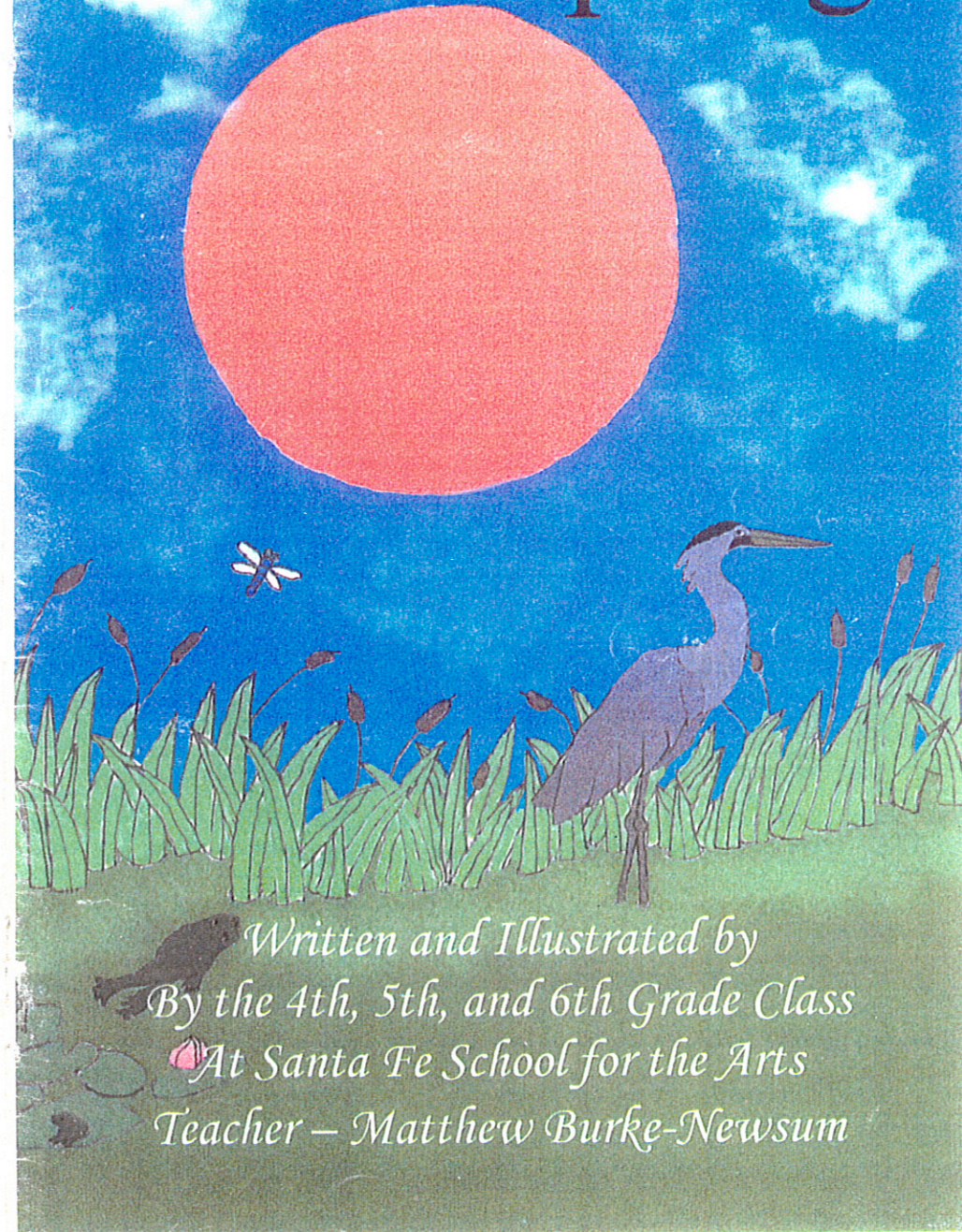


sunrise springs



*Written and Illustrated by
By the 4th, 5th, and 6th Grade Class
At Santa Fe School for the Arts
Teacher – Matthew Burke-Newsum*

The 4-6th Grade Badger Class at the Santa Fe School for the Arts created this Field Guide. We began our work in September of 2004 and completed the project in November. The students studied different types of Field Guides and came up with this format on their own. Each page was prepared by an individual student in the class. During this process, they learned research skills, writing techniques, editing techniques, and of course, biology. They spent many days at Sunrise Springs studying the pond life. They also interviewed employees and learned about the business side of Sunrise Springs.

