

WETLANDS

Intent:

To depict the functions and value of the wetlands as a critical element in nature's ecosystem and the need for conservation methods to control their decline. To identify the life forms that make their homes in the wetlands.

Content:

Wetlands are just that--**WET LANDS**--amazing habitats where land and water meet. They may be any size or shape and may be found inland or along coastal areas. Every wetland has water, special soil, and specialized plants. Wetlands may be any size or shape and contain fresh, salty, or brackish (slightly salty) water. They may be always wet, regularly or infrequently flooded, or just seasonally wet. There might not even be water standing on the surface of the ground--because the water may have dried up for a while or may only be saturating the soil. Because of the prolonged presence of water, the soil in these areas (called hydric soil) develops special characteristics. What the soil looks and feels like will depend upon the initial organic materials and minerals that were found in the soil. Not all wetlands have plants growing in them, however, those that do, have plants that are specially adapted to life in wet conditions. Wetland plants--herbaceous (soft stemmed or nonwoody) plants, shrubs, and trees are commonly referred to as hydrophytic (water loving) plants or hydrophytes.

Herbaceous plants can be categorized by their location in water. **Emergent** plants are rooted in the soil but have stems, leaves, flowers, and fruits above the water surface. Common types include arrowhead, rushes, and cattail. **Floating plants** may be either free-floating or rooted in the soil. They have leaves on the water surface and carry flowers or fruits just above the surface. Common species include the water lily and duckweed. **Submergent** plants grow completely beneath the surface, including eelgrass, wild celery, and coontail. Flora with woody stems may live along the water's edge or entirely out of the water. The most common types of wetlands are marshes, swamps, and bogs or fens.

Marshes: fresh, brackish, or saltwater wetland; mostly "soft" (herbaceous) plants that grow up out of the water; frequently or continually flooded; found on edges of rivers, creeks, ponds, lakes, in isolated depressions, or along the ocean, bays, or estuaries.

Swamps: wetland with mostly woody-stemmed plants such as trees or shrubs; often associated with rivers or slow streams, or isolated depressions; frequently flooded in spring, but may have no water showing by late summer.

Bogs/Fens: peat accumulating wetlands found mostly in northern climates; limited drainage; supports evergreen tree and some shrubs and marsh like

plants, and acid-loving mosses—particularly sphagnum moss. Peat is the dead remains of plants, mostly mosses that have piled up in deep layers over many years. Peat is full of holes that soak up water like a sponge, making the ground squishy and wet. Because the water in a bog is acidic and has little oxygen, very few animals live there. Whatever you call them, wetlands are amazing habitats. Each type is an important **habitat** for a variety of animals that are specially **adapted** for their water logged home.

ECOLOGICAL BENEFITS

Wetlands provide many ecological benefits:

Prevent or reduce flooding--they catch, store, and slowly release runoff, protect against storm damage--in coastal areas, wetlands absorb the brunt of ocean storms as they hit shore, vegetation can absorb and dissipate the forces associated with wave action to reduce erosion along stream banks and shorelines;

Vital to our water supply--they recharge or replenish the aquifer (the underground layer of water used to supply wells) by slowly releasing stored water to the groundwater supply.

Can be a great help in dealing with polluted water--they act as natural filters, slowing the velocity of water flowing through them. This allows silt and sediment to settle out before the water is released to other wetlands, lakes, or streams. Caught in wetlands, pollutants are kept from degrading the quality of surface and groundwater. Excess nutrients will stress an aquatic system, but wetland plants filter nutrients from passing water and use them in their own metabolism.

Help keep our environment in balance--they provide habitat (food, water, shelter) to numerous species of wildlife. Many creatures that live most of their lives in other types of habitats were born and raised in wetlands. Wetlands are one of the most productive habitats on Earth, providing a strong base of plants and animals for the world's food web.

DECLINE OF WETLANDS

Several major causes are cited for wetland loss and degradation. Basically, the losses can be attributed to the actions of humans or to natural causes. Listed are several causes of wetland loss and degradation and to what they can be attributed:

HUMAN ACTIONS:

Drainage - of wetland for conversion to other uses.

Dredging and stream channelization - to change the channel of a stream.

Deposition of fill material - to reclaim the area for building projects or trash dumping.

Diking and Damming - construction of dikes, ditches, parking lots, etc, which change the flow of the water.

