



Some Basic Ecological Concepts

Everything has a home.

We call these homes habitats, ranges and ecological niches. Ecology (from the Greek “oidus” which means house) is the study of the common home of all life; the earth.

Everything is becoming something else.

All plants and animals undergo evolutionary changes and adaptations. When things die, they are broken down, decomposed, recycled and used by other living things.

Everything living thing eats and is eaten by something else.

Three categories of life forms are in the basic food cycle of life: producers, consumers and decomposers.

Everything depends on something else.

Interaction and interdependence occur among living and non-living things and their environment. A change in one strand of the food cycle of life affects the entire web. Nothing exists in isolation.

There are basic necessities for life:

Food, water, shelter, space. These necessities are found in the atmosphere (air), the hydrosphere (water) and the earth’s crust (soil). The biosphere is the thin skin of the planet where these zones collectively support life on earth.

Diversity is essential for life.

Many similarities and differences occur among living and non-living things. This variation is essential for maintaining a healthy community and ensuring that plants and animals survive and reproduce in spite of changing situations.

Humans are capable of changing the balance of nature.

We are rational, thinking beings that have changed and continue to alter the environment of the earth in many profound ways. As such, we have a responsibility to all living things.

(Used by permission from U.S. Fish & Wildlife Service **Salt Marsh Manual: an Educator’s Guide**).

Salmon Words: English to Spanish

Adult/Adulto - La edad de un animal o planta cuando esta capable de reproducir.

Anadromous - Un pez que migra del agua salado al agua fresca.

Egg/Huevo - Primer etapa del ciclo del Salmon.

Fertilization/Fertilizacion - El proceso de mezclar los huevos y el esperma para empezar la vida de un pez nuevo.

Fingerling - Un pececito, el tamaño de un dedo; un salmon menos de un año de edad.

Fry - Un pececito cuando sale del huevo hacia que tiene el tamaño de la mitad de un dedo.

Hatchery - El criadero de peces. Un lugar especial donde personas ayudan a los peces de producir y de crecer los peces jóvenes.

Life Cycle - Ciclo de la vida de un animal, pez o planta.

Migration/Migracion - Un viaje hecho por animales para encontrar comidas, para encontrar un lugar nuevo en que de vivir o para encontrar otros animales de su tipo.

Redd - Un nido hecho en los piedritos del fondo del río en que la hembra se pone los huevos.

Smolt - El parte de la vida del salmon cuando el cuerpo del salmon cambia para ser listo de viajar (migrar) y de vivir en el mar.

Spawn - Poniendo huevos y fertilizandolos.

Spawning (Salmon) - Una palabra usado de describar los salmones listos de poner huevos y fertilizantes.

Yolk Sac - El saco que contiene la yema del huevo. La yema es la comida del pececito desde sale del huevo al tamaño de la mitad de un dedo (se llama "fry").

Teacher Resources: Watershed Lesson Plans and Teaching Tools

Adopt-A-Watershed

Curriculum units are organized by grade level online. Each curriculum unit features projects, field study projects and community action materials. Call 1-530-628-5334 or visit: www.adopt-a-watershed.org

Rivers of Life, Center for Global Environmental Education

A full model for contextual learning; a flood of projects, adventures, and resources to help K-12 teachers and students learn about and from their watershed.

<http://cgee.hamline.edu/rivers/>

Online Classroom Projects, The Center for Improved Engineering and Science Education

The CIESE has several collaborative online classroom projects that allow students from around the world to compare the quality of their local waters. Projects include: Global Water Sampling Project, Down the Drain, Bucket Buddies, Take A Dip, etc.