The Badger Class would like to thank Sunrise Springs for allowing us the opportunity to use their beautiful facilities as a place for learning. Everyone was extremely nice and helpful to our class and we would love to visit again in the future.

Thank you kindly,

Matthew
Teacher, Badger Class

Damselfly

Zygoptera

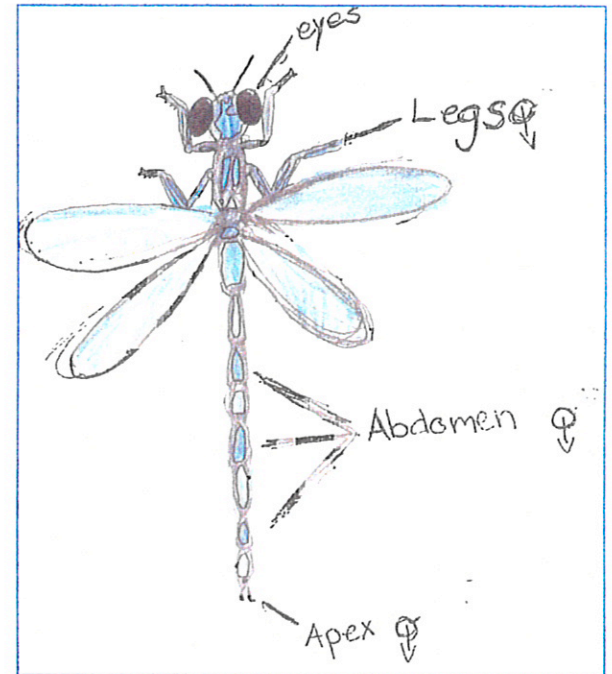
Physical Description: Wingspan: 38mm. Average body length: 32mm. Damselflies are smaller than Dragonflies, damselflies have more delicate wings and they fold them when they are at rest. Their wings are small at the base. Damselflies are weak flyers and they have magnifying eyes that meet at both sides of the head. They have small abdomens. They can come in many different colors like: black, blue, red, and many more.

Habitat: Damselflies live in wet habitats such as: ponds, swamps, streams, and lakes.

Food: When they are nymphs they eat: small minnows, aquatic larva, and tadpoles. When they are adults they eat other insects.

Predators: Frogs, toads, and some kinds of birds.

Interesting Facts: There are more than 4,700 kinds of Damselflies in the world. Damselflies begin their lives under water as nymphs. Damselfly nymphs have long thin bodies with three feathery looking tail-like gills that allow them to breath under water. Some damselflies only live as nymphs for a few months and they change many times in their underwater lives until they are ready for the final mutation. They then climb onto a rock, plant or anything they can find that is above water. Then the first skin splits in half and the beautiful damselfly emerges. After their bodies have hardened they can fly away to find a mate.



Camila

Pond Snail

lymnaeidae

Physical Description: The pond snail has a thin shell with a glossy reddish and brownish color. It can grow to be one inch to two inches wide. Their bodies are a gray color with a few yellow or white dots. They are one and a half inches high.

Underneath the shell they have a slimy body to move around. They also have 3 antennas to see and smell. They have a swirly shell in the shape of a spiral.

Habitat: The pond snails are usually found in North America. They are found in ponds, swamps, and other places like that. They are usually found where there is mud and algae.

Food: The pond snails mostly eat plants and algae. They also eat mud and microscopic animals that live on the top of the water. They eat all stuff by using v-like shape teeth.

Predators: If the pond snail gets touched by a predator it will fall to the bottom of the pond, and stay there for one hour and then it will come up for air. The pond snails' predators: birds, fish, frogs and leeches.



Interesting Facts:

1. The pond snail can move 2.4 inches a minute.
2. The pond snail breathes by coming up to the surface.
3. The pond snail is both girl and boy.
4. For the eggs to be fertilized they have to change sperms.
5. The pond snails usually lay 80 eggs.
6. The pond snails mate by w rapping around each other and then cover themselves with slime.
7. Both snails lay eggs after they mate.

