



Florida's Wild Future

Curriculum and Teacher's Guide



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INTRODUCTION

SYNOPSIS

In “Florida’s Wild Future” wildlife experts Jason and John introduce students to seven species of animals native to the state of Florida. Jason brings the ***Tiger Homes Sanctuary’s*** knowledge and experience so that viewers learn important physiological and behavioral information about: **American River Otters, Florida Panthers, Red Tailed Hawks, American Alligators, American Crocodiles, Gopher Tortoises, and Kingsnakes.** Additionally viewers are introduced to some of the threats facing these magnificent animals, and a list at the end of the programme provides viewers with a list of conservation organizations involved in their protection.

PROGRAMME OBJECTIVES

Together the film and activities are designed to give students an introduction to some of Florida’s native wildlife. At the end of the unit students should have:

- Learned the basic natural history of the seven species presented in the film
- Have learned and used some or all of the vocabulary provided in the curriculum
- Enhanced their Natural History research skills in both printed and on-line formats
- Gained an understanding of some of the conservation issues facing Florida wildlife
- Integrated science and creative skills in an informative and aesthetically pleasing way

Curriculum Objectives

This Curriculum is designed to give teachers some very basic background information about Florida wildlife and their place in the animal kingdom in order to better help them teach about these animals, and to pursue further explorations in zoology, wildlife, and conservation. A set of activities in the form of longer projects and shorter work sheets and quizzes have been provided to enhance students’ understanding of zoological concepts and methods, and to help them integrate analytic, research and creative skills. Teachers are encouraged to modify any of these activities to best serve the learning needs of their students.

Elements of this programme (Field guide entries, quizzes, work sheets) have been formatted to allow teachers to photocopy them easily for class distribution.

The project-length activities can be used and modified for a broad range of ages and learning abilities.

Each of the four quizzes varies in degree of difficulty, #1 being the easiest and designed with 3-5 graders in mind, number four appropriate for students up to early high school level. Answer keys are provided.

Vocabulary

- **Crocodylian:** Member of the order of large amphibious reptiles that include crocodiles, alligators, caymans and gharials. All species have short legs with clawed and webbed toes. They have long snouts, with strong jaws, and a massive, powerful tail
- **Carnivore:** A) An animal or plant that eats flesh b) Any member of the mammal order of 'Carnivora.' *Note: not all mammal carnivores are dietary carnivores... many canid (dog/fox) species, and bear species are omnivores(eat plants and flesh) and one, the Panda is vegetarian.*
- **Aquatic:** Growing or living in or near water
- **Semi Aquatic:** Spending part of a life cycle in or near water
- **Predator:** An animal that feed on other animals
- **Habitat:** The natural home of an organism
- **Ecosystem:** a community of organisms and the physical environment in which they interact
- **Raptor:** A bird of prey... including eagles, hawks, falcons, and owls
- **Hawk:** A member of the *accipiter* genus of birds. All hawks are diurnal, with curved beaks, short rounded wings and long tails. Hawks are *birds of prey*

- **Semitropical:** Describes a climate that has predominantly tropical qualities, hot often humid etc. but that is subject to seasonal colder spells and occasional frost.
- **Bird of prey:** A bird which hunts animals for food: includes hawks, eagles, falcons and owls
- **Species:** Plants or animals with clearly defined characteristics that can interbreed and produce viable (non sterile) offspring.
- **Food Chain:** A sequence of organisms each depending on the next in the sequence as a source of food. A food chain with a cougar at the top of the chain might be: grasses, deer, cougar
- **Terrestrial:** Ground dwelling. Animals that spend most of their lives on the ground are *terrestrial*
- **Venomous:** Containing, secreting, or injecting venom or poison
- **Evolution:** The means by which biological organisms gradually change from simpler to more complex forms
- **Constrictor:** A snake that kills its prey by coiling its body around the prey and compressing.
- **Olfactory/olfaction:** Pertaining to the sense of smell/ the sense of smell
- **Jacobsens's organ:** A sense organ in the roof of the mouth of many animal species. Part of the olfactory system, the organ uses a combination of taste and smell. In snakes information is carried to the Jacobsen's organ on the animal's forked tongue
- **Nocturnal:** Active at night
- **Diurnal:** Active during the day

A Guide to Some Native Florida Species

Florida is a state rich in a broad range of wildlife species. Below, in field guide format are brief descriptions of the species described in the film.

