All About Snakes

No pre-requisites

Materials Needed:
Herpetological Study Sites to visit
Live snakes
Snake handling tools: tongs, snake stick
Snake transportation containers: bags, boxes, and coolers
Snake enclosures for short-term care: plastic Rubbermaid type containers with appropriate husbandry accessories such as newspaper type bedding, water source, and food

Objectives:

Participant will . . .

- learn general and species-specific information about snakes including biology, natural history, natural behaviors and reptile conservation.
- visit study sites and learn about research and monitoring methods (ie. drift fences, mark and recapture, cover boards).
- be able to identify the venomous snakes found in North Carolina by sight.
- be able to identify the non-venomous snakes of North Carolina with the aid of a field guide.

Why learn and teach about snakes?

- Part of our mission in state parks to protect environment and teach others
- People have fear or attraction to snakes (attitude graphic)
- Fear of snakes is a taught behavior that hopefully we can change in some

Test knowledge: How many species of snake are there in NC?
List them in groupings: (small, medium, large, water, venomous)

Snake Biology - Reptiles (Snakes, Alligators, Lizards, Turtles)

- Lizards (moveable eyelids, ear openings) Snakes do not
  - Covered in scales that they usually shed several times a year
  - Teeth (pit vipers have hollow fangs, some have rear fangs, most have thin sharp teeth pointed towards rear of mouth)
  - Organs are usually staggered and in some species only one of the pair functions (cloaca)
  - Reproduction – male (hemipenes) – usually tucked inside the base of tail (males have longer tails than females and usually thicker)
    - Some female snakes can store sperm for months or even years
    - Many species have mating rituals (male-male combat)
    - Females release pheromones
    - Most mate in spring, some in fall, some at both times
    - Approx. ½ lay eggs and ½ have live babies mid-to-late summer & fall
    - Incubation ranges from a few days to 3 months

- Egg layers' babies have an egg tooth

- Senses
  - Hearing – no ear openings, has inner ear bone on jaw bone – feels vibrations
  - Taste/Smell – tongue gathers air particles and touches jacobson's organ
  - Sight – above ground snakes usually have enlarged eyes and good vision – burrowing snakes commonly have smaller eyes and can only discern shadows
  - Heat sensor – Pit vipers – pit between eye and nostril – can detect small changes
- Food
  - All snakes eat their prey whole
  - What they eat -Insects, spiders, earthworms, birds, rabbits, rodents, frogs, lizards, eggs, other snakes
    - Generalist – (racers, king snakes) – birds, mammals, reptiles, other snakes
    - Specialist – (hognose) - toads
  - How they catch it
    - Foragers / Vision hunters – racers, coachwhips
    - Sent hunters – rat snakes, king snakes
    - Ambush hunters – pit vipers (locate area by scent, ambush and then track sent)
  - How they hold on
    - Teeth – curved backwards
    - Constrictors (rat snakes, king snakes)
    - Venom – six inject venom; several others have venom in their saliva that enters the wounds and can paralyze or kill the prey
    - ex. (SE Crowned eats centipedes – rear fangs and venomous saliva)
  - When they eat
    - Many can go long periods without eating – days, weeks or even months
    - Some snakes go all winter without eating anything
- Defenses
  - Camouflage (almost all snakes)
  - Flee to safety (most snakes try this first)
  - Flatten body and head – make a triangular shaped head (rat snake, water snakes)
  - Musk (many when captured release this foul smell) E Diamondback can spray it
  - Lip curl to show "big teeth" – Red-bellied snake
  - Pine Snake – open mouth hissing
  - Cottonmouth – open mouth display
  - Mud, ringneck and coral snakes – put head in a hole and flash their bright underside (tail curl)
  - Hognose – most elaborate display
  - Biting – Usually as a last resort

- Locomotion
  - Lateral Undulation – contract long muscles on one side and then the other
  - Side winding – only two points touch the ground (racer crossing hot road)
  - Rectilinear Locomotion – both sides contract simultaneously
  - Racer – one of the fastest of the SE ~5mph
  - No snake can move over ground faster than the average person can run
- Activity
  - Ectotherms – Temperature drives this more than any other factor
  - They use their food for growth and reproduction, not maintaining body temp
  - Only require 1/10 the food of a similar size mammal
  - Hibernation/Brumation – Inactivity during cold months
  - Aestivation – Inactivity during hot months
  - Some are diurnal (racers), nocturnal (scarlet), both (corn, copperheads)

Snake ID
Focus first on positive identification of venomous snakes in your area. Do not attempt to capture these snakes.

Identification of non-venomous species.
Key Identification Traits:
- Scale type smooth or keeled
- Anal plate single or divided
- Body shape
- Pattern and color
- Distinctive characters
- Geographic location
- Habitat
- Time of day

Natural History and Behavior
Include interesting snake facts for general and species specific. Venom toxicity will be covered for venomous snakes. Snake behavior will be covered for many snakes. Other interesting facts will be covered as well. Natural history, conservation measures and habitats will also be covered.

Herpetological Conservation
Discuss current study taking place at the park. Visit the drift fence sites and cover board sites. Also talk about other monitoring and research methods (mark and recapture, cover boards, etc . . .). Conservation measures will be discussed. Species of Special Concern, Endangered will be covered (Southern hognose, Northern pine snake, Pigmy rattlesnake, Timber rattlesnake, Eastern diamondback, Eastern coral snake, and subspecies Carolina water snake, and Outer banks king snake).

Field Component
There is a definite field component to this workshop. Many of the topics will be covered out in the park including some of the natural history and behavior, habitats, alternative methods, and

herpetological studies. We will visit a drift fence and also multiple cover board sites. Students will also visit different habitats to see where the different snakes prefer and also look for them.

Resources:

A Field Guide to Reptiles & Amphibians of Eastern & Central North America (Peterson Field Guide Series) by Roger Conant, Joseph T. Collins, Isabelle Hunt Conant (Artist), and Tom R. Johnson (Artist)

Reptiles of North Carolina by William M. Palmer, Alvin L. Braswell, and Renaldo Kuhler (Hardcover - Sep 1995)

A Guide to the Snakes of North Carolina by Michael E. Dorcas (Paperback - May 20, 2005)

Snakes Of The Southeast (Wormsloe Foundation Nature Book) by Whit Gibbons, Michael E. Dorcas, and J. Whitfield Gibbons (Turtleback - May 23, 2005)

AIT: Category 1 (Natural and Cultural Resources)
EE Certification: Criteria II or criteria III