Elle

The Female Mallard

Anas Platyrhynchos

Physical Description: The mallard is a very common duck. They're 50-70 cm. long and have 75-100 cm. long wing span. The female has an orange bill with black spots that they use as a source of camouflage while they're guarding their eggs in their nest. Both genders have orange webbed feet designed for swimming. Ducks waddle because of their webbed feet. Both genders also have a purple group of purple feathers surrounded by two rings of color, one black ring and one white one. The female has an overall brown color with a mix of white and gray. Their bills are long and designed for catching food. You'll see them a lot if you live near, or in North America.

Habitat: Mallard ducks are mostly found near water or in marshes. In the winter, they travel to warmer areas to raise their young. When they travel, they travel to Europe, China, anywhere except Antarctica.

The female builds her nest in a small hole. The nest is padded with dead wood, grasses, reeds and cattails. This combination of plants serves as a soft padding for the eggs.

Food: Mallard ducks eat seeds, grains, and different kinds of small insects. Mallards have jagged edges on their bills called "lamellae". The lamellae are used for catching food so it doesn't slip away.

Predators: One of the mallard's main predators is the raccoon, but the raccoon can only eat mallards when they're young. Snakes are also their predators but snakes only eat their eggs. Snakes don't have big enough necks to swallow mallards when they're full-grown.

Humans are also their predators, like most ducks, mallards are commonly hunted.

Interesting Facts: Mallard ducks are also called flat bills. Mallards like all other ducks have waterproof feet and can't feel water even if its ice cold! Not only are mallards the most common duck in the North America they're also the most hunted. The mallard was first found by the Chinese.



Corey

Mallard Drake

Anas Platyrhynchos

Physical Description: The male and the female Mallard can get to be 50-70 centimeters long with a 70-100 centimeter wing spread. The male is always at least a tiny bit larger than the female. Throughout time humans have discovered that the Mallard is larger when it lives in the wild. The Mallard Drake has a green head, sticking out of the head there is a yellow bill. On the male mallards neck there is a white neck ring. It has silky gray under parts, followed by a grayish body. Both male and female have white tail feathers with central black feathers that curl up. Both male and female have orange webbed feet which help them swim in shallow waters. Both sexes have feathers all over their body. The male and females feathers are waterproof. That makes it easier for them to swim.

Habitat: The Mallard may be found in marshes, ponds, rivers and lakes; they can only live in shallow waters. If you looked all around the world for a Mallard duck you would find it in any part of the world, except for Antarctica. You wouldn't find them in Antarctica because it is too cold for them. They usually fly to other places when the water freezes to rest their young. They travel to their nesting grounds between March and April

Food: They eat seeds, grains, acorns and aquatic invertebrates and insects. They also feed on shot-gun pellets. Mallards dive to the bottom of swamps marshes and lakes and ponds for their food. When they dive for their food they stick their tail feathers straight up in the air and their head under water.

Predators: One of the predators of the Mallard duck is the raccoon. The raccoon can eat Mallard babies very fast. Most snakes eat the babies when they are very young, most of the time they eat the eggs. Humans also hunt the Mallard as an adult! They pluck their feathers and sometimes they eat them or skin them!



Interesting Facts: The male attracts the female with its beautiful plumage. After the first two weeks when the babies hatch from their eggs the male deserts the female to fly with the male flock. The Mallard ducks are one of the most hunted ducks in the United States. These ducks are hunted by animals and humans! The Chinese discovered the Mallard duck.

Tashi

Koi

Cyprinus Carpio

Physical Description: The Cyprinus Carpio, more commonly known as Koi are Japanese. They are often mistaken for goldfish.

The Koi at Sunrise Springs are orange with white splotches. They vary in sizes from four inches to three feet. Koi have tails that are as wide as they are. Their fins are sort of swishy. They have pretty small eyes and their mouths when they are open are an oval shape. Koi also have two barbells on the sides of their mouth.

Adult Koi weigh around five pounds but some have weighed up to eighty. Koi live from about thirteen to twenty years.

Habitat: Koi are kept in ponds. They don't have a "natural" habitat because they were bred in captivity. The Koi at Sunrise Spring's habitat is murky water with leaves and some sticks.

The temperature should range from thirty two to seventy degrees Fahrenheit. They need lots of aeration if the temperature rises. Pools should be five to six feet deep at the minimum.

Food: Koi are omnivores. They will eat any goldfish food that is already prepared. Lots of worms and insects fall into the pond. They are great for the fish's diet.