<http://k12science.stevens-tech.edu/collabprojs.html>

A resource site for wetlands education, Ducks Unlimited

Activities about wetlands issues: plants, animals, ecosystems, water quality, weather and more. Lesson plans include art projects, worksheets, experiments and outdoors activities. www.greenwig.org/dueducator/alph_educator.html

Freshwater Wetlands Teaching Guide, Environmental Media Corp./Snyder Productions, Ltd

Freshwater Wetlands Teaching Guide contains six-programs, each 10 minutes long. Wetlands topics addressed include lakes, ponds, pools, marshes, forested wetlands, rivers, streams, floodplain communities and water use.

www.envmedia.com/guides/freshwater_wetlands.pdf

Office of Wetlands, Oceans and Watersheds, Environmental Protection Agency

Activities, projects, information magazines and curricula on wetlands, water resources, ecosystems, watersheds, wildlife and more. Links to educational resources produced by other organizations are also provided.

www.epa.gov/owow/wetlands/education

Watershed/NPS teaching tool, Protecting Our Watersheds, Non-Point Source Curriculum

Curriculum includes teacher guides, activity books, posters and tip cards. The watershed model demonstrates how water pollution comes from a variety of sources within the watershed landscape. www.enviroscapes.com

Global Rivers Environmental Education Network (GREEN)

This site provides resources and links for teachers seeking training in watershed education and watershed lesson plans. Information about identifying watershed problems, monitoring water quality, watershed science and water policy are explored.

www.green.org

American Wetlands Campaign: Educational Materials and Technical Assistance
Izaak Walton League. 1-800-BOG-IWLA or www.iwla.org/sos/awn

Hands-On Save Our Streams Curriculum
Izaak Walton League. www.iwla.org/sos

Map the Mississippi Watershed
Mississippi National River and Recreation Area, National Park Service
The Mississippi National River and Recreation Area has a variety of other activities related to the Mississippi River as well.
www.nps.gov/miss/programs/brj/resources.html for more information.
www.nps.gov/miss/programs/brj/brjactivities/mapping.html

The Fragile Fringe: A Guide for Teaching About Coastal Wetlands
National Wetlands Research Center.
www.nwrc.usgs.gov/fringe/ff_index.html

Access Nature and Nature Scope, National Wildlife Federation
Access Nature curriculum offers hands-on habitat based activities. *Nature Scope* features 15 hands-on activities covering habitat basics, plant growth, soil, food webs, biodiversity, and habitat loss.
www.nwf.org/schoolyardhabitats/natureactivities.cfm

North American Association for Environmental Education
This website provides links to lesson plans and educator guides which have been suggested and evaluated by other educators.
www.eelink.net

United States Department of Agriculture
This website features links to wetlands information for middle and high school students produced by USDA. Links to education programs used in other states and programs produced by the EPA are also available.
www.ct.nrcs.usda.gov/educators.htm

National Wetlands Inventory, U.S. Fish and Wildlife Service
This site provides resources and additional links for teachers on many environmental issues. It also has links to fun and educational online activities for kids.
www.nwi.fws.gov/educator.htm

Water Education Posters, USGS Water Resources Outreach Program
Topics include wetlands, water use, wastewater, navigation, groundwater, and water quality. The reverse sides of the color posters contain educational activities: one version for children in grades 3-5 and the other with activities for children in grades 6-8. The black-and-white posters are intended for coloring by children in grades K-5. Call 1-888-ASK-USGS or visit: <http://water.usgs.gov/outreach/OutReach.html>

Give Water A Hand, Wisconsin State University Extension Service
The guides present plans to organize and execute action oriented projects to address water quality issues in your community. 1-800-WATER 20 or
www.uwex.edu/erc/ey paw

Yahara Watershed Education Network

The Yahara Watershed Education Network is an informal umbrella for K-16 educational activities that focus on local issues using "watershed" and "ecosystem health" as integrating concepts; it is a collaborative effort of Edgewood College, the University of Wisconsin-Madison, the Wisconsin Department of Natural Resources, local teachers and school districts, their students, and other interested educators.

