Louisiana Envirothon Training

Section 1: Mammal Skulls

Identifying Mammal Skulls

The first step to identifying an animal skull is to distinguish certain features generally referred to as Best Recognition Factors (BRF). BRF's of mammal skulls can help you identify which class (herbivore, carnivore, omnivore) and species of animal the skull belongs to…

Basic Parts of a Mammal Skull

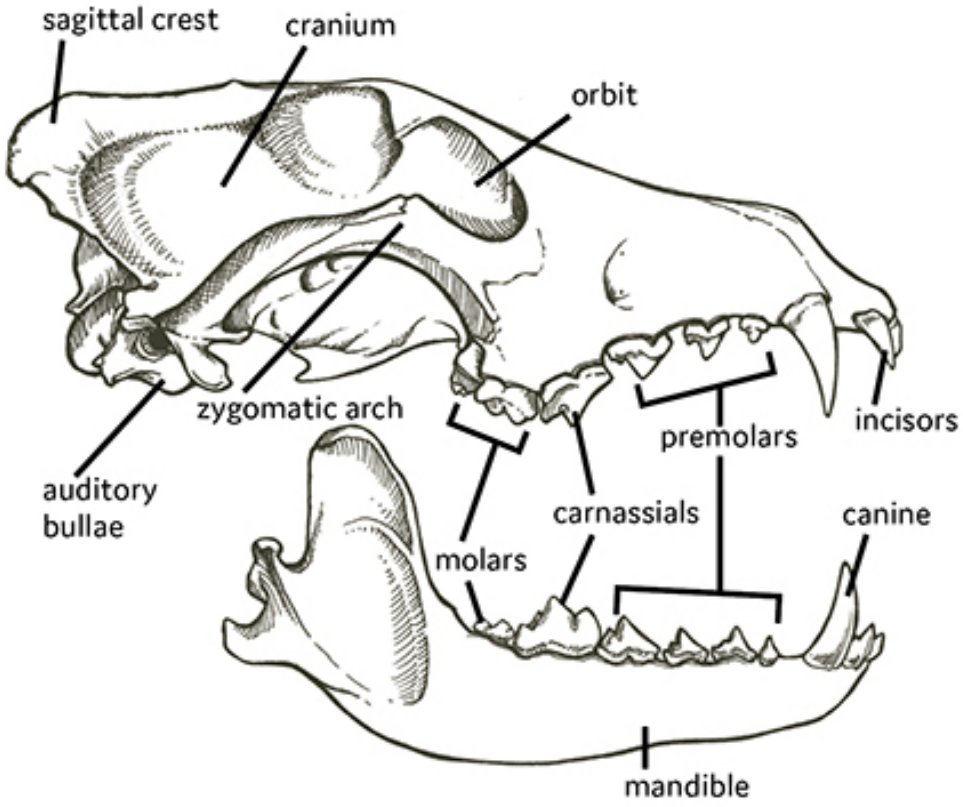


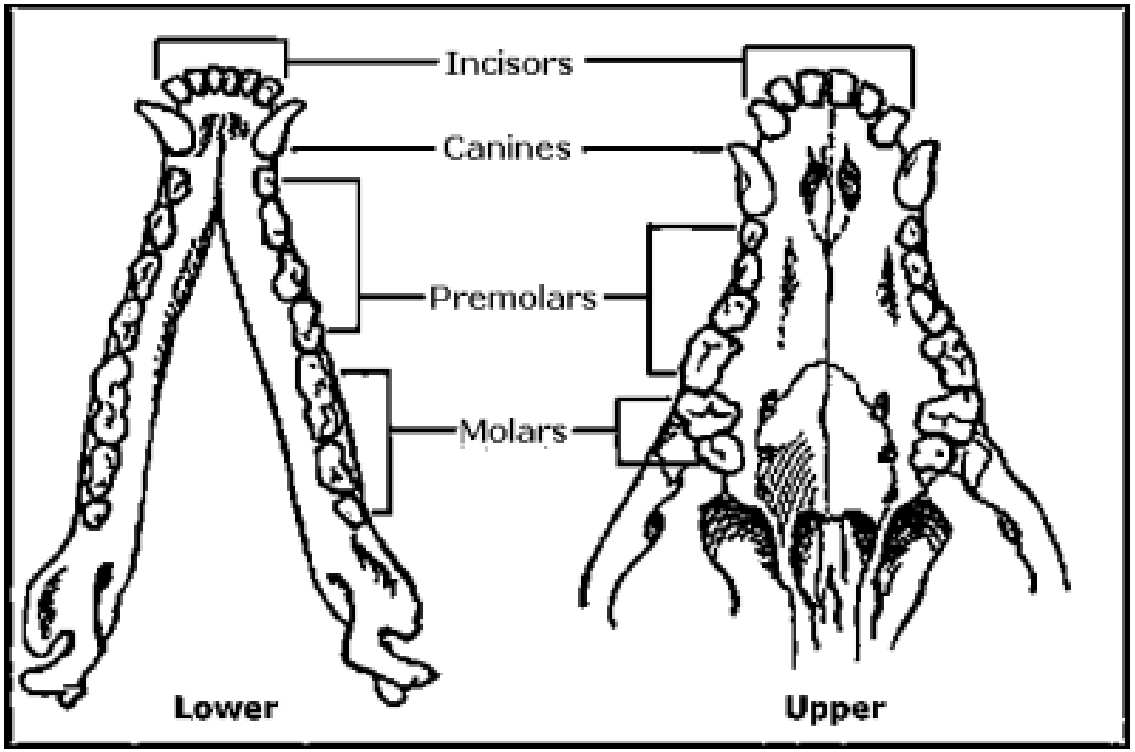
Photo from Alaska Department of Fish and Game

A good place to start is with the teeth of the skull…..

The types of teeth you see will help determine if the animal is a carnivore, an omnivore or an herbivore.

Mammal Teeth (4 main types)

Incisors: located at the front of the mouth with a sharp, flat biting surface; used for cutting, shearing, and pulling food
Canines: long, curved, and pointed; used for piercing and tearing food
Premolars: flat biting surface; may have a cusp along the edge; used for tearing and crushing food
Molars: flat biting surface; may have cusps at the edges; used for chewing, crushing, and grinding food



www.nps.com

Mammal Teeth

Carnivores: primarily meat eaters

- Teeth are designed for cutting, tearing, and piercing
- Small incisors
- Large, sharp canines
- Premolars and molars are used for shearing and will have sharp cusps

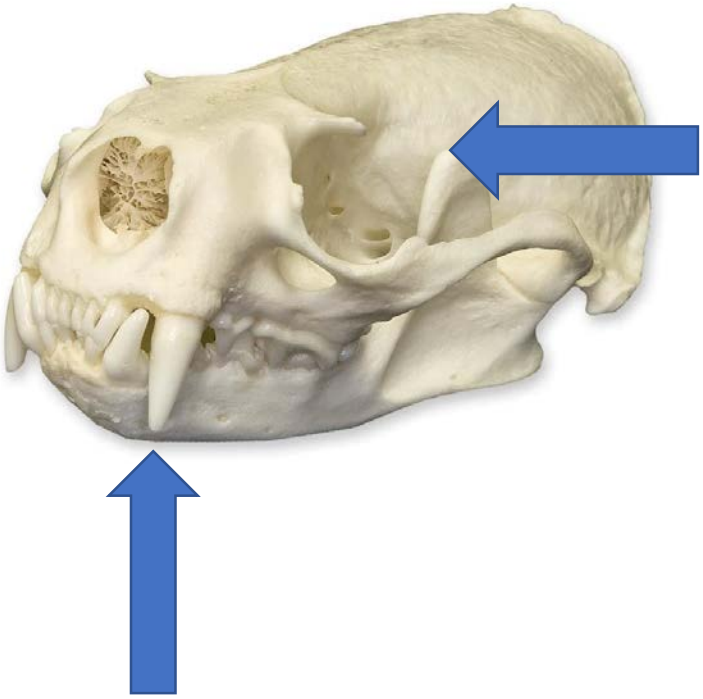
Herbivores: primarily plant eaters

- Teeth are designed for breaking down tough plant foods
- Wide incisors are used for stripping or cropping vegetative matter
- Canines are small or absent
- Premolars and molars of grazers are very flat
- Premolars and molars of browsing animals have low, sharp cusps

Omnivores: eat both meat and plants

- Combination of herbivore and carnivore teeth
- Long, sharp canines, but not as long as carnivores
- Premolars have sharp cusps
- Molars are usually squared off and bumpy

Carnivores tend to have long canines which are used to rip and tear meat, sometimes in a scissors like action. In addition, carnivores have sharp molars toward the back of the mouth, used to further rip and shred meat. Carnivores tend to have binocular vision, where their eyes are at the front of the head, which results in a smaller field of view, but allows for depth perception, needed to catch prey. Examples of carnivores include otters and bobcats.



River Otter Skull

Text Taken From: https://www.chesco.org/DocumentCenter/View/47500/2019-What-Can-I-Learn-From-a-Skull?bidId=

Photo From Skulls Unlimited

Herbivores tend to have well-developed flat premolars and molars, often with sharp ridges on the tops. Generally herbivores do not have canine teeth, and their incisors are usually large and used to snip off foliage from branches. Because herbivores are often prey for other animals, they generally have their eyes on the side of their head, which functions to give them a wider field of view, so that they can detect their prey earlier, and have a chance to flee. Examples of herbivores include rabbits beaver, nutria, muskrat, and white-tailed deer.