Predators: Koi have lots of predators. The predators at Sunrise Springs are only the Great Blue Heron and the Muskrat.

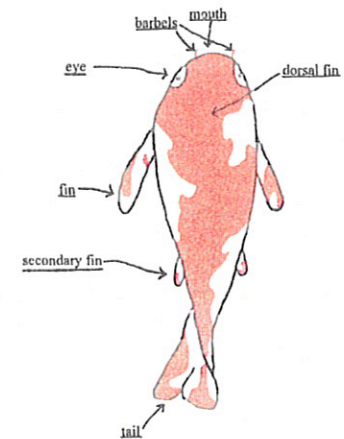
Most Koi are safe because they live in ponds and bowls. Just be careful if you have a cat. Koi in ponds that are in open areas should be careful of birds of prey. Northern Pike, Muskellunge and Large Mouth Bass can also eat them.

Interesting Facts: Koi over the centuries were bred and created by the Japanese from Wild carp. Koi can cost as little as five dollars and up to several thousand.

Koi have been divided into two different categories. The Asian Koi, which are more slender than the broad European Koi.

Koi are bottom feeders so they wreak havoc among mud and vegetation. They can also survive in polluted waters.

Female Koi lay their eggs in water plants. Koi in Japanese means Carp.



Walker

Dragonfly

Odonata Anisoptera

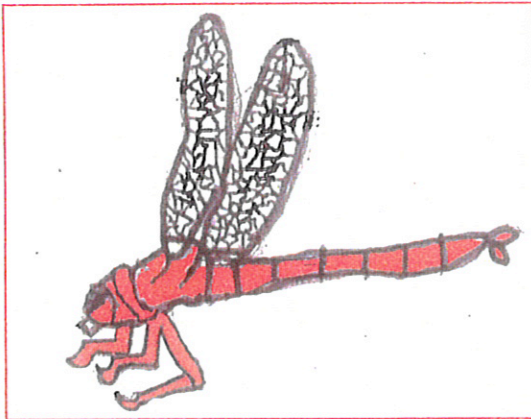
Physical Description: Adult dragonflies have a wingspan of $\frac{3}{4}$ " to 6" long. Their bodies are 1" to 7" long. Dragonflies are blue, green, yellow, red, or brown, with clear wings.

Habitat: Dragonflies live around warm ponds, lakes, and streams throughout most of the world

Food: Adult dragonflies eat other insects. The nymphs eat tadpoles and small fish.

Predators: Some bass, insect eating birds, and frogs.

Interesting Facts:
Dragonflies have been around for 300 million years.
Dragonflies can fly up to 60 m.p.h.
There are over 2500 species of dragonflies.
Dragonflies never rest with their wings closed
Life Cycle: Dragonflies start as eggs.



When they hatch they become nymphs and live in the water for 3 months to 4 years. Then they come out of the water and live 4 to 6 more weeks. They lay up to 100,000 eggs and soon die.

Megan

Bluegill Sunfish

Lepomis macrochirus

"A hand that looks like a gill cover"

Physical Description: The bluegill is a small fish that can weigh up to four and a half pounds. It has a long, green dorsal fin that extends from the base of the head to the beginning of the tail. The bluegill's tail is long and thin. It extends from the end of the pectoral fin. The name "Bluegill" comes from the dark blue patch at the end of the gill. The bluegill has a short supportive fin on either side. The colors on the upper body are green and black. On the bottom, it is yellow-orange. A jutting lower jaw gives the impression that the fish is pouting. That fact also gives the bluegill the nickname of "sad fish".

Habitat: The bluegill lives in ponds, lakes, and rivers throughout the United States. They favor banks and weed patches. Their green-orange color renders them almost invisible, when in the shade. They spend most of their time "sitting" along the banks of ponds.

Food: The Bluegill is a "sight feeder"-it eats anything that moves. Their main food source is debris from the bottom of ponds. They also have been known to feed off the carcass of a dead fish or frog.



Predators: The bluegill is low on the food chain. Its' main predator is man. The bluegill is considered a delicacy in many parts of the United States. Another predator of the bluegill is the Great Blue Heron. The heron considers the bluegill to be a tasty snack. In the Great Lakes, pike, pickerel and muskellunge consume over two hundred blue gill each day.