<http://danenet.wicip.org/ywen/index.html>

Workshops

Project Food, Land, & People

Project Food, Land & People promotes approaches to learning to help people better understand the interrelationships among agriculture, the environment and people.

www.foodlandpeople.org/

Project Learning Tree (PLT)

PLT uses the forest as a "window" on the world to increase students' understanding of our environment; stimulate students' critical and creative thinking; develop students' ability to make informed decisions on environmental issues; and instill in students the commitment to take responsible action on behalf of the environment.

[Www.plt.org/](http://www.plt.org/)

Project WET (Water Education for Teachers)

Project WET is an international, interdisciplinary, water education program for formal and nonformal educators of students 5 to 18. www.projectwet.org

Project WILD and Project Aquatic WILD

The projects described fuse national subject area standards with environmental issues. Each project is classified according to major subject area addressed, ecological principals explored, activity time and objectives.

www.projectwild.org/framework/intro.htm

POW!: The Planning of Wetlands, Environmental Concern Inc. and The Watercourse

POW!: The Planning of Wetlands, is designed to guide educators and students in the creation, restoration and enhancement of wetlands in or near schoolyards using natural and/ or artificial water sources. A POW! Guide is also available, which covers the information discussed at the workshop.

www.wetland.org/educ_pow.htm

WOW!: The Wonder of Wetlands, Environmental Concern Inc. and The Watercourse

WOW!: The Wonder of Wetlands, provides creative and resourceful activities, information and ideas about wetlands. A WOW! guide is also available, which covers the information discussed at the workshop. www.wetland.org/wowteacher.html

Books

Bones, D., ed. 1994. Getting Started: A Guide to Bringing Environmental Education into Your Classroom. National Consortium for Environmental Education and Training. Ann Arbor, MI.

Breckenridge, J., A.D. Fredericks, L.V. Loeschmig, and M. Mandell. 1998. 365 More Simple Science Experiments with Everyday Materials. Black Dog & Levanthal Publishers. New York, NY.

Churchill, E.R., L.V. Loeschmig, and M. Mandell. 1997. 365 Simple Science Experiments with Everyday Materials. Black Dog & Levanthal Publishers. New York, NY.

NAAEE. 1996. Environmental Education Materials: Guidelines for Excellence. North American Association for Environmental Education. Troy, OH.

The GLOBE Program. 1997. GLOBE Program Teacher's Guide. Global Learning and Observations to Benefit the Environment, Washington, DC.

Nasikelt River Discovery Program

Education Boxes and Workshops

U.S. Forest Service and U.S. Fish & Wildlife Service

The following education boxes are available to area teachers for a two-week checkout. Make your reservations for these popular boxes at least one month in advance by calling Susan Thomas 548-6977 ext. 237 or Susan Blair at 548-6662 ext. 226.

- *Wolf Discovery Box* (K-12) This box provides an excellent way for students to learn about these mammals that live in our region. Materials include: wolf and coyote hides, skulls, tracks and scat. Box also contains a cassette of wolf howls, videos, reference books and a curriculum guide.
- *Bear Discovery Box* (K-12) Grab your students' attention with this box featuring grizzly and black bear pelts, skulls, tracks, claws, videos, posters, cub puppet, and silhouettes to aid in species identification. The teacher's guide contains activities like "build-a-bear felt board" and tips for bear-safe camping. Popular with scouting groups in our area.
- *Water Bug Discovery Box* (K-12) This box enables you to prepare and guide your students into learning about and examining life above and below the water line. Box includes a curriculum guide, books, posters, videos, relief maps, wader and kick nets and water quality test kits to use in the field.
- *Swauk Forest Discovery Box* (7-12) Designed to be used in conjunction with a Wenatchee National Forest interpretive trail. This box includes: a curriculum guide, a 3-part narrated slide show, and materials to do a series of hands-on activities about disease, fire, forest succession and habitats of Washington State. Comes with backpacks filled with field equipment and activities to do on the trail.
- *Fire Discovery Box* (4-12) This box focuses upon the role of fire in our forest ecosystem. It includes videos, a curriculum with activities, samples of fire-scarred tree wedges and books. This is an excellent way to learn how fire plays a vital and beneficial role in our forests.
- "*Fire in the Pacific Northwest Ecosystem Kit*" (4-12) This box includes slides, video, curriculum and cd's. This kit compliments the Fire Discovery Box.
- *The Fin Bin* (K-12) This popular Leavenworth National Fish Hatchery box is also available at the North Central Washington Museum. These materials assist you in teaching about the aquatic world and specifically about salmon. Bin includes an activity guide, water test kits, posters, fish models, videos and specimens.
- *Plant Discovery Box* (3-12) Teach students about the rich plant life of the eastside Cascades. Based around the new *Celebrating Wildflowers* curriculum, the box contains curriculum, posters, field guides, models, a PBS video series with a teacher guide, books about plants, hands-on activities & a slide show, *Plants for People*, with lessons to do pre- and post-viewing.

