CONSERVATION CAMP

CLINCH POWELL RC&D

HEALTHY WATER WEALTHY WORLD

CONSERVATION CAMP WORKBOOK

A companion workbook to a day in nature's classroom for sixth grade students and teachers in Claiborne, Grainger, Hancock, Hawkins and Union Counties.

Sponsored By

The Clinch-Powell RC&D Council

Printed on Recycled Paper

CLINCH-POWELL
RC&D COUNCIL ENVIRONMENTAL EDUCATION PROGRAM

Route 2, Highway 11-W
P O BOX 379
RUTLEDGE, TN 37861

(865) 828-5927

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HEALTHY WATER, WEALTHY WORLD
CONSERVATION CAMP
WORKBOOK

TABLE OF CONTENTS

FISHY WHO'S WHO

Objective

Students will expand their knowledge of the different species of fish that occur in this area and why clean water is important to them.

Key Words

Species, Scavenge, Predator, Detritus

Summary

There are fish in virtually every area of North America. They play a variety of roles in the aquatic ecosystems. Some are predators on other aquatic life. Some are feeders on plant material. Still others scavenge or feed on detritus. Some species deposit eggs in special nests, some have live young. They exhibit a wide range of behaviors.

While some are well known by those who fish, others are less conspicuous to humans. The health and well-being of these species depends on the quality of the water.

Study Questions

1. Name five species of fish that are important to the rivers in your area.

2. Why are those fish important?

3. What dangers are facing the aquatic life in the Clinch and Powell Rivers?

RIPARIAN RETREAT

Objective

Students will recognize the characteristics of riparian habitats and understand the importance of these areas to clean water, animals, plants and humans.

Key Words

Riparian, Marsh, Nesting Birds, Burrowing Animals

Summary

Riparian areas are important and valuable in many ways. Riparian areas are in the green ribbons found on the edges of water courses (streams, lakes, ponds). These conditions are excellent for plants that grow best when their root systems are near water.

Riparian areas provide space, food, shelter and water for plants and animals. Riparian areas are also "highways" for animals that depend on water bodies for food and shelter. The plants in these areas provide food and shelter for animals as large as deer. Trees and marshy areas provide shelter for nesting birds and the water banks provide homes for burrowing animals.

The dense vegetation found around many riparian areas cleanse runoff water before it flows into the stream. Among the many values of riparian areas are their beauty and recreational values to humans. They are used for fishing, hiking, camping, picnicking and resting.

Study Questions

1. List 10 things you would expect to find in the riparian areas on the Clinch and Powell Rivers.

2. What are some other words you know used to describe riparian areas?

3. Name four animals that you would expect to find in a riparian area.

WATER CHECK-UP

Objective

Students will learn to observe water quality monitoring equipment and how it is used. They will see aquatic invertebrates and determine the chemical condition and biological health of the stream.

Key Words

Benthos, Dissolved Oxygen, Indicator Animals, Rapid Bioassessment Survey, Turbidity, Aquatic Invertebrates

Summary

There are many ways to determine the water quality and the overall health of a stream or river. Biologists often use a process called Rapid Bioassessment Survey, which tests the physical properties and the biological community (benthos) to quickly determine the quality of the water.

Invertebrate (no backbone) animals known as aquatic invertebrates that live a portion of their life on the bottom of streams, rivers and lakes are known as benthos. Benthos, as with other animals, have certain habitat requirements, such as dissolved oxygen and low turbidity, in order to live and grow within their environment. Sometimes things can happen to an environment, such as pollution, that will affect the diversity and numbers of animals that are able to live there.

By collecting and counting the individual kinds of benthos in a stream, especially indicator animals, an investigator can determine if pollution is occurring or has recently occurred. Some indicator animals are very sensitive to water pollution and cannot live in polluted streams. Others can tolerate high amounts of pollutants. The presence or absence of certain invertebrates helps the biologists determine the water quality of a stream.

Study Questions

1. What is water pollution?

2. Name as many different kinds of pollution as you can.

3. How are aquatic invertebrates indicators of water quality?

WATER AND WILDLIFE HABITAT

Objective

Students will understand the importance of clean water for wildlife habitat.