White-tailed deer Skull

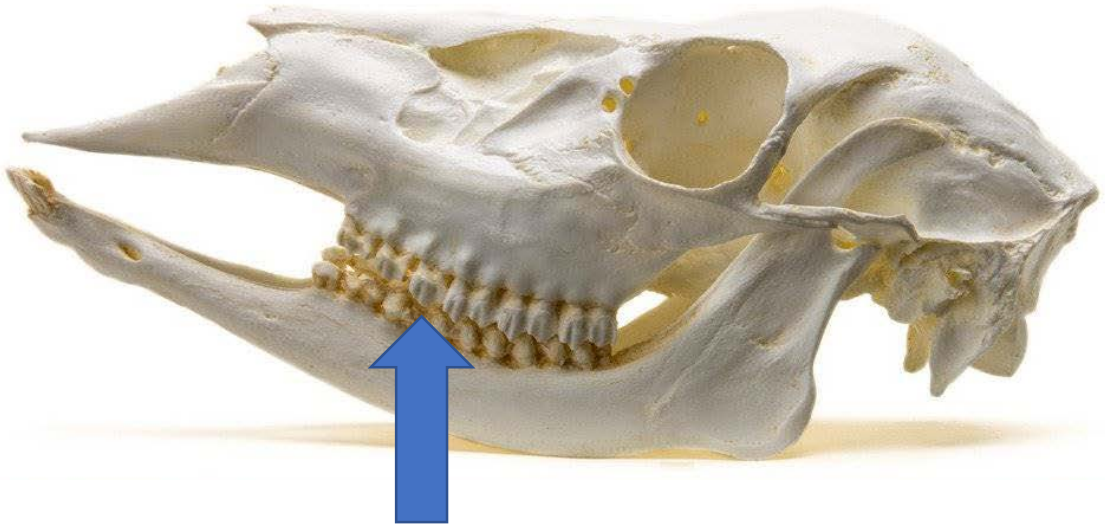


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Photo From Acorn Naturalists

Omnivores usually have a variety of all kinds of teeth. Generally omnivores have eyes on the front of their heads like carnivores, in order to best catch their prey. Examples of herbivores include black bear, raccoons, coyote, fox and opossums.

Virginia Opossum Skull

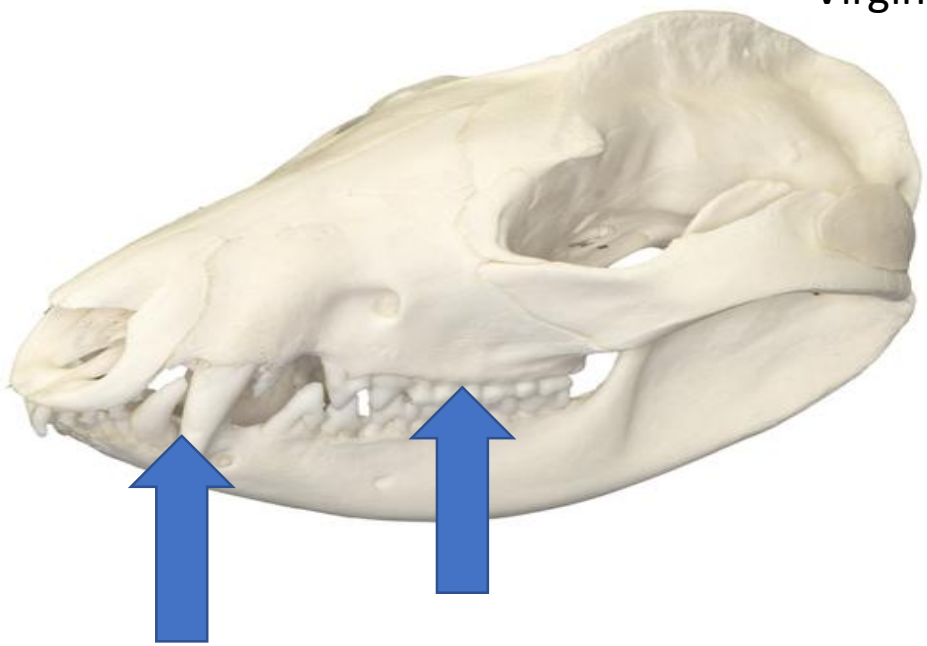

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Photo From Skulls Unlimited

Mammal Nose and Eye Features Can Also Help To Identify Skull Species

The Rostrum: nasal area

- Size is **related to importance of smell**
- **Herbivores generally have long noses**
- Noses of omnivores and carnivores vary

Eyes in the front, the animal hunts. Eyes on the side, the animal hides.

Orbit: part of skull surrounding the eyeball

- **Carnivores have large forward facing orbits allowing for binocular vision and depth perception**
- **Herbivores have eyes on the side allowing sight in all directions (almost 180 degrees of vision per side)**
- **Grazers (eat low lying vegetation) tend to have eyes high on the head to see above grass (ex. Cows)**
- Browsers (eat high growing plants) have eyes far back on the skull to avoid twigs and preserve vision when their noses are in brush (ex. Deer)
- Omnivores tend to have orbits facing partially forward giving maintaining a wide field of view and decent depth perception
- **Animals that spend time in the water tend to have orbits high on the skull to the eyes above water**
- **Nocturnal animals tend to have large eyes and orbits for increased night vision**

The Skulls Of Louisiana Mammals You Are Learning To Recognize Are:

- Louisiana Black Bear
- Feral Hog
- Fox-Gray and Red
- Coyote
- Bobcat
- (Virginia) Opossum
- (American) Beaver
- Nutria
- Muskrat
- (American) River Otter
- (American) Mink
- Raccoon
- (Nine banded) Armadillo

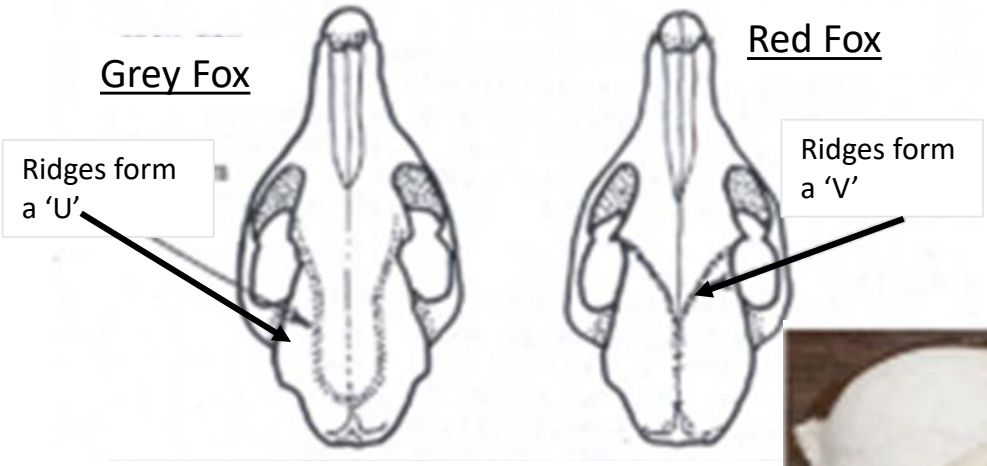
Louisiana Black Bear Skull

Photo from Skulls Unlimited

Feral Hog Skull

Photo from Skulls Unlimited

Red Fox and Gray Fox



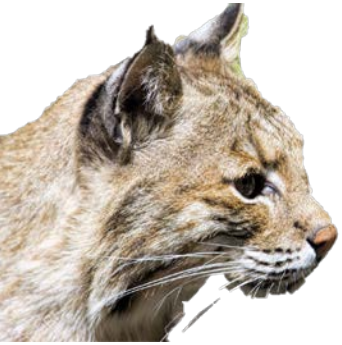
Red Fox

Gray Fox

Coyote: shown for reference

Coyote Skull

Photo from Skulls Unlimited



Bobcat Skull

Photo from Skulls Unlimited

Virginia Opossum Skull

Photo from Skulls Unlimited

American Beaver Skull

Photo from Skulls Unlimited

Nutria Skull

Photo from Skulls Unlimited

Muskrat Skull

Photo from Skulls Unlimited

American River Otter Skull

Photo from Skulls Unlimited

American Mink Skull

Photo from Skulls Unlimited

Raccoon Skull

Photo from Skulls Unlimited

Nine Banded Armadillo Skull

Photo from Skulls Unlimited

Whitetail Deer

Photo from Skulls Unlimited

Age Determination of Whitetail Deer

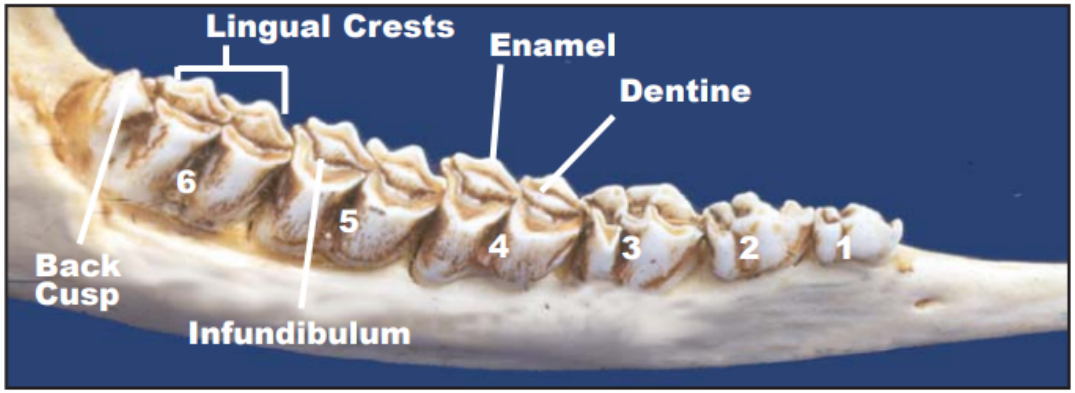
- Tooth wear and replacement is one of several methods for aging whitetail deer.
- Deer are aged by examining the wear and replacement of the premolars and molars of the lower jaw.
- As a deer grows older, its teeth continue to wear.
- As the enamel begins to wear away, and exposes the dark dentine material, noticeable distinctions in tooth wear occur between each age class.
- Deer are aged in year and half increments, such as 1 1/2, 2 1/2, 3 1 /2, etc., since fawns are born from late May through July, those harvested during their first year are recorded as 6 months.

