

---

# Contents

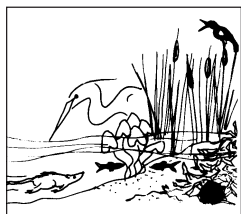
	<i>Page</i>
About Environmental Concern Inc. and The Watercourse.....	iii
Acknowledgments.....	v
An Orientation to <i>WOW!: The Wonders Of Wetlands</i> .....	xiii
Planning Guide: Suggested Wetland Study Units.....	xiv
Activity Format.....	xvi
Activities by Grade Level.....	xvii
An Invitation.....	xix
<b>Part I: Background Material for Teachers</b>	
<i>Chapter 1. Wetlands and People: Through Time and Across Borders</i> .....	3
<i>Chapter 2. Defining Wetlands</i> .....	10
Wetland Delineation.....	11
Hydric Soils	
Hydrophytic Plants	
The Hydrologic Regime	
Global Distribution and Factors Influencing Wetland Formation.....	15
<i>Chapter 3. Wetland Functions</i> .....	20
Physical/Hydrological Functions.....	20
Flood Control	
Coastal Protection	
Ground Water Recharge	
Sediment Traps	
Atmospheric Equilibrium	
Chemical Functions.....	23
Pollution Interception	
Toxic Residue Processing	
Waste Treatment	
Biological Functions.....	25
Biological Production	
Habitat	
Socioeconomic Functions/Benefits.....	26
Food	
Commercially Important Fish, Bird, and Animal Populations	
Fuel	
Timber and Fiber Harvest	
Recreation, Aesthetics, and Education	
Cultural Heritage and Archaeological Evidence	
<i>Chapter 4. Wetlands As Home</i> .....	31
The Protists.....	32
Vascular Plants.....	32

---

	<i>Page</i>
Wetland Animals.....	35
Coping with Low Oxygen Levels	
Maintaining an Osmotic Balance	
Successful Reproductive Strategies	
Methods of Dispersal and Migration	
Responses to Environmental Change	
Wetland Interactions.....	38
Habitat Niches	
Food and Energy Web	
Predator/Prey Dynamics	
<b>Chapter 5. How People Manage Wetlands.....</b>	<b>41</b>
What Are Some Management/Stewardship Options?.....	47
Mitigation/Creation	
Restoration	
Enhancement	
Acquisition	
A Management Sampler—Two Case Studies.....	49
The Colorado River Delta	
Wetlands and Flood Control on the Mississippi River	
<b>Chapter 6. Action for Wetlands.....</b>	<b>53</b>
A Citizen’s Wetland Action Guide.....	54
Inform Yourself	
Involve Yourself	
Some Wetland Enhancement Basics.....	55
Vegetation Plantings	
Creating Buffer Zones	
Exclude or Limit Domesticated Animals and Pets	
Restrict Off-road Vehicles	
Wildlife Habitat Additions	
Trails and Boardwalks	
A Blind	
An Educator’s Action Guide.....	58
Find a Wetland to Study	
Some Field Trip Tips	
Student Checklist	
A Basic Wetland Sampling Kit	
Instructions for Making Simple Wetland Sampling Equipment.....	62
Deep Water Sampler	
Secchi Disk	
Plankton Samplers	
D-Net	
Plastic Bottle Dredge	

Algae Sampler	
Wire Basket Sampler	
Dip Net	
Underwater Viewer	
Miscellaneous Sampling or Study Supplies.....	67

## Part II: The Activities



<b>Section 1. So This Is a Wetland!</b> .....	70
<i>A series of activities designed to introduce general wetland concepts and definitions. These are good activities to choose from when beginning a wetland study unit.</i>	
Introducing Wetlands (K-12).....	71
<i>Fourteen fun activities to begin your wetlands study</i>	
Let the Cattail Out of the Bag! (K-6).....	78
<i>A grab bag of wetland “artifacts” to feel</i>	
Wetlands in the Classroom! (K-8).....	80
<i>Make a crafty cypress swamp display or set up a wetland aquarium/ terrarium</i>	
Wetland Metaphors (1-12).....	85
<i>Use metaphors of common objects to learn wetland values and functions</i>	
Wetland Habitats (6-12).....	87
<i>A flowchart key to types of wetlands</i>	



<b>Section 2: The Wetland Community (plants and animals)</b> .....	93
<i>A series of exercises and activities which will help students understand critical wetland issues like habitat niche, plant and animal adaptations, wetland delineation, plants’ role in filtering pollutants, identifying and classifying plants, and more.</i>	
Wetland Weirdos (4-12).....	94
<i>Adaptations to living in a wetland—study cattail and beaver</i>	
Wet ‘n’ Wild (K-12).....	99
<i>Collect and observe wetland and aquatic animals and make a field guide</i>	
Whose Clues? (K-12).....	104
<i>Find and observe signs of wildlife</i>	
Marsh Market (2-8).....	109
<i>Observe the workings of the food web</i>	
The Wetland Gourmet (K-12).....	112
<i>Recipes and information about edible wetland resources</i>	
Marsh Mystery (5-12).....	116
<i>Bioaccumulation of toxic substances</i>	

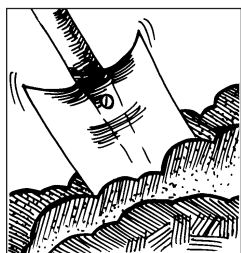
Treatment Plants (2-12).....	120
<i>Demonstration: how plants take up nutrients and pollutants</i>	
This Plant Key Is All Wet! (3-12).....	123
Kid Key Tree (3-6)—Students “classify” each other	
What Type of Plant Is It? (5-7+)—A dichotomous key to plant types	
Key to Emergent Plants (6-12)—A dichotomous key to some wetland plants	
Wetland Wheel (4-12).....	129
<i>Assemble a plant identification wheel</i>	
Tracking Plants and Keeping Track (5-12).....	138
<i>Use scientific techniques to sample plant species in a wetland; make an herbarium</i>	
Run for the Border (5-12).....	143
<i>Study physical features to find a wetland’s boundary</i>	
Wetland Address (5-10).....	147
<i>Identify wetland plants and animals with special clues</i>	
Life in the Fast Lane (3-8).....	152
<i>A scavenger hunt reveals organisms in temporary wetlands</i>	