Key Words

Pollution, Habitat, Predator

Summary

Wildlife population is dependent upon the quality of the habitat. The habitat must include food, water and cover. The population of a given species of wildlife is determined by the most limiting factor. There are many sources of water for wildlife. Rivers, lakes, ponds, streams, dew and potholes are all sources of water.

There are several sources of pollutants that pose dangers for wildlife. Water may be contaminated from pollutants from several sources. These sources include sewage, industrial construction, solid wastes, agriculture and household chemicals.

Study Questions

1. Name specific examples of pollutants from the sources listed in the discussion.

2. What determines the population of a specific species of wildlife in a given area?

3. How could a predatory animal be poisoned by contaminates found in the mud at the bottom of a lake?

WATCH OUT FOR WILDLIFE

Objective

Students will develop an awareness and appreciation for locally important threatened and endangered wildlife species.

Key Words

Habitat

Summary

The quality of our water has both direct and indirect effects on our wildlife species. Grassy Creek Wildlife Foundation deals with some of these effects on migratory birds as we attempt to rehabilitate many that have suffered from assorted water hazards. A number of our threatened avian species within Northeast Tennessee depend either on water or marshland habitat areas for their existence and we hope to acquaint the children with ways they can help those already affected and offer suggestions about how they can prevent adverse affects on others. Their awareness of habitat importance is the first step, followed by an understanding of particular species requirements within these areas. We hope to instill both desire to help and confidence that their efforts can make a difference.

In order to accomplish this, we intend to show them freeze-dried specimen of waterfowl and marsh birds, an assortment of posters, and tell them about the threatened and endangered ones in our part of Tennessee. We will relate this to particular water pollution problems and tell them how they can directly help the birds through actual clean-up methods and indirectly through legislative means.

Study Questions

1. Can you list three avian species that are affected by polluted water?

2. How many pollution hazards can you name that harm our avian species?

3. Why is it important to try to save the threatened and endangered avian species which use wetlands and marshlands?

WHAT IS THE BENEFIT OF SURVEYING?

Objective

Students will see some of the basic tools and instruments of surveying and learn how they operate.

Key Words

Surveying, Land Measurement

Summary

Surveying is the study of measuring and representing the earth's surface accurately. The focus is on the types of instruments that are used in surveying and their capabilities.

Study Questions

1. What are three types of distance measuring devices?

2. What type of surveying instrument is to be used when excavating a basement or pond?

3. What conservation practices are done on the farm by surveying?

WHERE DOES YOUR WATER FLOW?

Objective

Students will learn some of the basic components of forest hydrology and be presented an example of how it can affect wildlife.

Key Words

Forest Hydrology, Watershed

Summary

Forest hydrology is the study of water inflow and outflow in a forest ecosystem. The basic unit of study is the watershed, which is most easily visualized using topographic maps on which watersheds can be plotted. Factors such as climate, vegetation type, season, soil and parent material interact to influence the input and output of water from the forests streams.

Various factors will be discussed. Also a case history of how wildlife can be adversely affected by poor forest management practices will be presented.

Study Questions

1. What are some of the major and minor watersheds in which you live?

2. How can a forest store water?

3. Can the unchecked force of water be detrimental to ecosystems and populations of plants or animals?

PIGTOES AND HEELSPLITTERS

Objective

To increase students' awareness of the variety and importance of mussels in the river, their interesting life cycle and how to protect them.

Key Words

Symbiotic, Filter Feeder, Sedimentation, Indicator Species, Biodiversity, Non-game fish, Glochidia, Bivalves

Summary

Like the canary in the coal mine, freshwater mussels are an indicator of good water quality. The Clinch and Powell rivers are tremendously important because of the number and variety of aquatic and terrestrial organisms found there. Few rivers in the world have this much biodiversity and it is important that we find a way to protect this precious resource. Freshwater mussels are the world's most threatened animal group. They live up to one hundred years and part of their life cycle depends on the fish they share the river with. These quiet and unusual creatures are an essential part of the rivers we enjoy in our counties.