Taken from *A Guide to Age Determination of White-tailed Deer,* Texas Parks and Wildlife

Whitetail Deer

Deer Teeth Parts

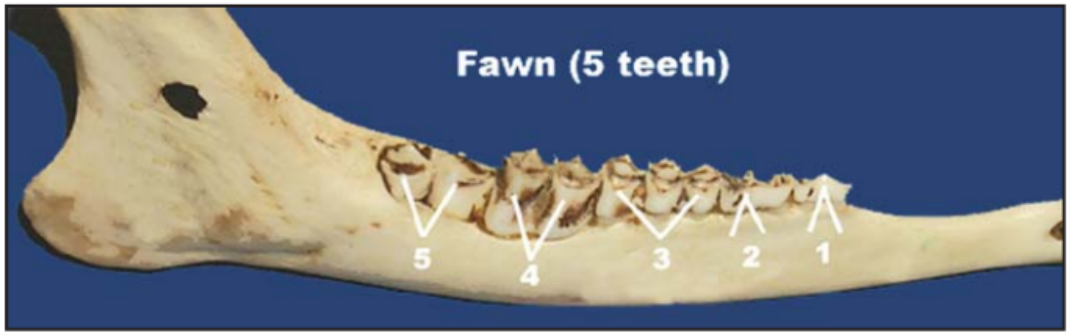
Cusp: a point or projection on a tooth
Back Cusp: very last cusp on tooth 6 on cheek-side of the jaw
Lingual Crest: tooth ridge adjacent to the tongue
Enamel: hard, white, outer coating of a tooth
Dentine: soft inner core of a tooth, dark brown color
Infundibulum: crescent-shaped depression in the central crown of a tooth between the enamel ridge or crest



Whitetail Deer

Fawn (1/2 year)

Aging fawns should not be difficult. For more clarification, inspection of the lower jaw will indicate age. Fawns have 5 or less teeth present and the third premolar (tooth 3) has 3 cusps. Tooth 6 has not yet erupted. In younger fawns tooth 5 has not erupted and only 4 teeth will be visible.



Whitetail Deer

1 1/2 years

Tooth 3 (3rd premolar) has 3 cusps. Tooth 6 has erupted and is slightly visible just above the gum line.

Whitetail Deer

2 1/2 years

Lingual crest on all molars are sharp and pointed. Tooth 3 now has 2 cusps. Back cusp of tooth 6 is sharp and pointed. Enamel is wider than the dentine in tooth 4, 5 and 6.

Whitetail Deer

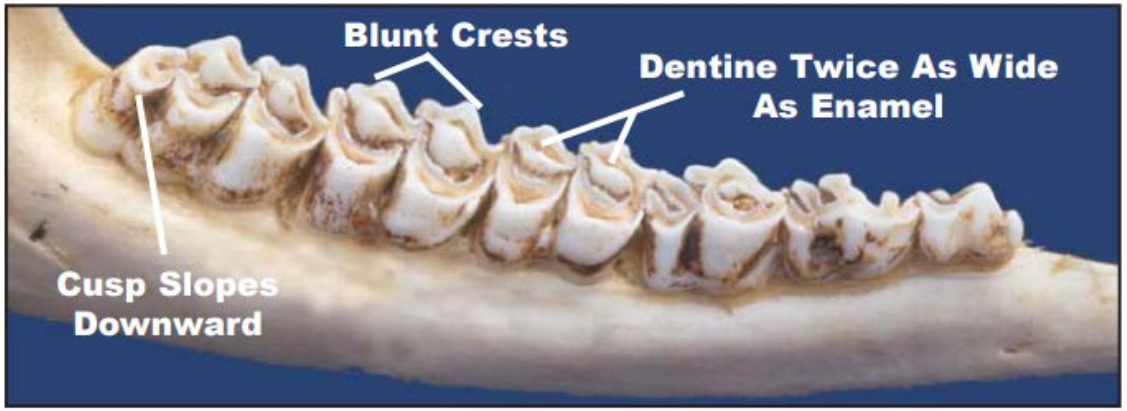
3 1/2 years

Lingual crest on tooth 4 is blunt. The dentine is as wide or wider than the enamel in tooth 4. The back cusp on tooth 6 is forming a concavity.

Whitetail Deer

4 1/2 years

Lingual crest on tooth 4 are almost rounded off and lingual crest in tooth 5 are blunt. The dentine in tooth 4 is twice as wide as the enamel. The dentine in tooth 5 is wider than the enamel. The back cusp on tooth 6 is worn so badly that it slopes downward towards the cheek.



Whitetail Deer

- Biologists, landowners or land managers may be interested in deer ages from a deer management standpoint.
- Age data provides information about deer herd characteristics, hunting or mortality pressure on a particular age class, and progress of the wildlife management program.
- Age data becomes a valuable piece of information when used with other data such as antler characteristics, dressed body weights or lactation in females.
- Deer herd trends can thus be monitored if enough data are collected over time.
- Often these trends can be related to a particular management style, climatic conditions or any other factors affecting deer.

Information from Slides 27-34 taken from *A Guide to Age Determination of White-tailed Deer,* Texas Parks and Wildlife

Louisiana Furbearer Pelts

Louisiana Furbearers

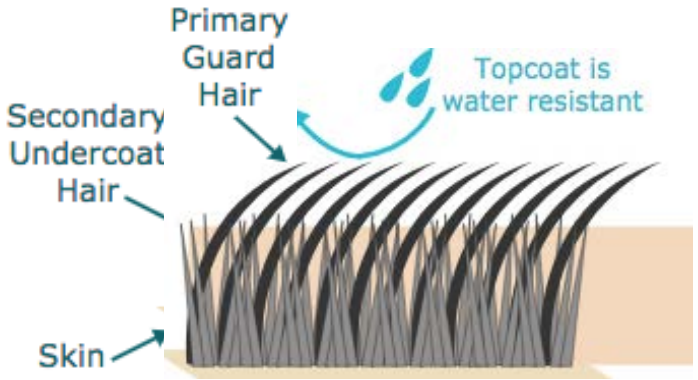
Furbearer: an animal whose fur is valued commercially

The full coat of fur is made up of:

- **Down hairs (underfur):** short, dense hair used for thermoregulation
- **Awn hairs:** distal part of the hair is coarser and straight and can shed water; the proximal section is thinner and wavy and acts as a thermoregulatory. This type of hair often forms the bulk of the coat.
- **Guard hairs:** long, coarse, straight hairs. Outer layer with the most pigmentation and gloss. Protects the underfur and sheds water.

Louisiana has 12 furbearing species.

11 are native and 1 is invasive (Nutria)



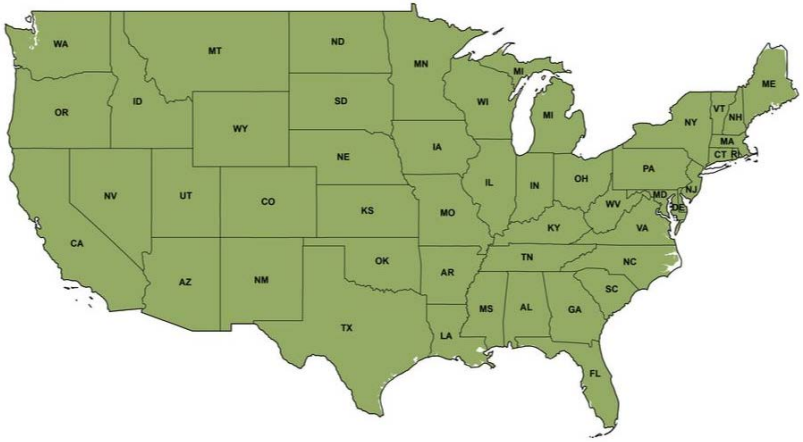
Bobcat

Bobcats live in a vast variety of habitat types, including heavily forested areas, swamps, bottomland hardwoods, and even deserts.

2”

Males weigh 20 to 22 pounds; females weigh 18 to 19.

Coyote

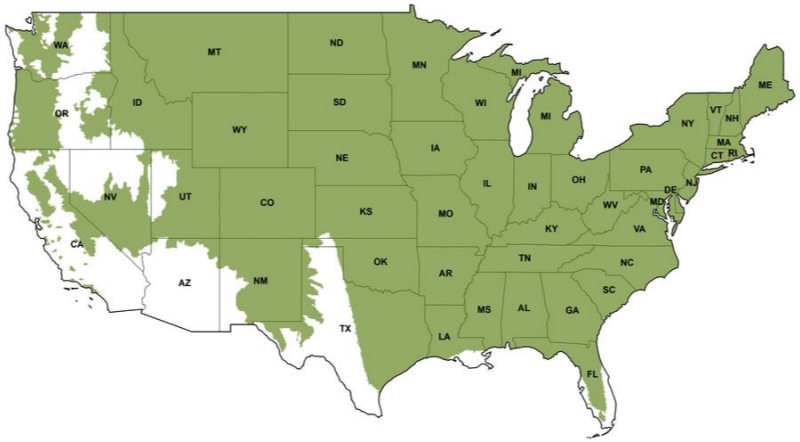


Coyotes live in a vast variety of habitat types, including forested areas, farmlands, prairies swamps, mountains, and deserts.