American Alligator *Alligator mississippiensis*



Residents of great river swamps, lakes, bayous, and other bodies of fresh water in Florida, the Gulf, and lower Atlantic states. While they can survive in salt and brackish water for brief periods of time, they live in fresh water since they do not have a salt processing gland as do their crocodile cousins. The full grown American alligator is dark, though sometimes the paler markings of juveniles may last into early adulthood. These reptiles are baskers, laying in the sun to raise their body temperature to a working level. Females make nest mounds of vegetable matter which they protect from spring to autumn when they are incubating young.

Size:

Body length, 6-16 ½ feet (average female length 8.2 feet, average adult male length 11.2 feet)

Weight, Adult males can weigh ½ a ton

Life Cycle:

Sexual maturity, when they are about 6 feet long, usually 10-12 years of age

Life span, unknown

Reproduction:

Mating Season: April-May

Number of eggs: 35-88, average 50

Incubation: Approx. 65 days

Diet:

Juvenile, invertebrates especially insects, small reptiles, amphibians and fish

Adults, fish, turtles, snakes, small mammals, birds

Predators: As Juveniles, various including herons, eagles, raccoons, etc. As adults none except humans and occasionally other alligators

Social Structure: Mostly solitary but individuals come together in the mating season and newly hatched juveniles live in small groups called pods

Territory Size: Males 2 square miles or more, females varied but much smaller

Conservation Status: Threatened: While there are healthier numbers of Alligators than crocodiles in North America, the two species are often confused. As is true for all large aquatic and semi aquatic species habitat is shrinking due to human expansion and development

American Crocodile *Crocodylus acutus*



Crocodiles are very rare in the United States and are only found along the Florida coast in the bay area, in Everglades National Park, and in the keys. Throughout their worldwide range, from Western Mexico to Ecuador along the Pacific, and from Guatemala to Florida along the Atlantic, they live in coastal wetlands. Unlike their alligator cousins the adults can tolerate a saline aquatic environment. Another comparative difference to the alligators lies in the fact that males will sometime help to guard nesting areas and hatchlings. Adult Crocodiles maintain dens near nest sites... usually a burrow which they dig in stream or creek beds. Unlike the alligators, female crocodiles don't cover usually their eggs with a mass of vegetation but bury them in mounds of soil or sand; some excavate nest holes. Two or more females may share a nest area.

Size:

Body length, 7 1/2-12 feet (confirmed record 15 feet)

Weight, 150-450 lbs.

Life Cycle:

Sexual maturity, when they are about 7 feet long, usually 10-12 years of age

Life span, 60-70 years in stable environment

Reproduction:

Mating Season: March-May (in the US... usually timed to dry season throughout range)

Number of eggs: 20-60, average 38

Incubation: Approx. 90 days

Diet:

Juvenile, invertebrates especially insects, small reptiles, amphibians and fish

Adults, fish, turtles, snakes, small mammals, birds

Predators: Hawks, perhaps larger carnivorous mammals including bob cats and mountain lions

Social Structure: Solitary

Territory Size: Unknown

Conservation Status: Endangered

Florida Kingsnake *Lampropeltis getula floridana*



As is true of many snake species, the broad range of kingsnake behavior has not been studied. All kingsnakes are constrictors and in addition they are immune to the venom of native poisonous snake species. Their name may have come from the fact that they were perceived as the 'king of snakes,' i.e. able to eat almost any other snake species. They live in a broad range of habitats from woodlands, to prairies and marches. While usually considered diurnal animals, they have been observed in active behavior at night.

Size:

Body length, 38-48 inches

Life Cycle:

Sexual maturity,

Life span, unknown

Reproduction:

Mating Season: Late spring-early summer

Number of eggs: 3-30

Incubation: 65-90 days

Diet:

Snakes, lizards, frogs, birds, eggs, rodents

Predators: No significant predators (birds of prey when young)

Social Structure: Solitary

Territory Size: Unknown

Conservation Status: No Special Status

American River Otter *Lutra canadensis*



The North American river otter is one of the most popular and endearing of the continent's mammals. This popularity stems from their perceived playfulness and seemingly boundless energy. Otters have extremely high metabolisms which require that they spend large portions of each day eating... it may also account for the fact that they never store food but consume their prey immediately upon capture.

Otters like many mustelids (the family of mammals that includes weasels, badgers, wolverines etc.) have a reproductive adaptation called delayed implantation. This means that immediately after fertilization, the embryo goes into stasis, and only resumes when conditions are favourable for implantation and eventual birth. While Otter gestation is 63-65 days actual birth usually occurs 10-12 months after mating.