**Section 3: Drip, Drop, Dribble, and Splash! (water).....** 157  
*Activities that relate to the role of water in the wetland picture. These include water related wetland functions, filtration experiments, demonstrations of erosion, and plant productivity.*

A Drop in the Bucket (6-8).....	158
<i>Estimate how much fresh water there really is</i>	
Soak It Up! (3-9).....	162
<i>Hands-on demonstration: how do wetlands get wet?</i>	
Salt Marsh Players (3-6).....	165
<i>Students act out how animals’ behaviors change with the tide</i>	
Water We Have Here? (2-12).....	174
<i>Study physical and chemical features of water—pH, temperature, salinity, dissolved oxygen, turbidity, rate of flow, nutrient content</i>	
Nutrients: Nutrition or Nuisance? (K-8).....	188
Part I: Musical Nutrients (1-4)—Musical chairs; effects of excess nutrients	
Part II: Wetlands—The Nutrient Trap (2-8)—Game; wetland plants filter the water	
Part III: We All Need Nutrients (K-2)—Active song	
Marsh Munchies (5-8).....	192
<i>Marsh productivity; energy needs</i>	
Recipe for Trouble (4-12).....	199
<i>Experiment: what happens when water has excess nutrients and pollutants?</i>	
Water Under Foot (4-12).....	204
<i>Demonstration: how wetlands, ground water, and pollutants affect each other</i>	

	Page
Runoff Race (2-12).....	210
<i>Demonstration: wetlands slow the flow of runoff</i>	
Wetland in a Pan (3-12).....	212
<i>Demonstration: filtering, erosion, and flood control functions</i>	
Water Purifiers (6-12).....	215
<i>Experiment: compare chemical and natural methods of filtering water</i>	
Over Hill and Dale (3-12).....	220
<i>Trace (on foot and with map) waterways feeding a wetland; track pollution sources</i>	



<b>Section 4: Going Down Under (soil)</b> .....	225
<i>Activities that explore the role of soils in a wetland environment, including filtration, percolation, and decomposition. Soil formation and characteristics also are studied.</i>	

Nature's Recyclers (K-6).....	226
<i>How is soil formed? What is in soil?</i>	
Do You Dig Wetland Soil? (K-12).....	231
<i>Study physical features of wetland soil; make and use a soil color chart</i>	
How Thirsty Is the Ground? (3-12).....	239
<i>Percolation tests of different soil types</i>	
A Rottin' Experiment (2-12).....	245
<i>Compare rates of decomposition in saturated and drier soil</i>	
Nature's Filter (K-3 as a demonstration, 4-12).....	250
<i>Wetland soil acts as a filter</i>	



<b>Section 5: Wetlands and People (culture and issues)</b> .....	252
<i>Activities that focus on the interactions between humans and wetlands. Contemporary social and political issues are considered, along with historic and cultural topics.</i>	

Hear Ye! Hear Ye! (3-12).....	253
<i>A play about a public hearing on a proposed building project in a wetland</i>	
Hydropoly! (4-12).....	260
<i>A board game of decision-making</i>	
People of the Bog (6-12).....	266
<i>Construct a bog and watch decomposition happen!</i>	
Regulation Rummy (9-12).....	270
<i>A nifty wetlands regulation card game</i>	
What a Boat! (1-5).....	278
<i>Build a boat with wetland reeds</i>	

	Page
Chrysti the Wordsmith on Wetlands (7-12).....	280
<i>A word game to find the derivation of wetland names</i>	
Wetland Tradeoffs (9-12).....	285
<i>Discuss the pros and cons of wetlands issues</i>	
Helping Wetland Habitats (K-12).....	288
<i>A variety of ideas, plans, and activities to help students take an active role in enhancing and restoring wetlands in their own communities</i>	
Get Involved! (K-12).....	310
<i>A series of activities for getting involved in wetland stewardship</i>	
Appendix.....	317
<i>Planning and Developing a Schoolyard Wetland Habitat, by Mark L. Kraus, Ph.D.</i>	
Glossary.....	320
Resources.....	326
<i>A listing of educational supplements (curriculum guides), books, films and videos, posters, organizations to contact for assistance</i>	
Correlation of WOW! Activities with National Science Education Standards.....	331
Activities by Subject Area.....	344
Activity and Topic Index.....	346

#### Index to Sidebars

Wetlands and the Big Picture.....	4
The Sweet Track and the Muskeg Express.....	6
Common Wetland Types.....	18
Wetlands Classification Chart.....	19
Peat and Heavy Metal.....	24
Peat Mines.....	28
Ancient Ancestors in Florida.....	30
Wetland Havens for Endangered Species.....	32
Emergents, Floaters, and Submergents.....	34
Gators and Gator Holes—A Boom and Bust Lifestyle.....	37
Beavers—Wetland Movers and Shakers.....	38
Energy Web—Freshwater Stream.....	39
Plant and Animal Ingenuity.....	40
History of Major Wetland Regulations in the United States.....	43
A Glimpse of the National Wetlands Regulation Maze.....	44
The “Takings” Issue.....	46
National Wetland Inventory Maps.....	54
The Section 404 Permitting Process.....	57
Interdisciplinary Approaches to Wetlands.....	58