Study Questions

1. Why is it a good sign for wildlife and people if there are mussels in the river?

2. Why is it important to take care of the non-game fish species in the river?

3. What are some of the major threats to the mussels and what can be done about them?

HOUSEHOLD HAZARDOUS WASTE

Objective

Students will compare warning labels on household products such as cleaners, pesticides, and automotive fluids and be able to decide what products pose the least risk to their own and their families' risk as well as the environment. Students will learn how to properly use and dispose of potentially dangerous household products.

Key Words

Hazardous, Caution, Warning, Danger, Toxic

Summary

When buying various chemicals to use around your house, you and your family have many choices to make. One important factor is how hazardous the material is. This is a way of evaluating the risk that the product poses to you, your family, or the environment. A product is defined as hazardous if it is toxic (poisonous to living organisms), reactive (capable of violent reaction with water or air), ignitable (catches fire or explodes easily), or corrosive (capable of damaging living tissue or other materials on contact).

There are laws requiring manufacturers to warn consumers about potential hazards involved with their products. Because of this there are signal words on labels of potentially hazardous products.

The product labels also contain important information about safe use of the material. The label may say "USE ONLY IN WELL VENTILATED AREA" or "DO NOT USE NEAR OPEN FLAME" or a similar instruction restricting the product's use. These directions should be followed carefully because improper use could put you or those around you in danger.

Study Questions

1. How can consumers buy products that are the least hazardous, i.e. will have the least negative impact on the
   environment and on the health of my family?

2. Why is it important to follow the directions on the label?

3. Why should these materials be disposed of properly when they are no longer useful?

CONSERVATION FARMING

Objective

Students will gain an appreciation for different kinds of farming practices and how they affect water quality.

Key Words

Conservation Tillage, Pesticide, Herbicide, Fungicide, Fertilizer, Grassed Waterway, Contour Farming, Cover Crops, Crop Rotations, Strip Cropping

Summary

Farmers use chemicals to help them grow food and fiber crops. These chemicals may include herbicides, fertilizers, fungicides, pesticides and others. When they are used correctly and disposed of safely are very beneficial. Without them it would be very difficult for farmers to produce enough food to feed all the people in the world.

Farming practices have a big effect on water quality. Practices such as "turn plowing" expose bare soil and make it easy to wash away during heavy rains. This is called soil erosion. When soil washes into streams, rivers and water supplies, it pollutes the water by making it muddy. The soil particles also carry chemicals which may be poisonous to aquatic life.

The best farmers use conservation practices to protect their soil. One of the best practices is conservation tillage. Conservation tillage is a method of farming which leaves a cover to protect the soil surface and prevent pollution. Other types of conservation practices are grassed waterways, contour farming, cover crops, crop rotations and strip cropping.

Study Questions

1. Name a good conservation farmer you know.

2. Which conservation practices does this farmer use?

3. Name three advantages of conservation farming.

LITTER BUG BLUES

Objective

Students will learn about the legal and proper disposal of waste and the penalties for illegal disposal. They will learn about recycling and the reuse of products.

Key Words

Toxic, Energy, Recycling, Biodegradable, Incinerate

Summary

There are many toxic chemicals used in the world. If not used properly these chemicals can be very hazardous. Most chemicals are required by law to be labeled to tell of the specific dangers to humans and the environment. Household chemicals should not be mixed together. Chemicals which are fairly safe when used alone, may become toxic when mixed together.

Litter and garbage can also be dangerous to human life and wildlife. Water passes through all trash which is left on top of the ground and then travels into the rivers, lakes and drinking water sources. This water is polluted and possibly poisonous. Garbage should be dispose of safely to keep water clean.

There are laws against littering in Tennessee. Penalties may include fines and jail time.

Recycling is an excellent way to decrease the amount of garbage on earth and to conserve natural resources. We can make choices in our lives that will be beneficial to the environment and to our fellow humans.