Size:

Body length, 26-30 inches

Weight, 10-25 lbs.

Life Cycle:

Weaning, 3-4 months

Sexual maturity, 2-3 years

Life span, 15 plus years (in captivity)

Reproduction:

Gestation Period, 63-65 days (but have delayed implantation... birth 10-12 months after mating)

Young /birth, 1-5

Birth season, March-April

Diet:

Fish, Amphibians, crayfish, and other invertebrates, they may also eat birds, eggs and small mammals when available

Predators:

None except man

Social Structure:

complex, often in pairs, but sometimes in larger social groups

Territory Size:

None territorial, but have large ranges covering many miles of waterfront

Conservation Status: No special status but the animals are losing habitat to human encroachment

Florida Panther/Puma/Mountain Lion/Cougar *Felis concolor*



Mountain lions are one of the most broadly distributed large mammals in North America. Mostly solitary, adults come together only in the breeding season; for the rest of the year they are extremely territorial. The cats are careful never to have a population density that will in and of itself deplete the food supply.

They are primarily nocturnal and crepuscular, but on rare occasions can be observed during the day.

Size:

Body length, 3.5-6 feet

Weight, 66-220 lbs.

Life Cycle:

Weaning, 6 months

Sexual maturity, 1.5-3 years

Life span, 15-18 years

Reproduction:

Gestation Period, 92-96 days

Young /birth, 2-4

Birth season, March-April

Diet:

Mammals of any size, ground dwelling birds, occasionally reptiles

Predators:

None except man and in areas where they still live, wolves have been observed preying on cougar cubs

Social Structure:

Solitary

Territory Size:

Approx. 18 square miles but depends on prey density

Conservation Status: Threatened

Red tailed Hawk *Buteo regalis*



Red tailed Hawks are one of the most broadly distributed and adaptive birds of prey in North America. They live in a wide range of habitats from Northern Alberta in Canada, through Mexico, into Central America and east to Cuba. They tend to form permanent pair bonds, are sometimes migratory and have in some areas adapted to life in urban habitats. Pairs will often use the same nest sites year after year. As is true with many birds of prey, both parents incubate and feed the young. They are very territorial and on clear days patrol their domains from the sky search for intruders

Size:

Body length, 19-25 inches

Life Cycle:

fledging 44-46 days

Sexual maturity, 1.5-3 years

Life span,

Reproduction:

Incubation Period, 28-32 days

Clutch size 2-4 eggs

Birth season, March-April

Diet: small rodents, rabbits, reptiles, smaller birds

Predators: no significant predators

Social Structure:

Bonded pairs

Territory Size: ½ to 2 square miles

Conservation Status: No special status

Gopher Tortoise *Gopherus polyphemus*



Gopher tortoises are so called because of their burrowing habits. They excavate and live in holes and tunnels that can be 40 feet long, and are wide enough to turn around in. Newly hatched tortoises immediately either find an adult burrow or dig one of their own. The tunnels tend to maintain a constant temperature and therefore protect the animals who live there through extremes of weather and fire. The tortoises are not the only inhabitants of their burrow, snakes, skunks, armadillos, burrowing owls, and scarab beetles are among the approx. 360 species of animal known to use the tortoise excavations. Ancient Indians used the Gopher tortoise as a form of currency.

Size:

Body length, 6-9 ½ inches

Life Cycle:

Sexual maturity, Uncertain, somewhere between 15 and 21 years

Life span, 60-80 years in stable environment

Reproduction:

Mating Season: April-June

Number of eggs: 3-15

Incubation: Approx. 80-100 days

Diet:

Low growing vegetation

Predators: Adult tortoises have few natural enemies but eggs and hatchlings are preyed on by raccoons, foxes, skunks, armadillos, and fire ants

Social Structure: Mostly solitary except in the breeding season

Territory Size: Unknown

Conservation Status: threatened through much of their range. Keynote species that can indicate the overall well being of an ecosystem

Individual and Class Activities

Each of the thirteen activities listed below are projects that are suitable for individual students, groups within a class, and for whole class participation. All of the activities are designed to be modified by each teacher using them to best suite the needs and abilities of the students within his or her class.

Which Came First?

