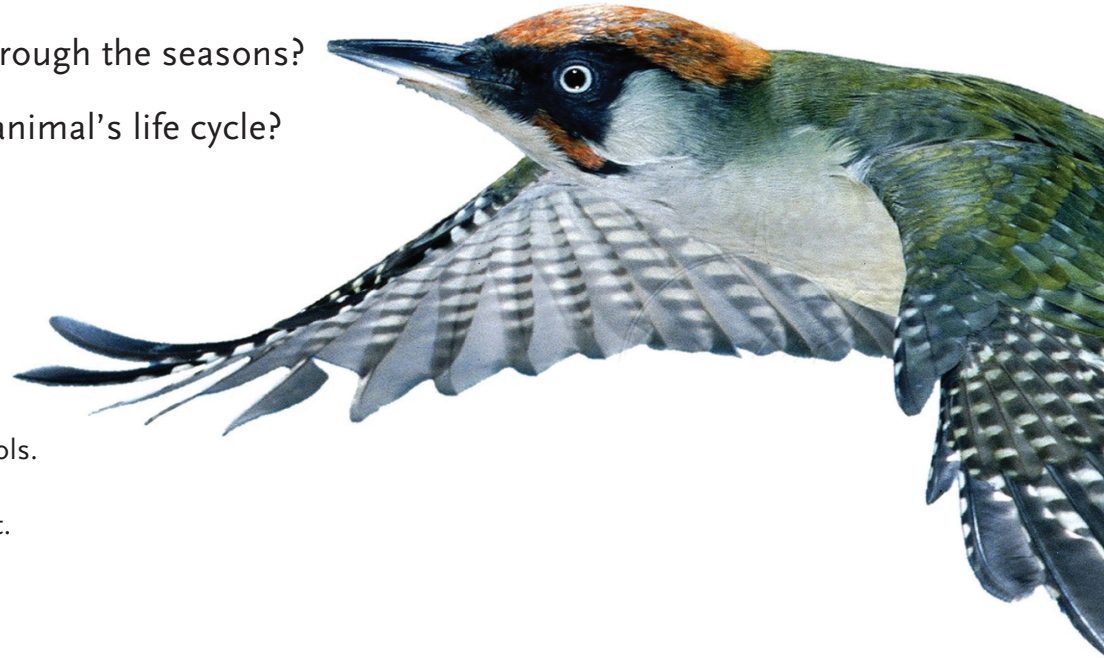
DISCUSSION QUESTIONS

1. How are vernal pools different than ponds and other bodies of water?
2. What makes the protection of vernal pools important?
3. What type of animals and critters rely on vernal pools?
4. What are some of the ways a vernal pool changes through the seasons?
5. How do vernal pools support different stages of an animal's life cycle?

PROGRAM OBJECTIVES

PARTICIPANTS WILL BE ABLE TO:

1. Identify the characteristics of vernal pools.
2. Identify several animals or critters that live in or breed in vernal pools.
3. Identify reasons why vernal pools are important to the environment.
4. Ask questions and explore evidence about habitat survival.
5. Engage in investigation and generalization skills, by making inferences and drawing conclusions.
6. Gain practice in using observation and evidence from text to demonstrate learning about vernal pools.
7. Understand how the author and illustrator used evidence to support a specific viewpoint.



TEXT-TO-TEXT BOOK CONNECTIONS



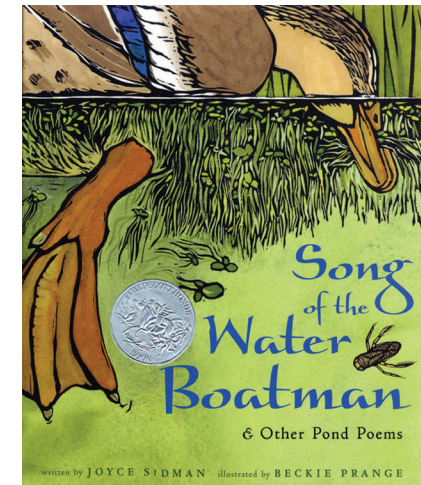
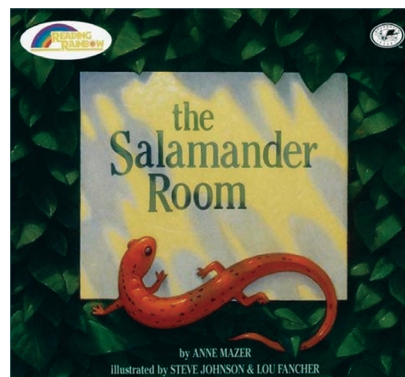
FROG HEAVEN
by Doug Wechsler