Study Questions

1. Name five things you can start recycling in your home.

2. How can we reduce the amount of garbage we produce?

3. How does it help the environment to reuse or recycle things?

SINKHOLES SHOULDN'T BE STINKHOLES

Objective

Students will become aware of the dangers to the underground water supply when trash and wastes are dumped into sinkholes.

Key Words

Sinkhole, Contaminate, Crevice, Limestone

Summary

Sinkholes are very common in East and Middle Tennessee. They are formed when limestone rock below the surface of the soil wears away and collapses. Sinkholes look like "bowls" in a field. You can be sure an area is a sinkhole if all the water which drains into it can only leave by seeping through the ground. Sinkholes can be very large or small. They are very important to us because they "catch" rainwater and then releases it slowly into the groundwater supplies.

Many people use sinkholes as personal dumps. They dispose of pesticides, household garbage, dead animals, chemicals and other items into the sinkholes. This is dangerous because sinkholes drain directly into the underground water supply.

Instead of rainwater being purified by passing through layers of soil, it passes over the garbage and chemicals into the sinkhole. It then travels through cracks and crevices in the limestone rock to reach the underground water supply. This is the same water supply that people use in their homes if they have a well or use spring water. If the water has passed through a dump in a sinkhole, it may be contaminated and dangerous to drink.

Study Questions

1. Are there sinkholes in your area?

2. What type of wastes are being dumped in them?

3. What diseases can people get from contaminated underground water?

LEAF LITTER LEGACY

Objective

Students will recognize the value of leaf litter on the forest floor in preventing erosion and water pollution.

Key Words

Best Management Practices, Stream Management Zone

Summary

Forests can contribute to soil erosion and water pollution problems when careless activities are carried out. Approximately six percent of the sediment in streams is a result of forest erosion. There are 7.9 million tons of soil lost from forests each year. Cattle grazing, logging roads, skid roads and log landings are the primary causes of forest erosion.

Leaf litter on the forest floor and healthy tree root systems are the best protection from erosion. When timber is harvested or after a fire, more erosion occurs because the leaf litter is gone. when soil moves it has a detrimental effect on the forest.

There are conservation practices which can be used during logging activities to protect the soil. Loggers who care about the forest and the land will build log roads in a way which controls runoff water before it reaches the streams. These types of activities are called Best Management Practices. Landowners who are planning to have timber harvested should require loggers to use BMPs on their land.

Study Questions

1. What happens to leaf litter after it decomposes?

2. Name ten different uses of forest products.

3. Why are gullies and erosion problems hard to fix in forested areas?

WHERE DOES THE WASTE GO?

Objective

Students will learn what happens to the garbage they throw away and how critical it is that they learn to reduce the volume.

Key Words

Decompose, Solid Waste, Recycle, Landfill, Reclaim

Summary

Every day we throw out everything from toothpaste tubes to old TV sets, car batteries to plastic milk jugs, jelly jars to paper. You may not personally stuff six pounds of solid waste in the trash bag everyday, but if you add up all the waste from your house, classroom and school cafeteria, from the restaurant where you ate, from the factories that make your clothes or paper, from the utility that generated your electricity and from the stores where you shopped, it amounts to about 6 pounds a day per person. Multiply that by 365 days per year, then 4.9 million Tennessee citizens, and your results show that Tennessee throws away more than 5.4 million tons of stuff each year! But, where is "away"? Is there such a place?

Most of Tennessee's solid waste ends up in landfills. A landfill is a place where waste is dumped, compacted and covered with dirt. Covering the trash everyday controls blowing paper, odors, insects and rodents. Unfortunately, many existing landfills, built before we realized the importance of strict environmental rules, now present a hazard to public health and the environment. When rainwater or melting snow seep into these poorly constructed landfills, reactions between the water and the trash produce a liquid called leachate. Leachate contains concentrated pollutants that can be harmful if it migrates into streams or groundwater. As waste decomposes in the landfill, explosive landfill gases develop which can move outward through he soil, killing vegetation and entering basements of nearby houses.