A number of species in the film are 'egg layers,' but after the clutches are laid parenting strategies differ radically. Red tailed Hawks lay just a few eggs and "are hands on" (or wings on) parents. In crocodile families, fathers have no direct parenting role but the mother guards the eggs and young hatchlings. Gopher tortoises take no part in the lives of their young after the eggs are laid.

Have students pick two species of egg laying animals, either those covered in the film or other species of their own choosing (this could include insects, amphibians, fish or even egg laying mammals called monotremes), and research their behavior in printed sources and/or on the web. After researching the parenting strategies of the animals they have chosen students should compare their parenting strategies. This can be done in a standard report format but can be accomplished more creatively by students imaging themselves in the role of a parent. Taking on the parts of parents, they can either write a play wherein representatives of each species argue the relative merits of their child rearing practices, or keep "diaries" wherein the fictional parents record the period of offspring raising, from egg laying to the offspring becoming independent. An important element that these creative efforts should show is a clear understanding of methods that the species use to successfully (or unsuccessfully) raise the next generation.

After the class has completed their egg laying research groups can discuss and speculate about why individual species may have evolved the method they use. What are the advantages of the hands on parenting practiced by Red tailed Hawks? What are the benefits of the multiplicity of eggs laid by gopher tortoises?

Objective: understanding of various parenting strategies in nature, developing research skills, contrasting related qualities and behaviors in nature

It's A Vision Thing

Red tailed Hawks hunt mainly using their sight; as is true for most humans, vision is their dominant sense. But as is the case with most raptors, 'Red Tails' visual acuity is significantly better than ours. Have students explore the sense of sight in nature. Have each student pick three species that rely on vision to help them navigate the world. Variation in their choices will provide the best results... a vulture species, a spider species, a primate for example.

Having researched their chosen species have each student (or groups of students) create visual projects, perhaps art forms that attempt to show the world from the visual perspective of a spider, or the savanna from the perspective of an Egyptian Vulture gliding at 15,000 feet. Students could also try and imagine their lives if they had the visual ability of an eagle, or a nocturnal mammal; have them write an account of a day in the life of a member of a fictional human society whose inhabitants see far better than we do.

Objectives: an enhanced understanding of the sense of sight, knowledge of variations in the uses and qualities of sight in different species

Do You Hear What I Hear?

For many animals sight is not the primary sense they use to interpret their world. Hearing is a sense that many animals rely on most heavily. Many owl species, while they have wonderful night vision, hunt more with their ears, and can catch prey even when there is **no** light to see by. Coyotes and Foxes can hear small animals below ground, and pounce on them with amazing accuracy using sound as their only guide. Have students explore what sounds animals hear: movement, vocalizations etc., ... and at what levels, high frequency, low frequency etc.

Having discussed the role sound plays in the lives of many animals, have students break up into pairs. Either during class time, or as an after school assignment have one member of the team blindfold the other, take them to an unnamed destination, and lead them around the area for half an hour. During this time the guide student should not speak (unless the blindfolded partner is in danger). The guided student should note all that she or he hears, the sounds on the way to and at the destination. After half an hour the blindfolded student should attempt to guess their location. Whether their identification is

correct or incorrect, after revealing the location the guided student should make a list of the significant sounds they heard. The pair should then change roles and the exercise should be repeated on a second day. When all the students have been both 'guided' and 'led,' the class should come together and discuss the sounds they heard. What auditory clues did they get to their locations? What sounds did they observe that they had not really noticed previously? Did they hear more when they did not have their eyes to rely on?

Variation: For students who might prefer to work alone or for a more meditative version of the activity, have students pick a favourite outdoor place. They should then blindfold themselves and sit quietly for 15 minutes to half an hour, and observe the sounds they hear.

Note: For both of the previous activities there are many good web sites which may be of help. An excellent one, ***Neuroscience for Kids*** can be found at www.faculty.washington.edu

Objectives: an enhanced understanding of the sense of smell, knowledge of variations in the uses and qualities of olfaction in different species

The Neighborhood

Florida is a state rich in wildlife species, but even much smaller areas, like our own neighborhoods, are more richly populated than we usually imagine. Using a map of your school district as a base, divide the area up into sections. These should be neighborhood-sized chunks that students can safely walk in an hour or so. Break the students up into groups of 4-6 members and assign a group to each area; if possible the groups should live in or near the areas to which they are assigned. When possible each group should have some park or open space as part of their area.