H-2 ¼”-F 2 ½”

Males average 30 pounds; females 25. Coat color varies, but generally mottled gray with a lighter belly.

Red Fox

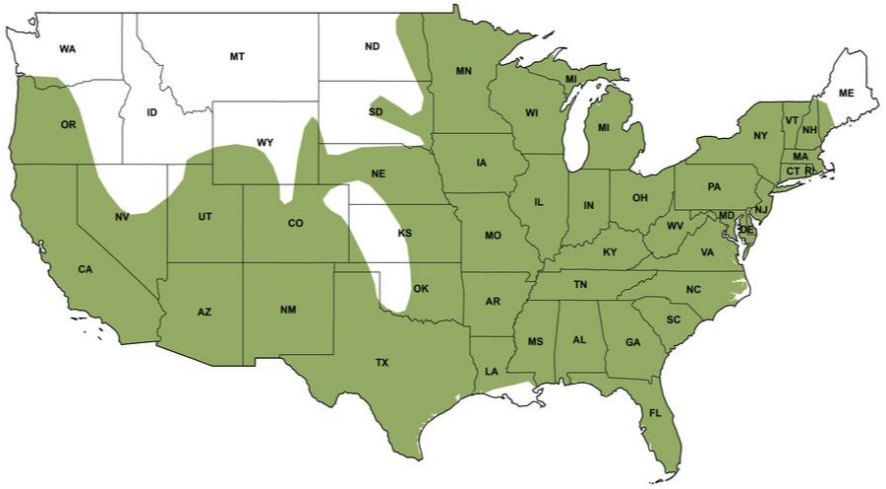


Red foxes live in mixed wooded areas with ungrazed pastures, rice fields, and cane fields.

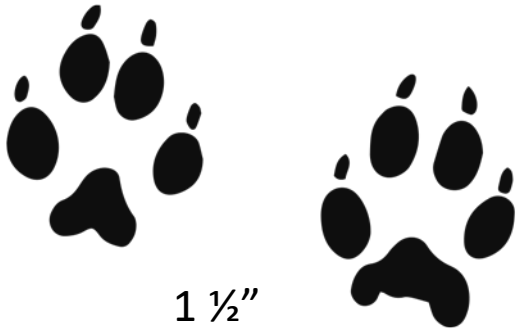
1 ½” to 2 ¼”

Adult weight is 8-14 pounds and the total length is 3-4 feet (12-17 inches of which is tail). They have yellow eyes with elliptical pupils.

Gray Fox



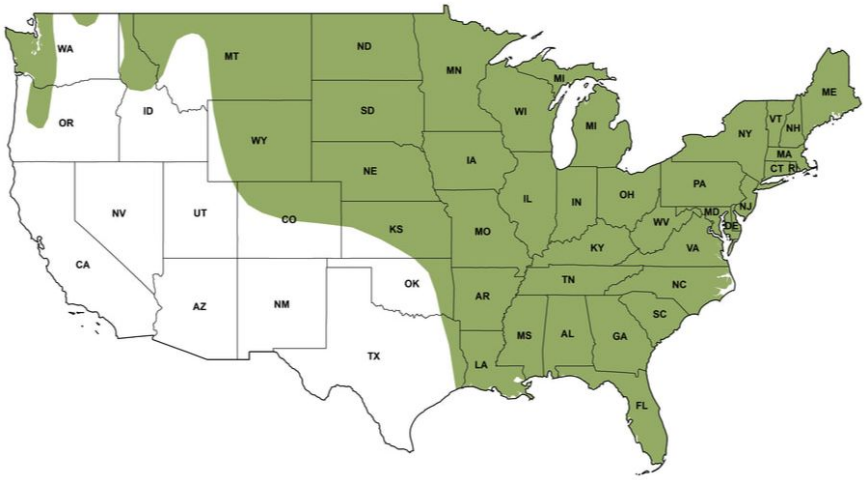
Gray foxes live in forests, deserts with brushy vegetation, and swampy areas (they do not mind getting their feet wet). They avoid grasslands and prairies.



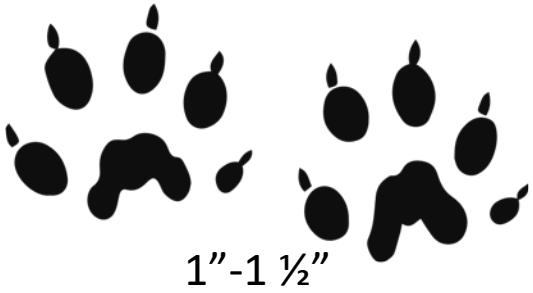
1 ½”

Adult weight is 8-11 pounds and they are shorter and stockier than red foxes. They have dark eyes with elliptical pupils.

Mink



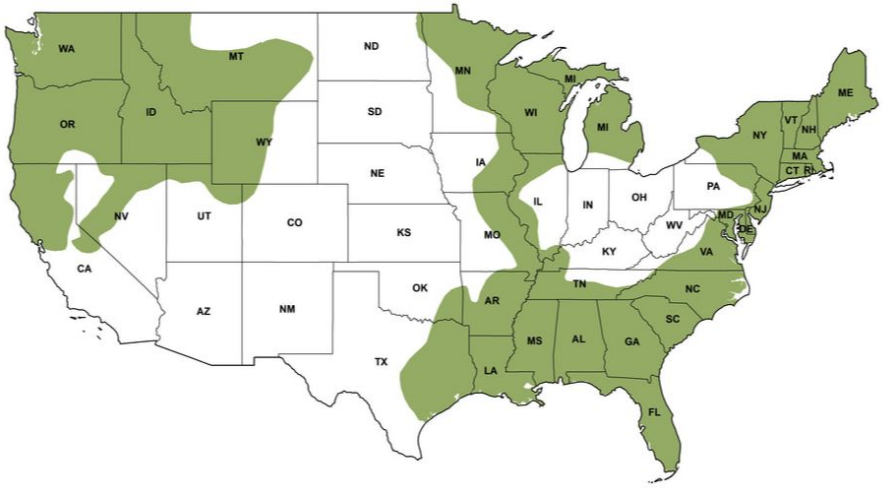
Mink live along ponds, canals, rivers, streams, lakes and marshes.



1”-1 ½”

Males can be 20 to 30 inches and weigh over three pounds; females are 1 ½ to 2 pounds and 16 to 21 inches.

North American River Otter

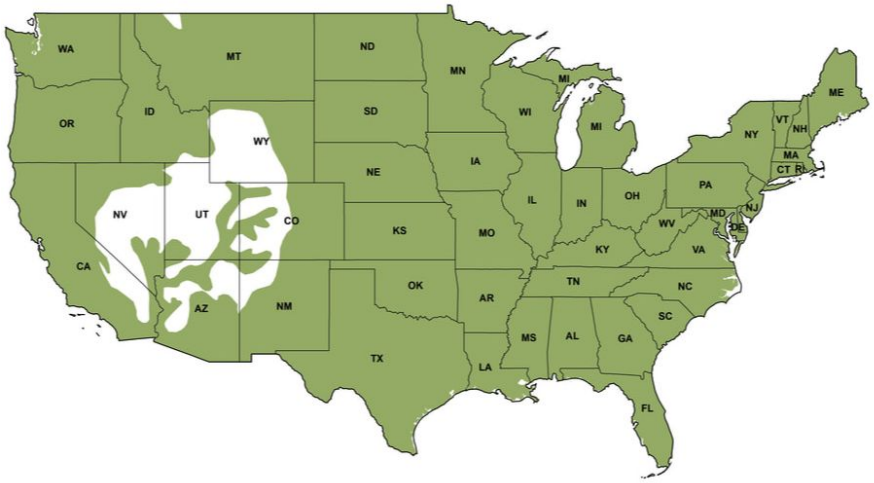


Otters live near streams, lakes and marshes. They prefer isolated habitats.

2”-3”

Males can weigh up to 25 pounds; females generally weigh under 20.

North American Raccoon

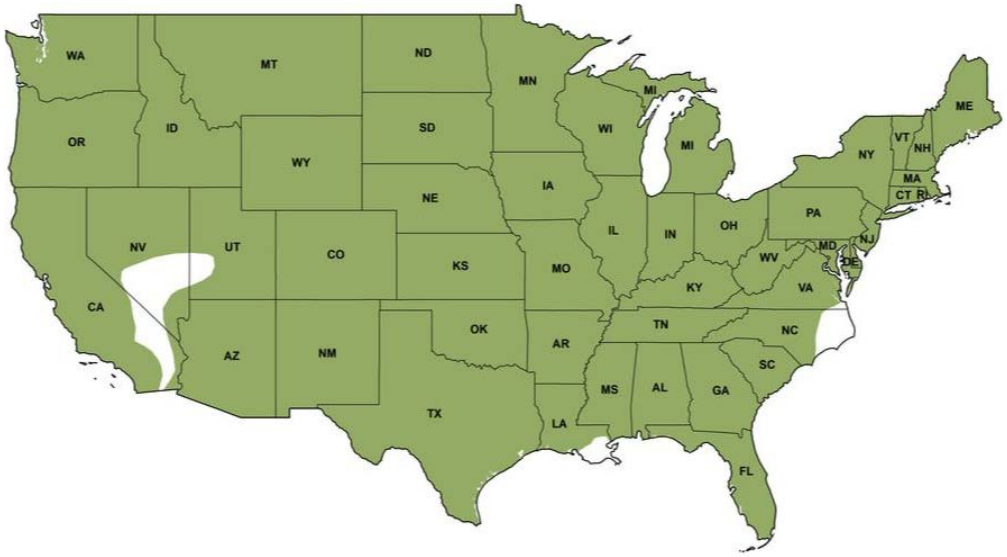


Raccoons hunt in and around water, but they can roam far from water. They can often be found living in urban habitats.