We will be paying to clean up and reclaim many of these leaking landfills for years to come. Even though the old landfills are serious environmental problems, we have learned some valuable lessons from them. Recently, new laws have been passed that require landfills to be constructed so to reduce the potential hazards to our environment. The laws specifically protect groundwater, control explosive gases and reduce the amount of toxic waste entering the landfills. The following diagram illustrates some of the differences between old landfills and the standards to which new landfills must be built.

The new landfills require protective man-made liners to retain the leachate like a plastic bowl. Leachate and landfill gases are collected and pumped out of the

landfill through a piping system. The leachate is treated at a waste water treatment plant and turned into safe, clean water. The gases can be burned as fuel for heating and cooling buildings. The landfill operators must carefully and frequently test the groundwater, surface water and air around the landfill to insure that no contaminates are entering the environment.

But what is the solution to our garbage glut?
Reduce, reuse, recycle. Each year Americans throw away approximately 60 billion cans, 28 billion bottles, 4 million tons of plastic, 40 million tons of paper, 100 million tires and 3 million cars. All of these materials can be **recycled** to save energy, save landfill space and reduce pollution. The remainder of our waste that is landfilled must not be forgotten, but controlled and managed for decades until it has safely decomposed and stabilized. **We are all responsible for what we throw away and the impacts this waste may have on our environment.**

Study Questions

1. Name three specific ways you can personally reduce the amount of trash you dispose of.

2. What does rain turn into when it flows through older landfills? Why must it be controlled?

3. Why is it important to protect groundwater?

MONEY TREE

Objective

Students will develop an appreciation of general forest ecology.

Key Words

Ecology, Canopy

Summary

The forest resource is very important. Trees provide shade, beauty and many wood products to make our lives more enjoyable. But, they also serve other important functions. Leaves absorb carbon from the air and release oxygen in its place. Tree canopies provide a "speedbump" to raindrops and lessen the impact they have on soils. Forests provide homes and habitats for many species of wildlife. Extensive root systems hold soil in place and organic matter from leaves and debris enrich the soil.

Forests provide income to many people. Timber is the second leading agricultural crop in Tennessee. Forest products contribute $4 billion to the economy of Tennessee every year.

Study Questions

1. Why do trees grow straight up even when they are in the side of a mountain?

2. What is the Tennessee State Tree?

3. How can we improve our forested land and harvest it at the same time?

SHOPPING GREEN

Objective

Students will compare and determine what products, when given a choice, are most "GREEN". Students will learn how to protect the environment by "PRE-CYCLING".

Key Words

Post-Consumer Waste, Recyclable, Packaging, Pre-Cycling

Summary

When grocer yshopping we all make choices for different reasons. We may choose the least expensive items while others may buy the most expensive. Still others may buy the biggest or most colorful.

One thing that we should ask before we buy, however, is "How will this product effect our environment after I buy it?" and "What is this made of and where will it go if I throw it away?" These are questions that can be answered if we all begin to "Shop Green" and "Pre-Cycle."

Valuable landfill space can be saved through recycling the products or packaging that we buy everyday. If a product states that it is made of recycled material or post-consumer waste, you know the material has already been saved at least once from entering the earth in a landfill. Plastics, aluminum, paper and glass are all materials that can be recycled.

Another question to ask is whether or not the item has been over packaged. If we buy less bulk, we throw less away. This is "Pre-Cycling". When we buy a product we are also buying trash, so we should make selections based on less packaging. This will save valuable landfill space and save money! If we purchase with Pre-Cycling and Shopping Green in mind then that's great for everyone, including the environment.

Study Questions

1. What is "Shopping Green?"

2. What are some things to look for while Pre-Cycling?

3. Why are these things important?

ENVIRO IQ

Objective

Students will be quizzed on their general knowledge of selected conservation topics.

Key Words

Household Hazardous Waste

Summary

Many household products that we use routinely in our homes and lifestyles become hazardous to our health when simply tossed into the trash or washed down the drain. Chemicals washed down drains and thrown into landfills can end up back in our drinking water source. This can affect our health and the environment. Substitutes for many of these products are available. These substitutes are safe, easy alternatives to cleaners, detergents, air fresheners and insect sprays.