Interesting Facts: A cool fact about the bluegill is that the Army Corps of Engineers [A.C.E.] is using the bluegill to sense disturbances in the water. They discovered that when the bluegill senses poisonous chemicals in the water, it releases a small shock of electro-kinetic energy that can be picked up on a sensor. The A.C.E has installed sensors in several large bodies of fresh water; and introduced bluegills.

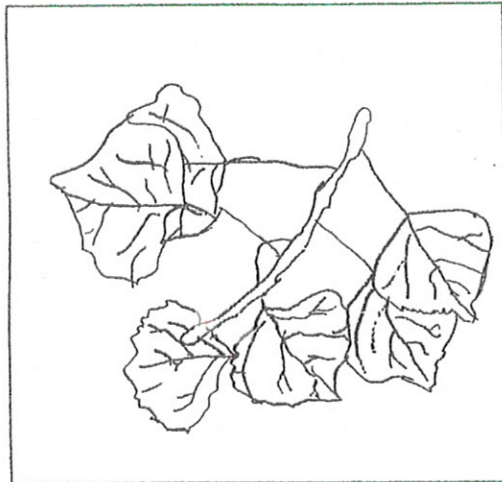
Mason

Cottonwood Tree

Populus deltoides

Physical Description: Often grows on streams. Can grow to a height of 27mm [90 ft]. The leaves are triangular, 7 to 15cm [3 to 6in]. Can live for 100 years. Massive trunks over 5ft in diameter. The females are the ones who can produce cotton. The cottonwood is a member of the willow family.

Habitat: Cottonwoods can be found near low water habitats. Grows on low water edges. Either marshes or ponds. Also the eastern cottonwood grows from New England, then to Saskatchewan and south to Texas and Florida. The black cottonwood is found on the edges of the pacific coast from Alaska to Mexico.



Predators: Cottonwoods predators are: the bark beetle, termites, also the human race.

Interesting Facts: Cottonwoods can be either male or female. The females are the ones who produce cotton [the cotton can be used for clothing.] The seeds are very small 1mm wide, 4mm long.

The cottonwoods have to survive prairie fires. Most cottonwoods grow on river edges. They develop a strong, thick bark while growing to maturity. Cottonwoods can live to be over 100 years old.

Cottonwoods can have these animals living in the cottonwood: raccoons, and opossums and even hives of honeybees.

The eastern cottonwoods can be made into furniture.

Sabe

Six-lined Racerunner

Enemidophorus Seolineatus

Physical Description: The racerunner greenish-brown or brown body has six-light strips on it. Their strips could change between the colors, light blue, grey, yellow or white. The stomach is typically white, but the male's stomach is blue. It can grow from six to nine and a half inches.

Habitat: The Six-lined Racerunner lives in: Florida, Georgia, Louisiana, Texas, Oklahoma, Eastern New Mexico, Kansas, Nebraska, Arkansas, Missouri, Mississippi, Alabama, Tennessee, South Carolina, North Carolina, Virginia. They generally live in rivers, ponds, woods, grassy lands and dry and sunny places.

Food: The Six-lined Racerunner eats little insects such as: ants, baby creatures and worms.

Predators: The Six-lined Racerunner's predators are: hawks, snakes, blue herons and Race Runners. The hawk can swoop down and can grab and eat, unless the lizard uses its defense mechanism. If one of the predators grabs the tail of the Six-lined Racerunner it falls off. He/she then runs away.

Interesting Facts: The Six-lined Racerunner relies on speed to capture and eat insects and also uses his speed to run away from predators. When the Six-lined Racerunner is exposed to the sun and has reached its temperature it can begin to hunt for food. If a predator catches the Racerunner by the tail, it automatically comes off. That then gives the Six-lined Racerunner time to run away.



Jesse

North American Bull Frog

Rana Castebenia

Physical Description: The North American Bullfrogs body is covered with freckled markings on its webbed feet and legs. On their back they have stripes. Their whole body is covered with a thick goo, and on their belly is a milky white color. Eyes are fairly small like pebbles. Their legs can grow up to 25cm/10in. Their body can grow up to 20 cm/8 in. Bullfrogs can be different shades of dark green.

Habitat: The bullfrog likes mossy and slimy places in ponds. You can sometimes find them sunbathing on rocks around ponds. They are native to near Arctic Regions like Nova Scotia in North America to South America.



Food: Moss, algae, pond snails, dragonflies, other bullfrogs, damselflies, grasshoppers, and any other bugs they can get their tongue on.