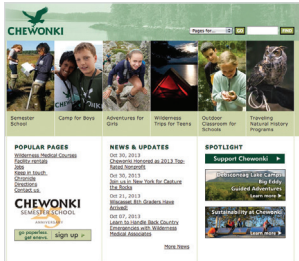
BIG NIGHT FOR SALAMANDERS
by Sarah M. Lamsteing
& Carol Benioff

SONG OF THE WATER BOATMAN
& OTHER POND POEMS
by Joyce Sidman
& Beckie Prange

THE SALAMANDER ROOM
by Anne Mazer



The Secret Pool



CHEWONKI

<http://www.chewonki.org>

For questions or to book a program call 207.882.7323
Vernal Pool traveling history program:
Stepping Stones in a Sea of Forest



TILBURY HOUSE PUBLISHERS

<http://www.tilburyhouse.com/childrens/the-secret-pool.htm>

Publisher's page on *The Secret Pool*.



MAINE VERNAL POOLS WEBSITE

<http://www.umaine.edu/vernalpools/>

Lots of information on Maine's vernal pools. Printable vernal pool ID cards under additional resources page.



HOME SCHOOL SHARE

http://www.homeschoolshare.com/index_animal_studies.php

Free animal "Lap books" for frogs, turtles, and salamander. Ideal scaffold for independent student research.

THE VERNAL POOL ASSOCIATION

http://www.vernalpool.org/vernal_1.htm

Promoting the study, appreciation and protection of vernal pools. There is also a great slide show called "Wicked Big Puddles" that would be great to share with students.



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r p m i r h s s p a c e f w w
o e k h u o p r d l r j f o j
t d d a a o e a t e u l o h w
q v g n t d p q l n s d a s q
v q k t a t v t c f t a m w b
j s e t a m r e j f a m g c g
u d o t l u a n r f c i m d k
s r i p t y q l n n e c r z f
s o v k p u x u a z a l z y m
n f r o g d m o i s n l k q m
p s r w d k a v o j q s y e i
w a t e r s h e d l r r d d i
t d a g f f r a g l e f v l z
o o c t i o o i t u k k a r a
z f s m g r n i w s h x d x r

WORD SEARCH

(fairy) shrimp

watershed

spotted

salamander

vernal

wood frog

predators

turtle

crustacean

adaptation



Draw a line from the word on the left to the definition on the right that best matches.