With the growing amount of trash being taken to landfills, space is quickly being used up. Many items such as plastic, aluminum, steel, iron, paper, batteries, oil and tires can be recycled. These materials can be used to make new items or as fillers. Used oil and tires are often used in making asphalt.

There are many occupations associated with agriculture other than farming. Processing, trucking, finance, grocery store clerks and even meteorologists play key roles in agriculture and conservation. Trees help the environment in many ways like providing shade and controlling erosion, and forestry is an important agriculture enterprise.

Study Questions

1. Name some common household items considered hazardous waste.

2. Name five occupations associated with agriculture.

3. Name five ways trees help the environment.

READ A MAP
YOU'LL NEVER BE LOST FOR LONG!

Objective

To introduce and familiarize students with map reading. Different maps will be used: road maps, recreation maps, navigation maps, topographical maps, and perhaps others.

Key Words

Legend, Direction, Features, Special Use Maps, Roads, Facilities, Contours, Elevation, etc.

Summary

Being able to read a map is a basic skill necessary to travel and perform most work. It enhances leisure time, hunting, boating, hiking and almost any outdoor experience. Reading a map is helpful even in picking out a house! We'll look at several different kinds of maps and talk about some basic concepts in orientation, perspective and reference points. We will find where we are and other features on the maps.

Study Questions

1. What are some common maps you might use everyday?

2. What else can you use a map for?

3. Where can you find maps?

4. How do you find your way around on the map?

THINK ABOUT IT

Objective

Students will test their knowledge in general water quality and river protection.

Key Words

Endangered Species

Summary

The Clinch and Powell Rivers flow from Virginia into Tennessee and drain all or parts of Claiborne, Grainger, Hancock, Hawkins and Union Counties. These rivers are two of the last free flowing rivers in the Tennessee River system. Free flowing means the flow of water is not controlled by dams upstream. The Clinch and Powell are known worldwide for their biodiversity. Biodiversity means there are a few specimens of many different species. When a river is biodiverse that is a good sign that it is healthy. The Clinch and Powell Rivers are home to 17 threatened and endangered species. These rivers are especially noted for the vast number of species of freshwater mussels living there (about 50 species). Mussels are one of the first species to die in a polluted river because they live on the river bottom and filter water through their bodies. When the pollution builds up to a toxic level in the mussels, they die. This makes mussels a good indicator of water quality.

Pollution is a rising concern in the Clinch and Powell Rivers as well as other rivers across the nation. Pollution comes from many sources classified as either point or nonpoint. Nonpoint source pollution (small amounts of pollution coming from many places and sources) is the main threat in the Clinch and Powell Rivers. The most common form of nonpoint source pollution is sediment. Sediment is soil suspended in water and makes the water appear muddy. Soil erosion is the biggest producer of sediment and may come from farming practices and construction sites.

Study Questions

1. What is an endangered species?

2. Name three sources of nonpoint source pollution.

3. Name five things you can do to stop water pollution.

WETLANDS

Objective

Students will gain understanding of the importance of wetlands, and the plants and wildlife that depend on them.

Key Words

Wetlands, Sediment, Avian

Summary

Wetlands occur naturally. Wetlands can often be identified by the vegetation which grows in and around them. Cattails and rushes are two common plant species which grow in wetlands.

Wetlands act much like a giant earth filter and settling basin in nature. They are found frequently beside waterways like rivers and streams in flat and low lying areas. The wetlands 'catch' water which runs down from the hills and slows down when it reaches the wetlands. When the water slows, sediment and pollutants settle out of the water and are trapped. This keeps the rivers and streams cleaner and healthier.

Many animals call wetlands home and they provide productive breeding grounds for many species. Some wetlands, called potholes, look like very large ponds and are naturally occurring throughout the prairies and midwest states. These potholes are very important 'watering holes' to migratory birds who travel south for the winter from Canada and the northern United States. The disappearance of many pothole wetlands is responsible for the serious decline in avian species such as songbirds.