After school or on a weekend each student should walk through his or her area. They should do this alone or in pairs, but not the whole group together. As they walk each student should make a list of the animals that they see. If they have field guides they may use them to identify bird, insect and mammal species as they explore.

After all the students have made their lists, they should compile a group list. If possible they should note the times when animals were observed and if there are species that they could not identify, field guides and web sites should be used to help them make as accurate identifications as possible... "big black bird" is not an adequate identification.

When all the groups have compiled their lists the class should come together and make a list of all the species observed in the school district.

-A Class map can be made with markers denoting where certain species were observed.

-Were certain species observed at specific times?

-Were some species seen more frequently in some neighborhoods than in others?

-What animals were seen in greatest numbers (domestics cats and dogs don't count)?

-What animals were seen in least numbers?

Discuss if students saw just the 'big' or obvious animals? Where insects observed? Were other invertebrates observed?

When a list of local species have been compiled the class might want to discuss what makes it possible for certain animals to live side by side with humans. Are there places in the neighborhoods for animals to live? What are the food sources for these species?

How do we feel about sharing our immediate environment with other animals? How would we feel if these animals weren't here?

Objective: an enhanced awareness of the animal diversity in students' immediate surroundings, development of observational skills

The Neighbors

Using the same area designations as in the previous activity, have each student pick an area and a single species known to be regularly observed in that area. Each student should be given, or should make, a map of their area/neighborhood. Over a two-week period each student should try and observe their chosen species for 2-3 hours, in 20-30 minute increments. The observers should vary their observation times. During each observation period students should take notes on the species they are observing. They should note if the animals are feeding, sleeping, playing, interacting with one another etc. As they observe they should mark their maps with the locations where their subjects were seen.

At the end of the study period have the students report on their observations. The report should include conclusions about when the animals are most active, whether they are more social or solitary, whether they have dens or nests in the observation area, where and what they eat. Are they dependent in any way on their human neighbors?

At the conclusion of the activity the class may wish to make an almanac of the local species.

Objective: an enhanced awareness of the animal diversity in students' immediate surroundings, development of observational skills

It's a Small World

We are relatively used to observing animals in broad areas: gardens, forests, meadows, the beach. We see the 'big animals' and it often doesn't take too much effort to watch certain aspects of their lives, especially if we know where and how to look. But the natural world is a place where many things happen on a small scale, and the greatest number of species live 'under our radar.'

Divide the class into groups of 2-4 students and take them into a park, beach, garden or forest area. Equip each group with gloves, a notebook, hand lens, and measuring tape. Have each group mark out

a one-yard or meter square. First of all they should draw or write an initial observation of their site. They should note the objects in their study area: logs, grasses, rubbish, rocks, water puddles etc. Then using their naked eyes and their hand lens they should make a list or drawings of as many animals as they see. They should turn over objects with care and disturb their subjects as little as possible; all objects should be returned to their original position if moved. No student should put their hands into holes or crevices.

When the activity is complete lists and drawings should be brought back to class and as many species as possible should be identified with field guides and texts.

How many species were observed? How big were the animals? Did students observe them in any recognizable activity (hunting, eating etc.)? What conclusions can be drawn from the diversity of life in the 'square yard ecosystem'?

Note: If species remain unidentified students can send pictures and descriptions to biologists for identification. In some cases the experts at www.tigerhomes.org can help in identification, and www.madscientist.com is another good source of assistance with identification of species and behavior

Objectives: enhanced awareness of bio-diversity in small overlooked areas, an introduction to micro zoology

Lions and Otters and Snakes Oh My

In the film students were introduced to six native Florida species. Due to loss of habitat it is becoming harder and harder to see these species in their native environments. But research on the web and in printed sources will give students information about the how these animals live in the wild.

Divide the class into groups and have each research in detail the lives of one of the species covered in the film. They should learn what each species eats and what species prey on them (if any), the habitat/s in which they live, the types of nests or lairs in which they make their homes, whether they are social or solitary.

When the research is completed, have the students make a model or mural of the animal's habitat. The picture or model should show the

animal in its native environment, predator and prey species etc. These artistic renderings can stand independently or the class can work together to create one that includes all the species. This would become a very large model of mural.

Having created a record of the animals' habitat, students can then explore the conservation efforts being made for each species. Some are listed at the end of the film, others can be found on the web. To accompany their art work students can make a guide list of the local organizations and individuals working to protect the animals.

Objectives: deepened knowledge of species depicted in the film "Florida's Wild Future," research skills development

A Tiger Homes Lesson

Modern technology is allowing scientists and non-scientist new glimpses into the lives of many species.