Predators: Raccoons, birds, garden snakes, muskrats, dragonflies, damselflies, small fish, ducks, some humans, and turtles.

Interesting Facts:
Some people in other places eat frogs as a delicacy.
When a male frog calls, it sounds like a deep voice, most like a bellow.
The North American Bullfrog is the biggest frog in the United States.

Some people have seen the Bullfrog feed on bats. In the wild, they can live up to 7-9 years, but if you catch one, and take care of it, they can live to 16 years.

Maddy

Muskrat

Ondatra Libethicus

Physical Description: The Muskrats fur is reddish or a rich brown with a silverfish belly. Its tail is long and naked, scaly and black. The Muskrats tail is that way so it can swim more swiftly. The Muskrats toes are partly webbed with stiff hairs. The Muskrat is two feet long from its nose to its tail. The tail is 8-10 inches and weighs 2-3 pounds



Habitat: Muskrats prefer to live in marshes and on the edges of ponds, lakes and streams that are also populated by beavers. Their "houses" are usually built in shallow water, and are built by cattails, reeds and mud, resembling a beaver's home. In deeper waters or in fast flowing streams they dig their burrows in the shorelines of the banks. The entrance to their homes is usually underwater. They remain active during the night and are used to seeing at dawn or dusk.

Food: Muskrats mostly are plant eaters. It depends on what is around them. When plants are not available they feed on clams, crayfish, frogs, and small fish. Muskrats have sharp claws so that they can grip their food.

Predators: The muskrat's predators are raccoons, coyotes, barn owls, and American Alligators. Muskrats are excellent swimmers and can evade many predators by escaping into the water or into their burrows and nests. They can remain underwater up to 15 minutes.

Interesting Facts: The Muskrats fur is the most valuable fur in the state of Virginia. Each year thousands of them are trapped. Fur pelts range from \$4.50 to \$7.00, depending on their color. Black pelts being the ones that fur buyers chose most often. Through the South, the flesh of the Muskrat is prized; at least eighty percent of the meat is kept as food.

Did you know many tales have been told that Muskrats keep chewing off their feet to escape traps? Muskrats start mating in the spring; on average there are 5-6 blind young that are born 20-30 days after breeding. There are usually 2-3 litters per year.

Michaela

Raccoon

Pro Comm Lot or



Physical Description: Raccoons have “bandits” masks around their eyes. Raccoons have pointed snouts and bushy tails with smoky gray and black stripes. Raccoons are medium sized animals that have long, a sharp claw on it’s human like paws that help it climb trees and catch their prey.

The raccoon has a dark nose and small, arched ears. The raccoon’s eyes are small, black and beady and often glow when in the dark, like cats eyes. Raccoons have long whiskers that are pretty bushy.

The raccoon is about three feet from nose to the tip of the tail when fully grown. A baby raccoon that is about one year old can be up to one foot. Adult males weigh from 10-15 pounds, while females are only slightly smaller weighing 6-12 pounds.

Habitat: You can find raccoons in and around ponds. Raccoons like to live in trees and under bushes that are close to the water. Raccoons prefer forested areas. Raccoons like to live in wooded and brushy areas along lakes and rivers and ponds. But the raccoons will sometimes make a home in farming areas where there are plenty of wetlands. Raccoons would prefer buildings and hollow logs and trees for their dens, but they sometimes will be found in ground burrows, rock crevices, junk and rock piles.

Food: The raccoon is an omnivore, and it can eat a wide variety of foods. Some of the raccoon’s favorite foods include small mammals, crayfish, frogs, small fish, eggs, domestic and upland game birds, grains, insects and berries. The raccoon is widely known for “washing it’s food” in water. Actually, its species name “lotor” means washer.

The raccoon will not hesitate to eat if there is any source of water nearby. Raccoons are very popular for being “garbage pests.” Trash is another delicacy of the raccoon’s.