The wetland habitat is valuable and should be protected. In the past, the importance of wetlands was not well understood and many were drained, filled in with soil and destroyed. Although we have lost many valuable wetland resources, recent education and regulation efforts have begun to restore and protect remaining wetland areas.

Study Questions

1. Name three different plant species which grow in wetlands.

2. What are other three other common names for wetlands?

3. Name three different animal species which depend on wetlands for food, shelter and breeding grounds.

GLOSSARY OF KEY TERMS

Aquatic Invertebrates: No backbone animals that live a portion of their life on the bottom of streams, rivers and lakes.

Avian: Of, relating to, or derived from birds.

Benthos: The organisms living on streams, rivers or lake bottoms.

Best Management Practices: Practices which will protect the quality of the environment

Biodegrade: Decomposition by natural biological processes.

Biodiversity: The measure of species richness(number of different species) in a specific ecosystem

Bivalve: An aquatic organism with two matching shells such as an oyster or clam.

Burrowing Animals: Animals which dig holes in the ground for cover.

Canopy: Layer formed by the leaves and branches of the forest's tallest tress.

Carbon Dioxide: A heavy colorless gas.

Caution: The product has a minor risk of being hazardous.

Chlorophyll: A chemical in the leaf that combines the water and minerals with sunshine and carbon dioxide.

Conservation: The use of natural resources in a way that assures their continuing availability to future generations; the intelligent use of natural resources.

Conservation Tillage: A method of farming which leaves a 30 percent cover on top of the soil after the crop is planted.

Containment System: Will prevent an oil spill from spreading during the clean-up process

Contour: A line connecting the points on a land surface that have the same elevation.

Contour Farming: A method of farming where all operations are carried out on or as near to the contour of the land as possible.

Cover Crops: Plants which are grown to cover the ground between normal crop seasons.

Crop Rotations: A system of growing crops and sod in a regular alternating pattern over a period of years.

Danger: The product is extremely hazardous and may be very explosive, reactive, or pose a substantial risk if ingested.

Data: Factual information like measurements or statistics used as a basis for discussions and making decisions.

Deciduous: Trees, shrubs and bushes that drop their leaves in the fall and spend the winter dormant (asleep).

Decompose: To break down into basic elements; to rot. Decomposition is necessary for all life forms since it makes essential nutrients available for use by plants and animals.

Detritus: Dead plant, animal or other organic matter.

Direction: The line or course on which something is moving or is aimed to move or along which something is pointing or facing.

Dissolved Oxygen: Oxygen which is dissolved in water and available for use.

Ecology: The scientific study of the relations of living things to one another and to their environment.

Ecosystem: All living things and their environment in an area of any size. All are linked together by energy and nutrient flow.

Elevation: The height above the level of the sea.

Endangered Species: One which has so diminished in numbers that is destined for extinction unless drastic measures are taken to protect it.

Environment: The aggregate of surrounding things, conditions or influences, especially as affecting the existence or development of people or of nature.

Erosion: The process of eroding or state of being eroded. Natural processes, as weathering or gravity, by which material is moved on the earth's surface.

Evergreen: A tree or plant which stays green throughout the year. They do not loose their leaves in the fall.

Facility: Something that is built, installed, or established to serve a particular purpose.

Features: A prominent part or characteristic; special attraction.

Filter Feeder: An organism which feeds by filtering water through its system and digesting small particles of organic material.

Forest Hydrology: Study of inflow and outflow of water in the forest.

Fungicide: Any chemical preparation used to control fungal pests.

Geographic Information System: A means of using data stored on a computer to produce graphic (picture) images (mostly maps). The GIS retrieves information stored in a computer database to make the images.

Glochidia: The tiny larval stage of the mussel life cycle.

Grassed Waterway: A grassed area in the natural or constructed drainage way to slow runoff and prevent gully formation.

Habitat: The native environment of an animal or plant, or the kind of place that is natural for an animal or plant.

Herbicide: Any chemical preparation for killing plants.