H-4”-F 2 ½”

The hind legs are longer than the front legs so that they have a hunched posture.

Striped Skunk

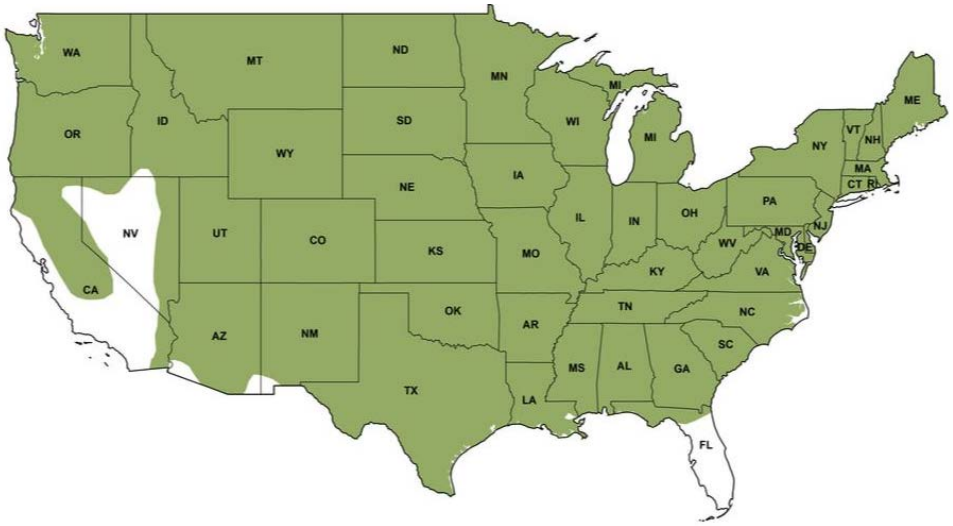


Striped skunks prefer a mixture of woodlands and farmlands.

H-2”-F 2”

Skunks can spray their musk repeatedly when they feel threatened.

North American Beaver

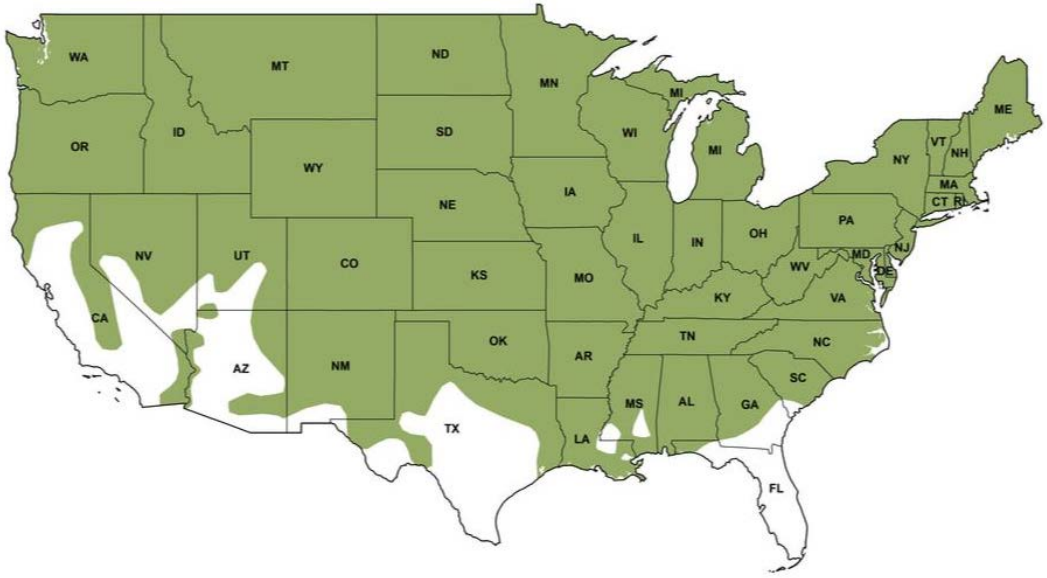


Beavers live near wooded rivers, streams, lakes, swamps, and backwaters.

H-6”-F 3”

Beavers have a humped back with a wide flat tail and webbed feet. The average weight is 33 pounds.

Muskrat

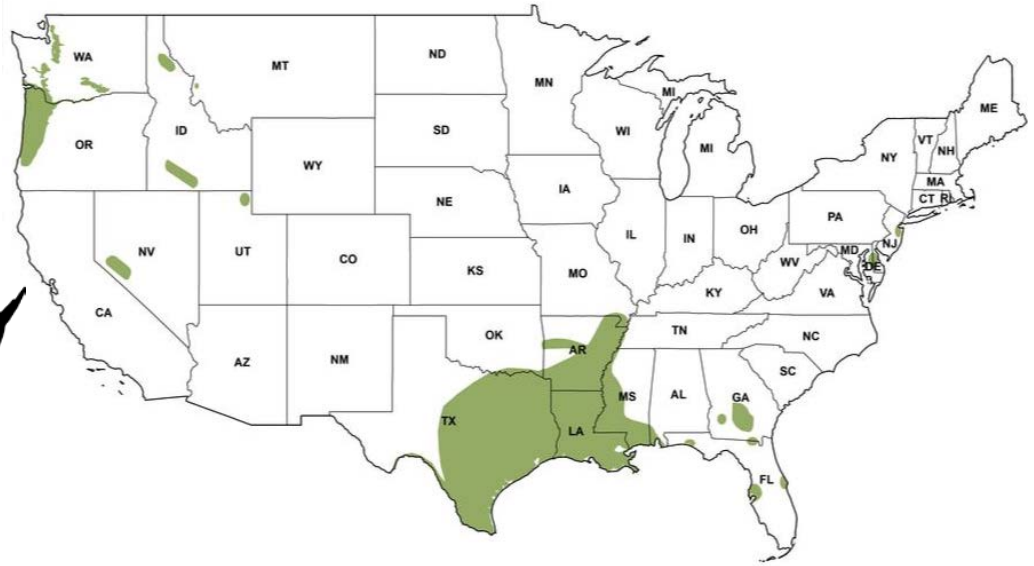


Muskrats live in coastal marshes, bayous, lakes.

H-2 ½”-F 1 ½”

Muskrats build houses out of vegetation and mud and burrow into levees and stream banks to construct dens.

Nutria



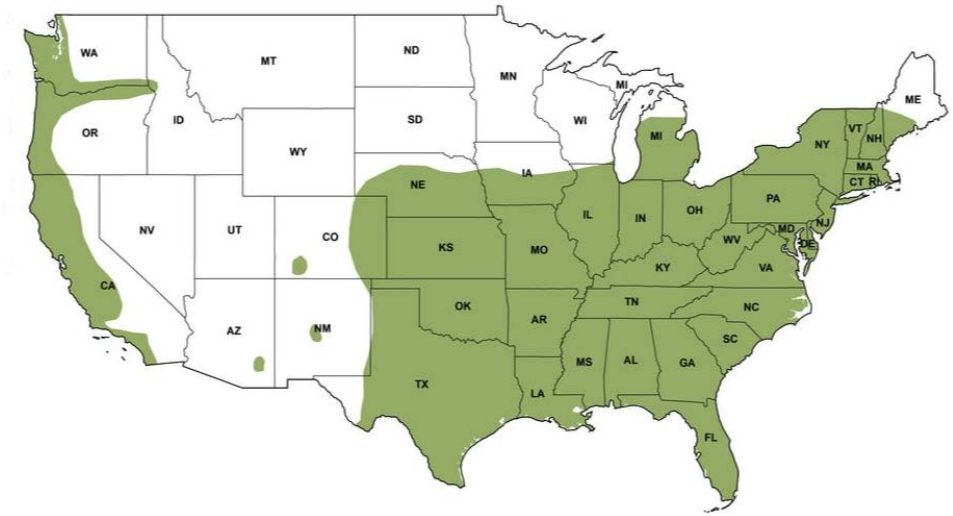
F 2 ¼”-H 3”

Nutrias live in swamps, marshes, rivers, lakes, streams, back waters.

Nutria are a <u>non-native</u> furbearer. They were imported from South America. <u>They are considered an invasive species</u>.

Nutria have mammary glands on the sides so that infants can nurse while the mother swims.

Virginia Opossum

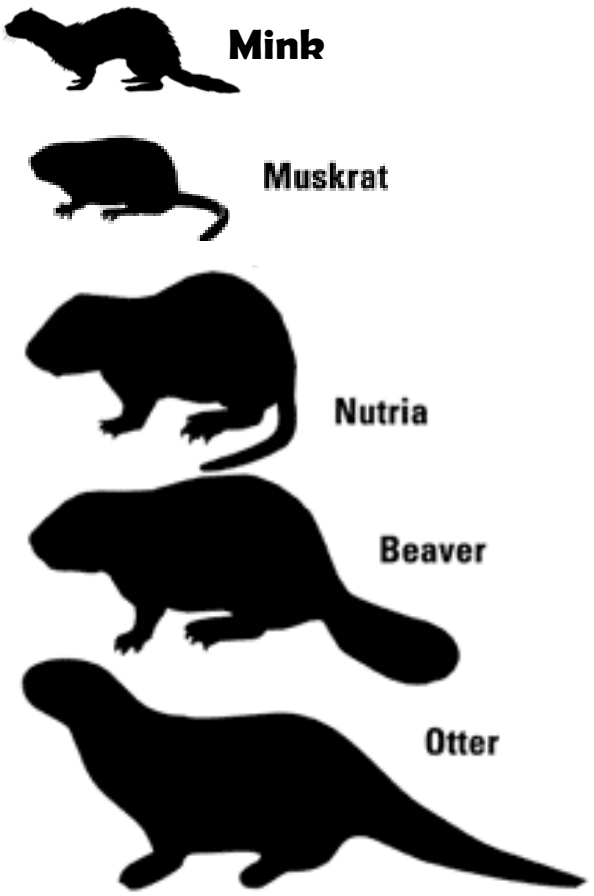


Opossums adapt to a variety of habitats: farmlands, prairies, swamps, and forests

H-2”-F 1 ¼”

Opossums have more teeth than any other mammals. They are the only marsupial in North America.