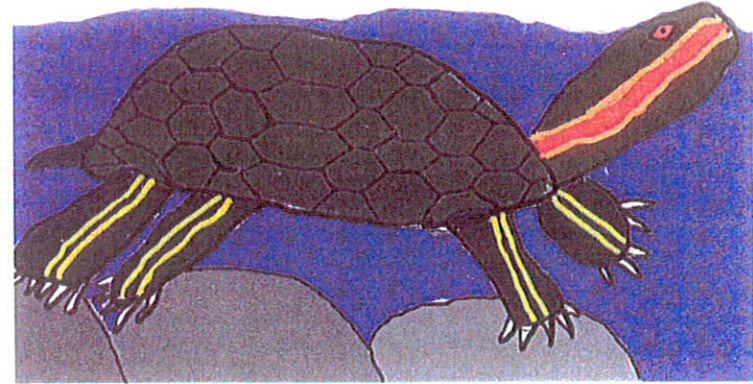
Predators: The raccoon’s main predator is the human being, for their tails, that are popular as hats and coat collars, but also for their unique markings that are also sometimes used on hats and coats. Another of the raccoon’s predators include owls and other large birds and large mammals: coyotes, bobcats etc.

Interesting Facts: If raccoons are overfed by human beings, they can weigh up to an amazing 60 pounds! Raccoons have a keen sense of hearing, also sight and touch. But taste and smell are not as developed. Raccoons are usually nocturnal, but some are diurnal, meaning they can come out in the daytime as well as nighttime.

Rikki

Red Eared Turtle

Trachemys Scripta Elegans



Physical Description: The males grow to about 5 to 7 inches from 2 to 5 years and females grow to 6 to 7.5 inches in 5 to 7 years. The adults mate from March to June. The females make a 3 to 16 inch wide and 2 to 4 inch deep hole. The female lays 4 to 23 eggs. They hatch in 60 to 75 day.

Habitat: They live in streams, swamps, ponds and rivers with soft bottoms.

Food: They eat Aquatic snails, tadpoles, crawfishes, crustaceans, mollusk, arrowheads, water lilies and duck feed.

Predators: Their predators are: large fishes, frogs, carnivorous turtles, snakes, large wading birds, and various mammals. Gars, Crows, mink, raccoons, otters and coyotes eat adults.

Interesting Facts: Even though they have many predators they have three defenses. One is they hide in their shell. Second, they go deep underwater and their color blends with their environment.

Ben

Water Lily

Nymphaeaceae

Physical Description: The Water Lily is a round green circle with a slit in its side. It also has a white flower that grows on the Water lily. The flower has a bunch of petals. The petals on the flower are pointy on both ends. The pad has a microscopic slime on the pad. The Water Lily has a stem that connects to the bottom of the pond or lake it's in. The Water Lily is beautiful as well as a plant that helps the environment.

Habitat: Water Lilies grow and live in ponds and sometimes lakes, usually on the edge and in shallow water. The area around their habitat is usually hot or warm. They grow where other plants don't usually grow. Because plants don't usually grow there it gets all the sunlight it needs. The Water Lily gets food and energy from sunlight so it's good not many plants live there. Water Lilies grow where there is a lot of oxygen.

The Water Lily grows in: NM, CA, ME, UT, NV, FL, AL, CO, MI, RI, TX, GA, S.C, and N.C.

Food: Water Lilies make energy and food in water. Water lilies make their food through photosynthesis. Otherwise their food comes from the water.

Predators: The water lilies predators are the muskrat and the raccoon. The Muskrat and the raccoon only eat the pad not the stem. Since those animals don't eat the stem the pad is able to reproduce. Other wildlife also eats the water lily like fish.

Interesting Facts: Did you know that water lilies were once used in Egyptian art? Well it's true. The largest water lily can be 2 feet to 6 feet across.

Joia



Common Carp

Cyprinus Carpio
Family cyprinidae

Physical Description: The adults normally weigh (no more then 5 lb). Specimens normally weigh no more than 80 lb. that have been recorded.

Color: olive/brown. Color at Sunrise Springs (SRS) / orange on the fins. White on the stomach.

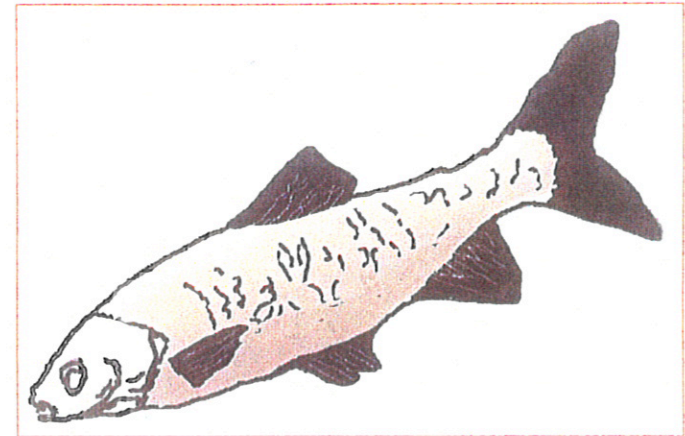
Habitat: Muddy ponds (SRS) or small to large rivers and lakes. Man made lakes and slow moving streams. They prefer warm water.