Have students log on to the tiger homes web site at www.tigerhomes.org and visit one of their camera sites. Here we can see a great way that technology allows us all to observe the behavior of lemurs and tigers and lions. But the use of technology isn't limited to experts. Students can make their own video or still footage records of the behavior of animals closer to home.

If the class has a pet, (hamster, mouse, guinea pig etc.) a video camera can be used to record the behavior of even this familiar friend. Set up the camera near the cage, focus it on the occupant's feeding area and run the camera at the time when he or she usually eats. Or set the camera to cover the whole cage area and run it for half-hour periods when the occupant is active.

Often the camera will catch behavior that the casual observer misses. And when viewed slowly and carefully new things can be learned.

-Does the subject eat food in a particular way? If its diet is a mixture of foods, are some eaten first? Are others ignored?

-Does the subject groom in a special area in its cage? Does it eliminate in a particular area? Does it play in a particular area?

-How does the subject groom itself?

-What kind of vocalizations does it make?

By slowing down the tape speed details of behavior can be observed and students can pause tape to look at details of anatomy and perhaps draw and study them further.

If students make a particularly good tape the guys at Tiger Homes would be thrilled to see it and perhaps put it up on their web site. Contact information is available at the site.

Objectives: deepened understanding of animal behavior, application of technology to study of animal behavior

The Powers of Myths and Myth Makers

Modern scientists can tell us a great deal about the lives of the animals with which we share our world. But native peoples have always been keen observers of their animal neighbors. Their understanding helped them to live side by side, often in relative harmony with the other animals in their world. Their knowledge also helped them be effective hunters of prey, and evaders of potential predators. Indigenous peoples had a deep respect for the plants and animals they encountered. This respect was/is displayed in many ways... not the least of which lies in the stories they told about the animals.

Have students research Native American myths associated with a species native to North America. There are numerous sites on-line, and books such as "***American Indian Myths and Legends***" are good sources for some of these stories.

Have each student bring one of these stories to class and retell the tale to their classmates. They should not read the stories aloud; but tell them as the original participants would have told them. After completing the tale, have the class discuss how the observed behavior of the animal in the wild might have been the inspiration for the story created about them.

Have students choose an animal they have studied and or observed in some detail and have them make a modern myth about that animal. The story should in some way (this can be tenuous) reflect an element of the animal's behavior, but should also tell us something about the world in which the student lives.

Have students choose a Native American animal myth, or one that they or their classmates have written and create a piece of illustrative artwork. These can be contemporary in style or can reflect a traditional style of art.

Objectives: introduction to Native American perceptions and observations of native species, integration of science and art

The Old Ones

Many of the species in the film have been around a long time. Tortoises and crocodilians are some of the oldest families of animals living on the planet today; they were old even when the dinosaurs roamed Florida.

With your class explore and research the ancient biology of Florida (or another state) and find out what animals lived there between 100 and 60 million years ago.

- What was the terrain like in this period (the cretaceous period)?
- How is it different today?
- Were there mammals in this period? Are any that lived then still living there now?
- What attributes might have helped the oldest species living today (such as tortoises) survive when other species died out?

After research and discussion have students create a picture or model of Cretaceous era Florida. In it include one of the contemporary animals that lived then.

Have students imagine themselves living in that period. Have them write an account of a day in the life of a cretaceous era crocodile or tortoise. The account should show knowledge of the animal's real wild behavior and of some elements of cretaceous conditions.

Objective: an introduction to Florida's evolutionary history

Red Tail's and Their Cousins

Red tailed Hawks are splendidly adapted birds of prey that can be found throughout most of North America. Have students research Red

tail behavior in text sources and/or on the web. Their final information should include but do not need to be limited to:

- Range and habitat
- Size (male and female)
- Variety of prey species
- Territory and/or range size
- Activity times (nocturnal, diurnal, crepuscular)
- Migratory habits
- Nesting season
- Clutch size
- Incubation period
- Fledging age
- Parental involvement in chick rearing
- Social habits
- -Conservation status

Having completed their Red-tailed Hawk research, students should pick another bird of prey and complete a similar survey. When both studies are finished have the students compare the two species. The information can be presented in chart format, in a narrative version, or in a combination of the two.