Fairy shrimp

Pertaining to spring

Wetlands

Living or growing in or near water

Spotted salamander

A small transparent crustacean

Vernal

A crab, lobster, or shrimp

Zooplankton

Places that are saturated with water, such as swamps and marshes

Aquatic

The action or process of changing

Invertebrate

An animal that doesn't have a backbone, such as an insect or worm

Crustacean

A North American salamander with yellow spots

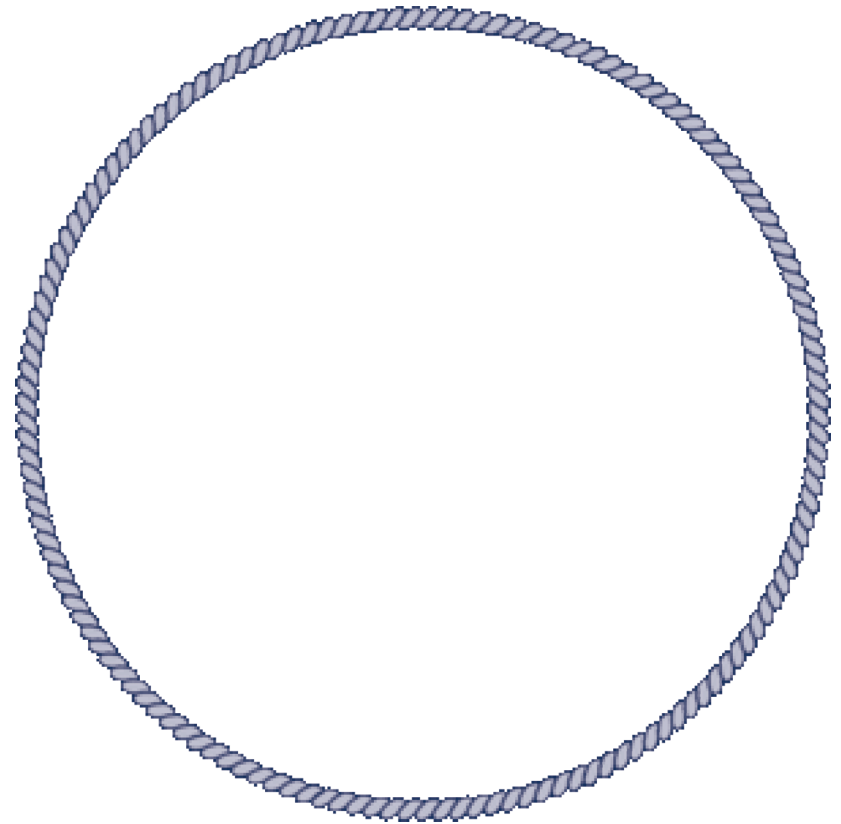
Adaptation

Microscopic animals that live in water

“Accuracy of observation is the equivalent of accuracy of thinking” – Wallace Stevens, American Poet

Like a scientist, you can use a variety of methods, tools, and techniques to understand your natural world. With just a rope and a field journal you can begin to observe and gather data through “Spot Observations.”

1. Choose a spot you can keep a close eye on.
2. Take a rope or string that is about 3-4 ft. long and tie the ends together to form a circle.
3. Lay the circle you have made on the spot you have chosen.
4. Visit the spot at different times of the day and over several days. Notice changes that are taking place (are insects living there, anything growing, any evidence of life, is the spot sunny or in the shade)
5. Record your observations, questions, and hypothesis in your field journal



1. Make an ABC Concept Book on Vernal Pools.
2. Make field guides to vernal pools.
3. Design persuasive vernal pool awareness posters or brochures (www.vernalpool.org has a sample lesson on this activity).
4. Service Learning Project: Caution Signs for Amphibians Crossings.
5. Vernal pool poetry (mentor text: *Insectlopedia* by Douglas Florian).
6. Point of View stories (writing vernal pool stories from the lens of different critters: fairy shrimp, wood frog).



Photo from vernalpool.org

WOOD FROG FACTS BY KIM RIDLEY

One of the best ways to find a vernal pool is to listen for male wood frogs in March and early April. They sound like quacking ducks.

Fun Fact: Wood frogs survive winter by crawling under the leaves and freezing. Their bodies make a special chemical that prevents them from freezing solid. Their hearts stop beating and they stop breathing. They wake up again when spring rains and warmer temperatures thaw out their bodies.

Another Fun Fact: Wood frogs usually breed and lay their eggs in the vernal pool where they were hatched. Sometimes, however, young wood frogs breed in a new vernal pool. Scientists have discovered that they will travel up to a half mile (2,260 feet) to reach a vernal pool.

Color and size: Adults are about two inches long. They have a black mask. Males are usually browner and females are usually more rust or orange in color.

Habitat: After laying their eggs in vernal pools, wood frogs spend the rest of the year on land in damp, mossy places in the forest.

Food/Prey: Spiders, beetles, earthworms and other invertebrates (small animals without a backbone). Wood frogs are carnivorous (eat other animals).

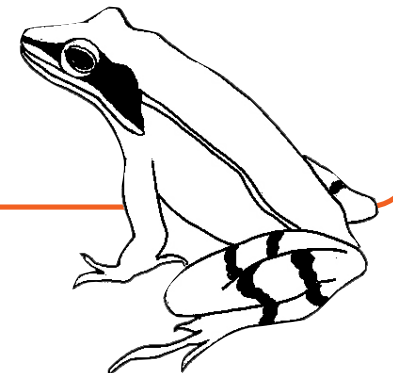
Predators: Raccoons, herons, owls, snakes, snapping turtles, foxes, coyotes.