Household Hazardous Waste: Any product found in the home that can be hazardous if not disposed of safely (i.e. floor cleaners, pesticides and paint products).

Indicator Animals: Animals which are extremely sensitive or very tolerant of certain pollution.

Landfill: A specially-designed site for the burial, disposal and decomposition of solid waste.

Land Measurement: Measuring field distances and areas to lay out soil and water conservation practices including slope, elevation and linear distances.

Legend: An explanatory list of the symbols on a map or chart.

Leisure Time: Time free from work or duties, i.e. time available to pursue recreational activities.

Limestone: A sedimentary rock found extensively in areas of karst topography.

Natural Areas: Sites used for recreational purposes which have no development and as little management as possible.

Nesting Birds: Birds which make nests to lay eggs in reproduction.

Non-game Fish: Fish species that are not actively fished for by fishermen, but are important links in the food chain and in the life cycles of other organisms.

Oil: Slippery, combustible liquid obtained from animals, vegetables, etc.; petroleum

Oxygen: A colorless, tasteless gaseous element, the most abundant and important yet discovered.

Packaging: What as item may be wrapped or contained in when bought.

Percolate: The filtration process of liquid through soil.

Pesticide: Any chemical preparation used to control populations of injurious organisms, plants or animals.

Photosynthesis: The process of chlorophyll combining water and minerals with sunshine and carbon dioxide to make sugar sap.

Pollution: Harmful substances used deposited in the air or water or land, leading to state of dirtiness, impurity or unhealthiness.

Post-Consumer Waste: Material that has already been used and then recycled.

Predator: An animal that lives by capturing other animals for food.

Pre-Cycling: Making purchases based on the amount of packaging.

Rapid Bioassessment Survey: A test used by biologists to test the physical properties and the biological community to quickly determine the quality of the water.

Reclaim: To rescue, clean up and repair a polluted or damaged site.

Recycle: The salvage and reprocessing of waste materials for reuse in the same form or to manufacture new products (cloth, glass, paper, metal, plastic, oil. etc..)

Recyclable: Item that can be recycled, but may not have been already.

Reservoir: Bodies of water which are collected and stored in natural and artificial lakes. Lakes or large inland bodies of water. In the Tennessee Valley, the reservoir system was created by constructing dams on the Tennessee River and tributaries. The dams are built to provide flood control, navigation channels, electric power production, recreation and adequate water supply.

Resource: Something that can be looked to for support or aid. An accessible supply that can be withdrawn from when necessary.

Riparian: Of, on, or relating to the bank of a natural course of water.

Sediment: Suspended soil particles such as; sand, silt and clay.

Sedimentation: The build-up of small soil particles on the bottom of a body of water that has a negative impact on the organisms living there.. This occurs as a result of erosion from the streambank and nearby fields.

Sinkhole: A natural depression in a land surface leading to an underground passage. Occurs frequently in limestone regions and forms by solution or by the collapse of a cavern roof.

Solid Waste: Garbage, trash, debris and other materials considered worthless or used-up that are discarded by humans.

Species: A class of organisms having some common characteristics or qualities.

Stewardship: The careful management of precious resources.

Stream Management Zone: The area on both sides of a watercourse which should be protected with permanent cover like grass or trees.

Symbiotic: The living together of two dissimilar species for all or part of their life cycle.

Strip Cropping: A system of growing crops and hay in alternating bands across a field.

Surveying: The layout and design of soil and water conservation practices using a surveyors level and simple engineering methods.

Topsoil: The surface layer of soil which is the most productive.

Toxic: Harmful, destructive or deadly

Turbidity: Having suspended or stirred up particles or sediment.

Warning: The product has a moderate chance of causing health risks for people.

Water Cycle: The recirculation process of water on earth and in the atmosphere.

Watershed: Unit of study of forest hydrology.

Weathering: To discolor, disintegrate, wear or otherwise affect adversely by exposure.

Wellness Movement: A trend toward living with emphasis on the prevention of illness through exercise, nutrition and other individual effort.

Wetlands: A lowland area that is saturated with moisture. Very productive wildlife habitat.