Size and Shape comparison of water mammals



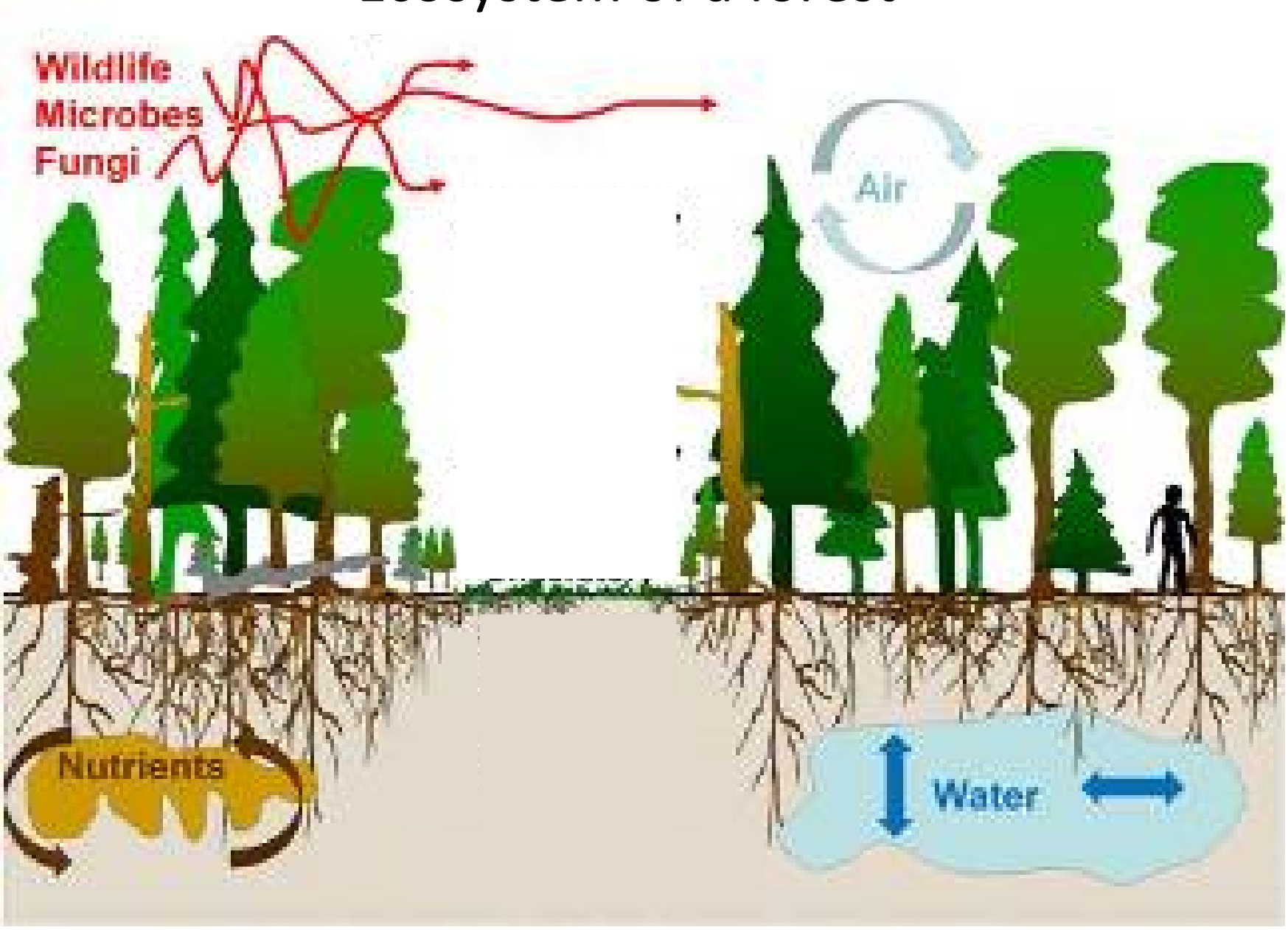
Otter Mink Beaver Nutria Muskrat

Section 2: General Biology

Definitions

- Environment – a physical location in time and space, small or large, stable or temporary including both the physical conditions (Abiotic) and organisms (Biotic)
- Abiotic – non-living components of an ecosystem (weather, soil, water)
- Biotic – living components of an ecosystem (animals, plants, fungi)
- Ecosystem – Biotic and abiotic components of an environment functioning together as a system

Ecosystem of a forest



Definitions

- Habitat: the place where a particular plant or animal is naturally found.
- The animals physical needs determine where a species will exist. Habitats provide energy (in the form of food and water) and shelter
  - Examples of habitat factors can include: Vegetation type, weather, amount/type of water present, food & prey/predator availability. Successful reproduction
- Animals are designed for or adapted to the habitats where they live. That is, they have developed bodies and behaviors to help them survive in their environment. Adaptations help animals get food, protect themselves, and reproduce.

<u>Adaptations</u> genetically determined characteristics of an animal that help it to survive in its environment. These characteristics fall into three main categories: body parts, body coverings, and behaviors. Any or all of these types of adaptations play a critical role in the survival of an animal.

Examples of animal adaptations include:

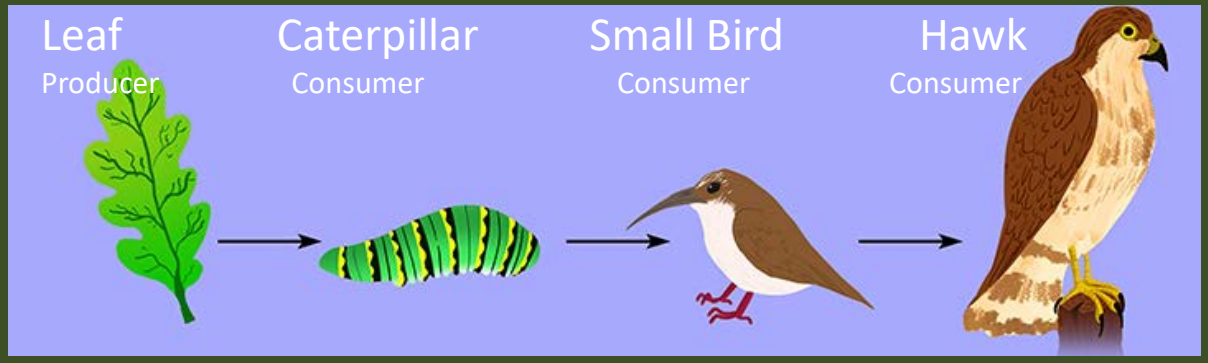
- **the long necks of giraffes for feeding in the tops of trees**
- **the streamlined bodies of aquatic fish and mammals**
- **the light bones of flying birds and mammals**
- **and the long dagger-like canine teeth of carnivores**

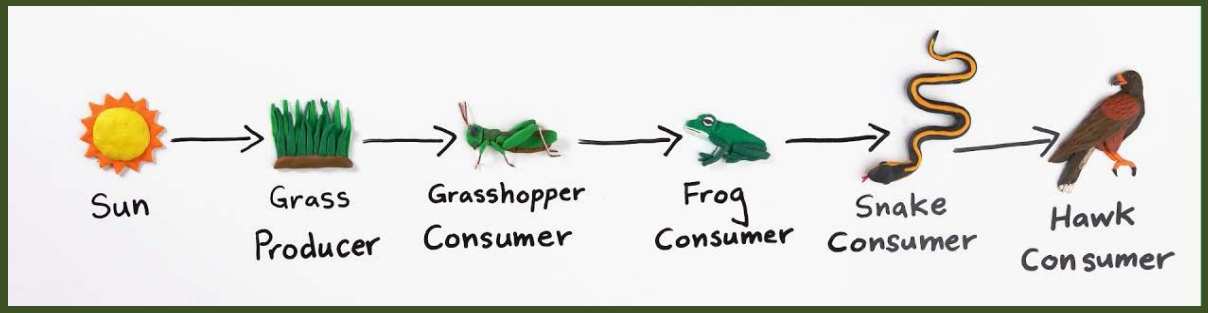
Some Bat Adaptations

- **Light bones for flying**
- **Big ears for Eco locating**
- **Specialized mouth for capturing prey**