Challenges: Crossing busy roads to reach vernal pools. Destruction and pollution of vernal pools. Tadpoles must grow legs and lungs before pools dry up.

Eggs: Up to 1,000 eggs per egg mass, which looks like bubbles on the surface of a vernal pool. Masses are round and between the size of a golf ball and a soft ball.

Tadpoles: Eat algae (herbivorous). Eaten by bullfrogs and other predators.

Lifespan: Up to 3 years.



SPOTTED SALAMANDER FACTS BY KIM RIDLEY

On the first rainy nights of spring when the temperature is near 50 degrees, spotted salamanders emerge from their underground homes and migrate to vernal pools to breed and lay their eggs. The best way to see spotted salamanders is to bring a flashlight and visit a vernal pool on a rainy night in early spring. The salamanders will stay in their pools for up to two weeks.

Fun Fact: Spotted salamanders live underground in the tunnels of rodents such as water shrews. They usually breed in the same pools where they were hatched.

Another Fun Fact: Each spotted salamander has between 23 and 45 spots.

Color and size: Adults are black with yellow spots and 6 to 9 inches long.

Habitat: Rodent tunnels in forests. Sometimes found under tree roots and logs.

Food/Prey: Earthworms, spiders, slugs, snails, ants, millipedes, beetles and grubs. Spotted salamanders are carnivorous (eat other animals).

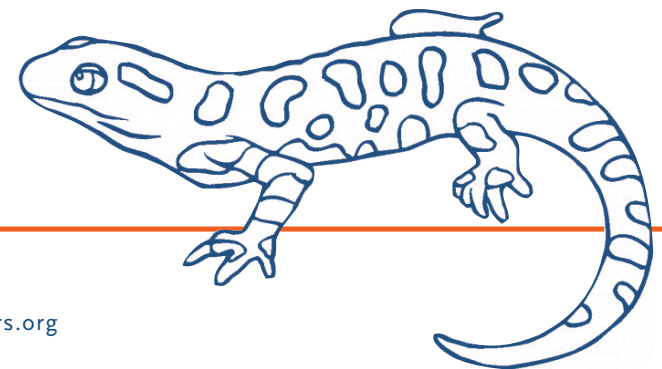
Predators: Raccoons, chipmunks, skunks, snakes, turtles.

Challenges: Many spotted salamanders are run over by cars while trying to cross busy roads to reach their vernal pools. Pools being destroyed or polluted. Larvae must grow legs and lungs before vernal pools dry up..

Eggs: Up to 250 eggs per egg mass. Egg masses are shaped like kidney beans, have a clear jelly coating, and are attached to twigs floating in a vernal pool.

Larvae: Eat each other, fairy shrimp, and mosquito larvae. Carnivorous.

Lifespan: Up to 20 years.



FAIRY SHRIMP FACTS BY KIM RIDLEY

Fairy shrimp live in fresh water, but they are related to lobsters, shrimp, crabs, and other crustaceans that live in salt water. Crustaceans, which live in water, are also related to insects and spiders.

Fun Fact: Fairy shrimp can only live in vernal pools. They spend the winter as eggs. Winter eggs must dry out and freeze before they can hatch in the spring. Some fairy shrimp eggs can last 15 years before hatching. These eggs are sometimes spread to other vernal pools on the bodies of larger animals.

Another Fun Fact: Fairy shrimp swim upside down. They have 11 pairs of feathery feet.

Color and size: Adults are red-orange and about the size of a paperclip.

Habitat: Vernal pools.

Food/Prey: Algae, bacteria, and microscopic animals in vernal pools.

Predators: Wild ducks, beetles, spotted salamander larvae.

Challenges: Crossing busy roads to reach vernal pools. Destruction and pollution of vernal pools. Tadpoles must grow legs and lungs before pools dry up.

Eggs: Fairy shrimp lay their tiny eggs in the bottom of vernal pools. Each egg is about the size of the period at the end of this sentence.

Lifespan: A few weeks.