Grazing by domesticated animals - to fill and use for pasture land.

Discharge of Pollutants - disposal of toxic wastes or runoff carrying pesticides, fertilizers, and other contaminants.

Mining - surface coal mining can convert wetlands and acidic drainage from mines can degrade wetlands.

Alteration of hydrology - anything that changes the properties, distribution, and circulation of water.

NATURAL CAUSES

Erosion - caused by wind and rain.

Droughts - loss of plants and water.

Hurricanes and other storms - destroy plant life and pollute the water.

Overgrazing by wildlife - pollute the water and destroy plant life.

VALUE OF WETLANDS

Flood Control and Flood Protection - can reduce flooding by slowing down the force of flood waters and by protecting temporary storage of large amounts of storm or snow-melt water. Help protect property by reducing damages to roads, bridges, and crops. Trees and vegetation help slow the speed of flood water.

Water Quality Improvement - deals with polluted water by acting as a natural filter, slowing the velocity of water flowing through them. This allows silts and sediments to settle out before the water is released to other wetlands, lakes or streams. It absorbs contaminants and traps contaminants.

Ground Water Recharge and Discharge - Water percolates from wetlands into aquifers, raising the level of the water level.

Storm Surge Abatement - absorb and temper the impact of storm surges. Act as storm buffers and can withstand major storms without sustaining lasting damage.

Wetlands Habitat - Migrating birds utilize wetlands for feeding and stop-over points for rest. Many fish are wetland dependent. Muskrats, beavers, turtles, frogs, water snakes, as well as many others are dependent upon wetland habitats. A mother skunk may wander along the bank with her babies, a great blue heron will guard its nest on the island, a wood duck will lay her eggs in the wooden egg boxes provided, turtles will bask in the sun on an island, a water snake will stick its head out of the water as it swims, a spider will spin its web on the branch of a tree, lizards will scamper on the bank. Life teems in and around the wetlands.

Education, Recreation, and Aesthetics - Wetlands are living museums. They serve as outdoor laboratories where unique plant and animal species can be observed. The principals of ecological systems such as energy flow, recycling, and carrying capacity can be studied firsthand. They are beautiful areas that are capable of evoking pleasure and awe when we witness ducks taking to the air from a marsh, a great blue heron intently stalking its prey or the night sounds of a summer marsh. They provide opportunities for recreational activities such as hiking, canoeing, fishing, bird watching, and photography.

IMPORTANCE AND BENEFITS OF WETLANDS

The Wetland can be explained simply by using metaphors:

1. As a **sponge** absorbs water on the kitchen cabinet, it absorbs excess water caused by runoff and retains moisture for a time even if standing water dries up;
2. As we rest in our bed, it is a **resting place** for migratory birds;
3. As our baby sleeps in a bed **or cradle**, it provides a nursery that shelters, protects, and feeds young wildlife;
4. As an **egg beater** mixes food, it mixes nutrients and oxygen into the water;
5. As a **strainer** strains pulp from juice, it strains silt, debris, etc. from the water to keep our water supply clean;
6. As a **coffee filter** provides clear coffee, it filters smaller impurities such as nutrients and toxic waste from water;
7. As an **antacid** neutralizes stomach acid, it neutralizes toxic substances;
8. As **cereal** provides us with nutrients, it provides nutrient-rich food for wildlife;
9. As soap cleans our body, it helps cleanse the environment.

WHAT THE EYE CAN AND CANNOT SEE

If we close our eyes and listen in the Wetlands, we might hear wildlife moving in the water grass or trees. With eyes closed, we could smell the water, the plants, and the animals, depending on where we are and what is around us. If we take the time to lie down on the boardwalk and look into the water quietly, we might see turtles, snakes, fish, algae, moss or other animals swimming in the water.

We need to train our senses to see and hear what is not obvious.

The Tulsa Zoo Wetland is a marsh. You can see many different types of plants in a marsh, but some of the most important ones are so small you need a magnifying glass or microscope to see them. These are **algae** (phytoplankton) --tiny green plants that float around in water. Algae are eaten by **zooplankton** (tiny floating animals) and insects, which are eaten by small fish, which in turn are eaten by bigger fish, birds and mammals. Zooplankton, as well as the eggs, larvae, and nymphs of many animals, are not visible to the naked eye.