Objective: deeper knowledge of Red tailed Hawks, knowledge of a related species, development of research skills

Playing With Otters

River Otters live throughout most of North America and they have a very close cousin, the Eurasian otter which is very similar in both anatomy and behavior. But two other cousins, the Giant River Otter (South American species) and the Sea Otter have rather different biologies and behavior. In text and/or on-line sources have students research the behavior of North American River Otters and that of one of their more dissimilar cousins. When they have completed their research have them write a series of pen pal letter from a member of one species to a member of the other species. The letters should be as creative as possible but should also display a knowledge of the comparative behaviors of both species.

For the more visually creative students the pen pal letters can be replaced with pictorial diaries or cartoons, but again the pictures should show an understanding of the behaviors of both species.

Objective: deeper knowledge of American River Otters, knowledge of a related species, development of research skills, integration of scientific and creative skills

T is For Tortoise

The Gopher Tortoise is considered an indicator species for the health of the habitats in which they live, because many species share their tunnels and feed on their eggs. They are also animals who live a very long time, up to eighty years. Have students study the behavior of the tortoises and also the terrain in which they live. In Florida, the habitat that a turtle was born into 80 years ago may be very different in some respects than it is today. Have the students create a fictional Gopher tortoise born 80 years ago... and in a narrative form tell a fictional descendant about what life was like in the old turtle's youth. The story should indicate an understanding of Gopher turtle behavior, and an understanding of some of the changes that have occurred in technology and environment in that period.

Variation: A more speculative story could be told from the point of view of a tortoise born in 2003 when that same tortoise is in its 80s.

Objective: deeper knowledge of Gopher Tortoises, development of research skills, integration of scientific and creative skills

***I catch my prey,
Who am I?***

I am a _____

Conservation Work Sheet

1. On the web, in printed sources or through personal knowledge find the names of 3 conservation organizations that work to protect any of the species covered in the film.
2. Find the phone numbers of at least one of these organizations.
3. Find a web site for at least one of these organizations.
4. By calling them or searching on the web find and list the conservation area nearest to your home or school set aside to protect one of the species listed in the film.
5. By phone or web site learn how young individuals or student classes can participate in the conservation of at least one of the species covered in the film. List at least two such activities below.
6. Find and list two other endangered or threatened species that are native to the United States.
7. A few years ago Bald Eagles were an endangered species in the United States. In the last few years their numbers have increased and they are now classified as "Threatened." Research the methods by which Bald Eagles were and are protected and list some of the actions that helped to improve their conservation status.

Quiz #1

For each of the following circle the correct answer

1. Another name for cougar is:

(A) Otter (B) Mountain Lion (C) Raptor (D) Tortoise

2. King Snakes are:

(A) Venomous (B) Non venomous

3. Red Tailed Hawks may have evolved from:

(A) Worms (B) Crocodiles (C) Otters (D) Dinosaurs

4. Gopher Tortoises are:

(A) Amphibians (B) Mammals (C) Reptiles (D) Birds

5. River Otters have which of the following to help them swim?

(A) Fins (B) Webbed Feet (C) propellers (D) Claws

6. Alligators and Crocodiles have a nictitating membrane that protects their:

(A) Feet (B) Eyes (C) Tails (D) Teeth

7. All the animals in the film are hunters except:

(A) Gopher Tortoises (B) Otters (C) King Snakes (D) Red Tail Hawks

8. Which of the following species from the film are not aquatic?

(A) Alligators (B) Otters (C) Crocodiles (D) Gopher Tortoises

9. Cougars are unlike other big cats (lions, tigers etc.) because they:

(A) Purr (B) Use their claws (C) Eat plants (D) Jump on their prey

- 10. Gopher Tortoises are unusual members of the turtle family because they:**
(A) Eat vegetation (B) Have protective shells (C) Dig tunnels (D) Lay eggs

Quiz #2

For each of the following blanks pick a word or term from the list below which best completes the statement. Each phrase or word can only be used once.

- An otter's thick (1)_____ keeps water from its skin as it swims.
- Red tailed Hawks are (2)_____ ; they hunt for their food.
- Florida Panthers are also called (3)_____ or (4)_____ .
- Crocodiles and Alligators have a special (5)_____ called a nictitating membrane .
- Alligators and Crocodiles are both (6)_____ .
- Gopher Tortoises are not (7)_____, since they only eat plants.
- Kingsnakes are (8)_____ which means they overcome their prey by squeezing them.
- List the four species described in the film that are reptiles (9)_____, (10)_____, (11)_____, (12)_____ .
- Animals that spend most or all of their time in water are called (13)_____ .
- Kingsnakes use their forked tongues and their (14)_____ to smell.
- Florida Panthers and American Crocodiles are endangered animals in Florida due mostly to loss of (15)_____ .