Food Chains and Food Webs

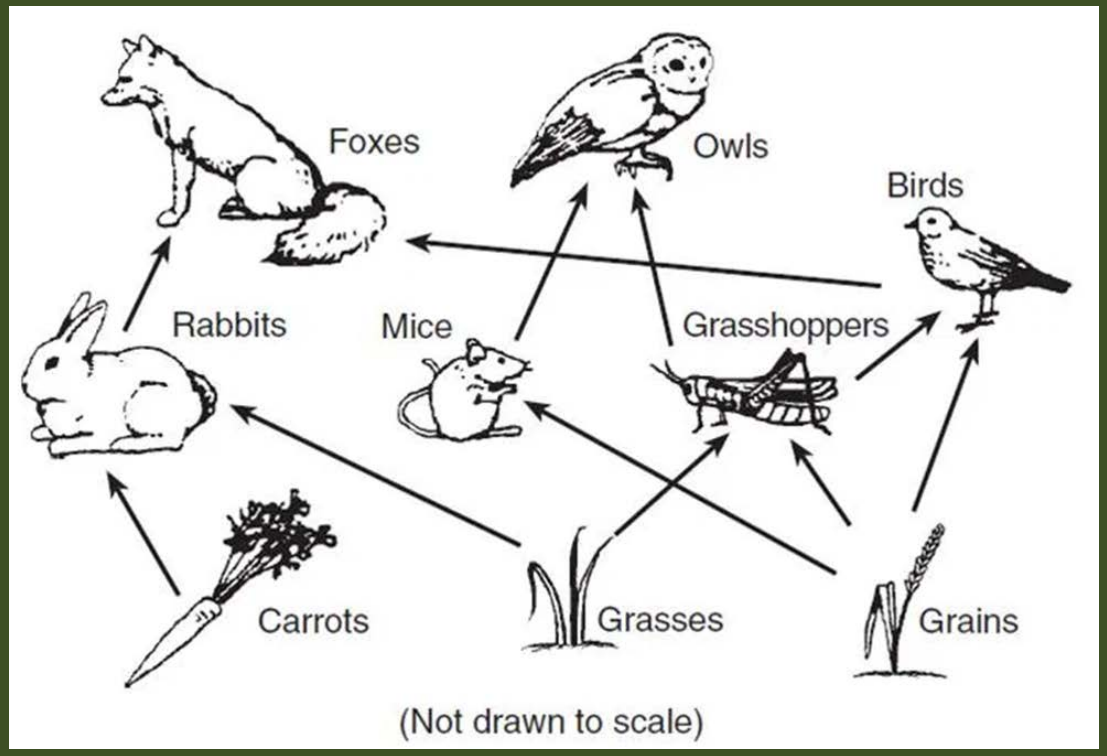
A food chain is a possible path that energy and nutrients may take as they move through the ecosystem. All food chains start with a producer (a plant), which is eventually eaten by a consumer.





Food Chains and Food Webs

A food web consists of **all the food chains in a single ecosystem**. All of the interconnected and overlapping food chains in an ecosystem make up a food web.



Section 3: Biodiversity and Endangered Species

Biodiversity is the variety of different types of life found on earth. It is a measure of the variety of organisms present in different ecosystems.

The more plant, insect, and animal species there are in one area the greater the biodiversity and generally the healthier the ecosystem.

All living creatures need other creatures and plants in one way or another even if the connection is not so clear.

Therefore the removal of a single species can conceivably set off a chain reaction affecting many others.

Due to this fact, a law was created to help prevent the loss of any species of animal or the habitat they live in the United States.

The Endangered Species Act of 1973

The Endangered Species Act of 1973

The Endangered Species Act (ESA) provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The United States Fish and Wildlife (USFWS) enforces regulations pertaining to this act.

Red cockaded woodpecker and long leaf pine habitat
USFWS Photos

Key Definitions

Endangered: Any species in danger of extinction throughout all or a significant portion of its range.

Threatened: Any species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Conserve: Use of all methods and procedures necessary to bring any endangered or threatened species to the point at which the measures provided under the Act are no longer necessary.

Keystone species: A species on which other species in an ecosystem largely depend, such that if it were removed the ecosystem would change drastically.

Examples include: sharks, grizzly bears, wolves, sea otters, prairie dogs and snowshoe hares

Western Indian Manatee

USFWS photo

What Causes Animals to Become Endangered?

- **Loss of Habitat – The most significant causes of endangered animals is habitat loss**

- **Invasive Species – Introduced species generally outcompete native species for resources**

- **Overexploitation of Resources - Human actions that directly cause a decline in a species population (ex: overfishing, historical collection of species)**

- **Pathogens and Disease - native populations have little resistance to the invading pathogen introduced into their environment by invasive species or humans.**

- **Environmental Pollution – addition of pollutions and toxins into a habitat that negatively affect a species (ex: pesticides including DDT)**

Photo of habitat loss from Wikipedia

Section 3: Endangered Species in Louisiana

Whooping Crane

Whooping Cranes are one of the worlds most endangered crane species with an estimated 700 individuals in the world.

They only occur naturally in North America. Louisiana began a project in 2011 attempting to reestablish a population of whooping cranes in Louisiana. As of October 2021, the state has 71 cranes.

They historically utilized the Cajun Prairie grasslands, however, now they most commonly occur in rice and crawfish fields.

One of the biggest issues LA's current Whooping Crane population faces is awareness and proper identification. Residents struggle to identify the crane when compared to other egret species we have in the state.

Several Species of Birds Resemble Whooping Cranes

The *Snow Goose* is the ONLY species that can be shot during hunting season.

KNOW YOUR TARGET BEFORE YOU SHOOT!

Size comparison


Whooping Crane is
North America's Tallest Bird
Height: 5 feet
Weight: 5-7 kg (11-17 lbs)
Wingspan: ~7-8 ft

A few of Louisiana's other Endangered Species include:

- Red Cockaded Woodpecker
- Western Manatee
- All sea turtle species
- Louisiana Pine Snake
- Abbeville Red Iris
- Gulf Sturgeon

The complete list can be found at here and here

The Success Stories

Louisiana has been successful in recovering several species that were once considered threatened or endangered. These animals are more numerous now.

Examples of Louisiana success stories include: the Brown Pelican, the Louisiana Black Bear, the Bald Eagle and the American Alligator.

Photo by Heather Williams

Section 4: Invasive Species in Louisiana

Key Definitions

Invasive species is an introduced organism that becomes overpopulated and negatively alters its new environment.

Examples of terrestrial invasive species in Louisiana are:

Feral hog
Imported Red fire ant
Asian tiger mosquito
Nutria

Why Are Invasive Species Bad?

Invasive species are harmful in Louisiana because they may:

- Spread rapidly due to a lack of natural predators
- Feed on native species and reduce native population sizes
- Outcompete native species for food and habitat resources
- Introduce new parasites and pathogens

A species is considered invasive when:

1. It is introduced into a new area, outside of its native range
2. Its presence disrupts native food webs

Louisiana's sub-tropical climate provides suitable habitat for invasive species from all over the world. Stopping the spread of aquatic invasive species is extremely difficult, especially in Louisiana with our interconnected waterways. LDWF needs your help to locate invasive species and to prevent new invasive species from becoming established.

A waterbody plagued by Silver Carp.

Nerissa Michaels/AP/Illinois River Biological Station via Houma Today.com

How Can You Help?

Information about the location of various invasive species is an important tool in helping biologists combat spreading. Fortunately, you can help by taking the following actions:

If you see/catch any of these species:

- Record date and location (GPS coordinates preferred)
- If caught, place organism in a labeled bag and freeze
- Contact LDWF at 225-765-0765

Other ways to help:

- Never release aquarium pets purchased from pet stores into the wild. Contact LDWF for proper disposal of unwanted pets.
- Never empty live fish, bait, or water from a bait well from one body of water into another.

Invest in the Future...Geaux Fish Louisiana!

This public document was published at a total cost of $_____. _____ copies of this public document were published and partially paid for by an Aquatic Invasive Species Grant from the U.S. Fish and Wildlife Service in this first printing at a cost of $_____. This document was published by the Louisiana Department of Wildlife and Fisheries, 2000 Quail Drive, Baton Rouge, LA 70808, to inform Louisiana residents and non-residents about the impacts of aquatic invasive species. This material was printed in accordance with standards for printing by state agencies.

BEWARE

Saltwater

Asian Tiger Prawn
(Penaeus monodon)

- Dark color with white and yellow stripes
- Occasionally have red line extending length of body
- Larger than and competes with native shrimp

Lionfish
(Pterois spp.)

- Red, white, and brown stripes with elongated dorsal and pectoral fins
- Found on reef structures and hard bottoms
- Venomous spines
- Aggressive predator that competes with and feeds on native reef organisms

Freshwater

Northern Snakehead
(Channa argus)

- Brown with dark blotches, long dorsal and anal fins, flattened head
- Aggressive predator
- Often confused with the native bowfin

Rio Grande Cichlid
(Herichthys cyanoguttatum)

- Dark color, white and blue spots
- Large forehead
- Territorial
- Competes with and often confused with native panfish

Apple Snail
(Pomacea spp.)