Food: The Common Carp is a bottom feeder.

Predators: Wild cats and people.

Interesting Facts: Belongs to the minnow family. Carp originated in China in the late 1800's.

Their exotic variations in color, size, and species were bred. During the cold months the carp stop eating and stay near the bottom of the ponds and hibernate. When the water levels get low the carp burrow into the mud in order to survive for weeks. Carp breed rapidly.



Forest

Great Blue Heron

Ardea Herodias

Physical Description: Great Blue Herons are very beautiful. They have small black strips over each eye that goes to the back of its neck. Its main color is a gray blue color with a mix of white. Their legs are long and very yellow with strange red things on them. Their bills are a strange yellow color. It is very long and beautiful.

Blue Herons are in the range of three feet and four feet. Males are usually bigger than females. Most of the time, they die in their first year. Their wingspan is six feet long.



Habitat: Great Blue Herons live in fresh or salt-water. They live in lakes, ponds, streams, swamps and seas. You can find Blue Herons along the side of the Rogue River in the Northwest to Florida in the south. You can find them in almost every river or pond.

Food: Great Blue Heron eat lots of small animals, such as snakes, small mammals, lizards, fish, frogs, insects and some plants like lily pads

Predators: Great Blue Herons can be eaten by

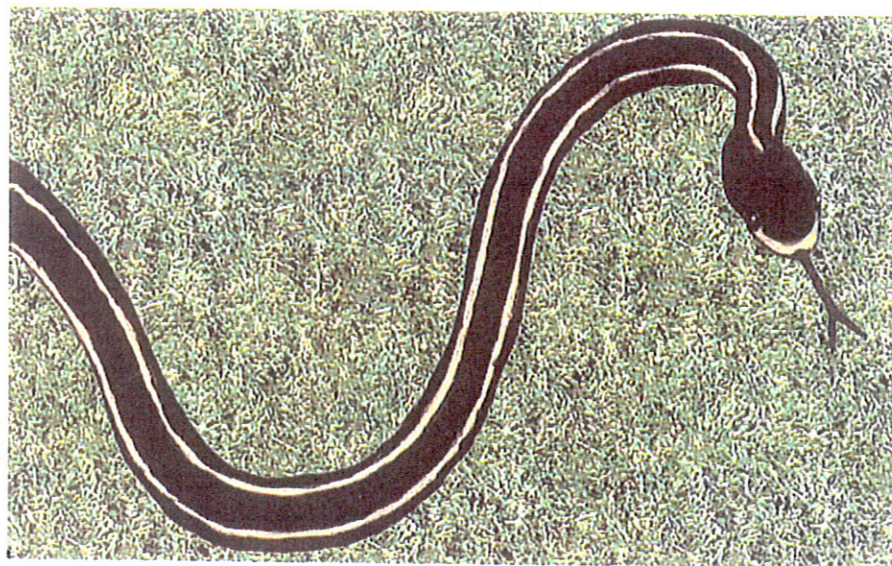
quite a lot of things like coyotes, crocodiles, mountain lions, red tailed hawks, and bears. Raccoons eat their eggs, and people kill them by destroying their water habitats.

Interesting Facts: Great Blue Herons make nests in colonies together. Also herons don't like being disturbed by humans.

Althea

Garter Snake

Thamnophis sirtalis



Physical description: The garter snake is a black snake with yellow stripes; it can grow up to 4 ft, and 1 and a half-inch long, and has a narrow head and a purple or blue tongue.

Habitat: The Garter Snake is found near grassy areas and ponds. It lives in California, Nevada, Texas, and New Mexico.

Food: The Garter Snake eats toads, frogs, small fish, rodents, insects and sometimes eggs.

Predators: The Garter Snake is a common food for herons, big rodents, and bats.

Interesting Facts: When the Garter Snake is scared or caught it lets out a funky stench, that makes you want to gag.

Norbu