**(A) JACOBSEN'S GLAND (B) FUR (C) SCALES (D)
KINGSNAKE
(E) ELEPHANT (F) CONSTRICTORS (G) BIRDS OF PREY
(H) NOSE (I) EYE LID (J) GOPHER TORTOISE (K) AQUATIC
(L) HABITAT (M) AMERICAN ALLIGATOR (N) COUGARS
(O) AMERICAN CROCODILE (P) MAMMALS (Q) REPTILES
(R) MOUNTAIN LIONS (S) PREDATORS**

Quiz #3

Circle the correct answer or fill in the blank.

1. Florida has such a wide range of species that live in warm temperatures because the climate is:
(A) Nocturnal (B) Temperate (C) Arctic (D) Semi Tropical
2. American Crocodiles have glands in their mouths that help them excrete: (A) Sand (B) Seaweed (C) Salt (D) Sugar
3. This gland allows crocodiles to live in the shallows of: (A) Seas and Oceans (B) Ponds (C) Rivers (D) Lakes
4. A dietary carnivore consumes food that is almost all _____.
5. Loss of _____ is a major threat to many Florida animal species.
6. Red tailed hawks hunt primarily using their sense of _____.
7. American River Otters live throughout most of North America: (A) True (B) False
8. Florida Panthers have retractable: (A) Teeth (B) Tails (C) claws (D) Fur
9. Gopher Tortoises have a life span of approx. _____ years.
10. Kingsnakes are non-venomous; they kill their prey by _____.

Quiz #4

This is a take-home quiz. To answer the questions, some of which were covered in the film, use all available resources including books and the web. Answer all the questions in complete sentences.

1. *Tortoises belong to ancient family of reptiles. How long ago do scientists think that turtles and tortoises evolved?*
2. *The Florida Kingsnake is one of how many species of kingsnake that live in North America?*
3. *Why can kingsnakes hunt and eat venomous snakes?*
4. *In the wild, how long do American River Otter pups stay with their parents?*
5. *What is the conservation status of the American Crocodile?*
6. *How many cubs do Florida Panthers usually have and how long do they stay with their mothers?*
7. *List two ways in which the parenting strategies of Red-tailed Hawks and American Alligators differ?*
8. *Why can American Crocodiles live in salty or brackish waters when their alligator cousins are incapable of doing so?*
9. *Which of the following species evolved most recently: Gopher Tortoises, River Otters, American Crocodiles?*
10. *In what other county (countries) besides The United States is one likely to find Red-tailed Hawks?*

Quiz and Work Sheet Answers and Solutions

WORD SCRAMBLE SOLUTIONS:

- 1. Raptor**
 - 2. Venomous**
 - 3. Constrictor**
 - 4. Olfactory**
 - 5. Species**
 - 6. Reptile**
 - 7. Panther**
 - 8. Ecosystem**
 - 9. Predator**
- Riddle: Carnivore**

CONSERVATION WORK SHEET

The answers to this activity are more subjective. Teachers will need to create their own guide for this work sheet based on the needs and topics covered in class.

QUIZ #1

1.B 2.B 3.D 4.C 5.B 6.B 7.A 8.D 9.A 10.C

QUIZ #2

1.B 2.G 3.N 4.R 5.I 6.Q 7.S 8.F (9-12 can be in any order)...D, J, M, O 13. K 14.A 15.L

QUIZ #3

1.D 2.C 3.A 4.Meat/Fleash 5.Habitat 6.Sight 7.A. 8.C 9.60-80 years 10.Constriction

QUIZ #4

- 1. 200-215 million years ago**
- 2. Five**
- 3. Immune to venom of poisonous snakes**
- 4. 1-2 years**
- 5. Endangered**
- 6. 2-4/ 1 ½ - 2 years**
- 7. Red tails: incubate eggs w/ their bodies, both parents incubate eggs and feed chicks Alligators: build nests that keep eggs warm, father not involved in rearing offspring, young feed themselves upon hatching, alligators lay many more eggs than red tails**
- 8. Salt excreting gland in crocodile mouth, lacking in alligators**
- 9. River otters**
- 10. Canada, Mexico, Cuba, most countries in Central America**

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