- Brown, black, or yellow banded shell
- Large, up to 10 cm
- Attach pink or orange egg clusters to vegetation or structures above water line
- Feeds on aquatic vegetation
- May carry parasites that infect humans

Silver Carp
(Hypophthalmichthys molitrix)

- Leaps out of water and injure boaters
- Competes with native filter feeding fish & shellfish

Bighead Carp
(Hypophthalmichthys nobilis)

- Competes with native filter feeding fish & shellfish

Common Carp
(Cyprinus carpio)

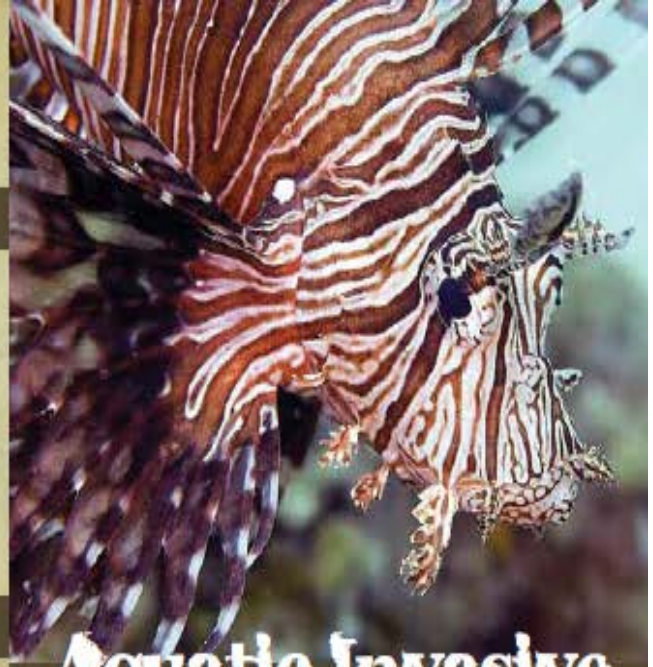
- Disturbs bottom sediments and uproots native aquatic vegetation when feeding

Black Carp
(Mylopharyngodon piceus)

- Threatens populations of native snails and mussels

Grass Carp
(Ctenopharyngodon idella)

- Disturbs bottom sediments and uproots native aquatic vegetation when feeding



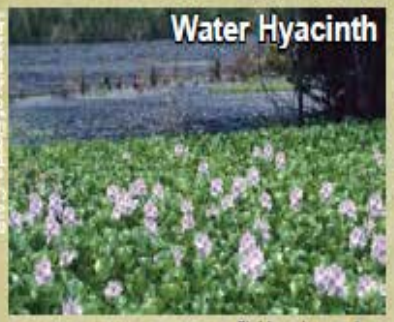
Aquatic Invasive Species

Controlling and Identifying Aquatic Invasive Species in Louisiana

www.wlf.la.gov

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

BEWARE



Eichhornia crassipes

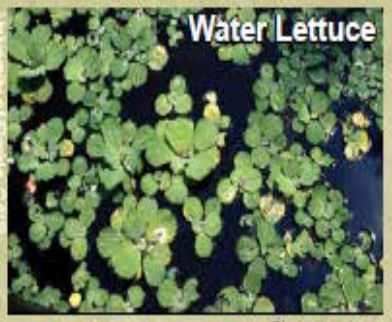
Origin: Amazon Basin, South America

- Free floating
- Leaves shiny green, leathery, and oval with gently incurved sides that stand erect
- Leaf veins are dense and numerous
- Spongy thick stalks
- Purple flowers with six petals
- Roots are dark and feathery

Salvinia molesta

Origin: Brazil

- Free floating
- Small, oblong, spongy, green leaves in whorls of three; two floating and one submerged
- Margins of mature plants curl inward
- Leaf surface has rows of hairs that, when magnified, are eggbeater shaped. Hairs give the leaves a velvety appearance and repel water
- No flowers



Pistia stratiotes

Origin: Amazon Basin, South America

- Free floating
- Resembles a floating open head of lettuce
- Leaves are thick, hairy, ridged, and pale green
- Leaf margins are wavy (with top margins scalloped)
- No leaf stems
- Flowers are inconspicuous
- Fruit is a green berry
- Numerous feathery roots hang submerged beneath leaves

Hydrilla verticillata

Origin: China/Asia

- Submerged perennial
- Stems are slender and branched, covered with small pointed, often serrated, leaves arranged in whorls of four to eight
- Leaf midribs are often reddish with one or more sharp spines
- Branching stems reach the surface and form dense mats
- Small white flowers

Salvinia minima

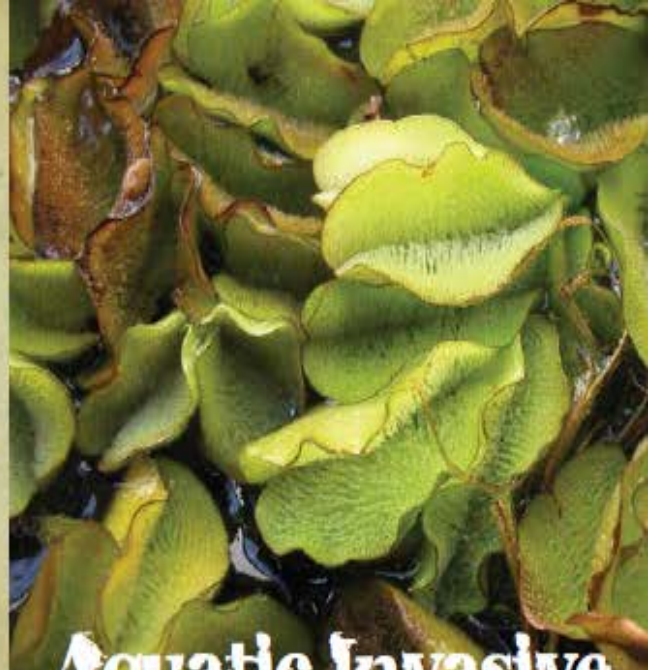
Origin: South and Central America

- Free floating fern
- Similar in appearance to giant salvinia, except has stiff leaf hairs with branches free at the tips
- Root-like structures hang below the surface
- No flowers

Alternanthera philoxeroides

Origin: South America

- Emerged perennial
- Long, branched, hollow stems
- Leaves are simple, elliptic, and opposite with smooth margins
- Solitary white flowers that grows on stalks during warm months
- Fibrous roots



Aquatic Invasive Plants

Identifying and Preventing Aquatic Invasive Plants in Louisiana

www.wlf.la.gov

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

Aquatic Invasive Plants Can Cause Serious Environmental and Economical Harm

Impacts

Reduce or eliminate native fish, bird, and plant populations
- Out-compete native plants
- Alter fish habitat
- Reduce waterfowl habitat and food

Clog waterways
- Limit boating and fishing access

Alter water quality
- Cause changes in pH
- Reduce dissolved oxygen
- Increase temperature

A Louisiana waterbody plagued by giant salvinia.

Control Efforts

There are various control methods that have been used to combat the spread of invasive plant species. Each one has pros and cons in its ability to treat infested waterbodies.

	Pros	Cons
CHEMICAL		
Herbicides	✔ Quick treatment, effective, can improve fish habitat	✘ Costly; weather dependent
BIOLOGICAL		
Alligator Weed Flea Beetle	✔ Can thin and limit alligator weed growth to allow navigation in previously inaccessible areas	✘ Localized effectiveness only during parts of growing season
Salvinia Weevil	✔ Species-specific insects that feed on the buds of common and giant salvinia and whose larvae tunnel into the rhizomes of the plant causing it to die and sink	✘ This is a long-term control measure that can take several years; very intolerant of cold temperatures
Tripold Grass Carp	✔ Sterile, non-reproducing grass carp which consume submerged aquatic vegetation	✘ Not specific in the vegetation it consumes; older, bigger fish are not as effective
MECHANICAL		
Drawdowns	✔ Cheap, effective, and can improve fish habitat	✘ Require dry conditions and long time frame; restricts boating access
Physical Removal	✔ Can target specific areas; available on windy days or when other options are not available	✘ Extremely labor intensive

How Can You Help?

Preventing new introductions is the best and most cost-effective way to control the impacts of invasive species. Fortunately, there are a few simple actions you can take to prevent their spread:

INSPECT your boat, trailer, and equipment. Remove any visible plants, animals, or mud before leaving a waterbody.

REMOVE unwanted bait from boat, live well, or bucket. **DISCARD IN TRASH, NOT WATER!**

DRAIN water from your boat, motor, live well, and bilge before leaving a waterbody.

RINSE and **DRY** your boat, trailer, and fishing equipment to remove or kill species that were not visible when you left a waterbody. Before going to another water body, rinse boat and trailer with hot (104 degrees) water or allow boat and trailer to dry for at least five days.

Learn to identify aquatic nuisance species and report any new infestations to the Louisiana Department of Wildlife and Fisheries at (225) 765-2328.

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Section 6: Managing For Wildlife

A wildlife management plan is a description of the short-term objectives and long-term goals that will be met by manipulation of habitat, wildlife populations, and people. Management plans explains how these objectives and goals can be reached for a specific location. All species need food, cover (or shelter), space, and water. A wildlife management plan must address all four of these needs.

Wildlife management takes into consideration the ecological principles such as carrying capacity of the habitat.

The carrying capacity of an environment is the maximum population size of a biological species that can be sustained by that specific environment, given the food, habitat, water, and other resources available.

Common wildlife management practices:

- Hunting

- Trapping

- Selective cutting of trees opens the canopy of the forest, allowing the understory to grow

- Fires and selective burning

- Food plots

Common wildlife management practices continued:

- **Conservation easements (agreement between a landowner and a land trust or government agency that permanently limits uses of the land in order to protect its conservation values)**

- **Wildlife refuges and wildlife management areas**

- **Creating snags**

- **Controlling invasive plants**

Washing feet and fish nets can help prevent the spread of invasive species such as Salvinia and Water Hyacinth

Which of these and other management practices are applied will depend upon what species or habitat type you are managing for.

If you are a property owner and you want to mange for a certain species or habitat type, you would contact different agencies for assistance. Here in Louisiana, the Department of Wildlife and Fisheries (LDWF) (state agency) or the USFWS (federal agency) can help.

LDWF

- Helps to protect all wildlife and all aquatic life within the state of Louisiana. LDWF specializes in assisting with game and nongame species management. So for example, if you wanted assistance in modifying habitat for deer, quail, or songbirds, you could ask for assistance from LDWF.

USFWS

- Helps to protect and recover threatened and endangered species and monitor and manage migratory birds. So for example, if you wanted assistance in modifying habitat for Gopher Tortoises or Red-cockaded Woodpeckers, you could ask for assistance from the USFWS.