- *Mrs. Johnson Water History Box* (3-12) The resource box enables educators to teach about water history through the eyes of a real pioneer woman, Mrs. Johnson. The kit includes Mrs. Johnson's costume, script, and artifacts including a divining rod, clothes wringer, and a Sears's catalogue.
- *The Enviroscope Model* (3-12) A three-dimensional model simulates a typical populated watershed. It is designed to teach students how we all can be part of the solution rather than part of the problem of environmental degradation. Concepts included in this model are land management practices as they relate to point and non point source pollution and water runoff.
- *The Groundwater Model* (3-12) This interactive model depicts the way water moves underground through different soil particles. Students create pollution scenarios and track how they relate and affect drinking water.

WORKSHOP OPPORTUNITIES

Education specialists Susan Thomas, Leavenworth Ranger District, U.S. Forest Service and Susan Blair, Leavenworth National Fish Hatchery, U.S. Fish & Wildlife Service, offer the following workshops for area teachers. Clock hours and/or credit are available for all workshops. Check each box below if you want to receive mailings.

√ **Check areas of interest**

- *National Project WET* (K-12) An integrated curriculum of 91 activities that explores the study of water by embracing science, history, culture and wonder. The 500 page guidebook features multiple indices, offers assessment strategies and succinct teacher background information given for each science concept. Activities utilize the *Water History Box* and the *Enviroscope* and *Groundwater* models.
- *Forests of Washington* (4-9) Educators are invited into the forest to learn first-hand about the complex web of interrelationships within Washington's forests. Participants receive a curriculum guide, video and poster.
- *Project WILD* (K-12) Take to the air or to the land to teach ecological principles and to examine the diversity of life. Nationally acclaimed, this is a newly revised curriculum containing over 100 interdisciplinary activities you can use to help students learn to make informed decisions.
- *Project WILD-AQUATIC* (K-12) Come learn about the aquatic environment and the animals and plants that live there. Students are introduced to the principles behind management and conservation and they learn analytical skills needed to evaluate issues. This nationally acclaimed curriculum is indexed and contains over 100 activities. Participants also get a peek into the U.S.F.S. *Water Bug Discovery Box* and the U.S.F.W. *Fin Bin*, both of which supplement this curriculum.

- *Project Learning Tree, or "PLT"* (K-12) This hands-on, interdisciplinary curriculum provides opportunities to investigate the forest web of life. Activities also help students learn how to think about local and global issues and offer skills that enable them to make informed decisions. Widely used in Washington, the curriculum includes 96 indexed activities. PLT's popularity dates back to the mid '70s and the newly revised version are in great demand too.

Additional workshops include:

- *WILD About Elk*
- *Fire in the Pacific Northwest Ecosystem*
- *Tips and Tricks of Teaching* (for "ologists")
- *Watershed Education*
- *Project Learning Tree Secondary Modules*
- 12 or more teachers in my school are interested: we'd like to arrange an on-site workshop.

A SAMPLING OF MORE EDUCATION PROGRAMS:

- *Kids in the Creek* (watershed program for high school students)
- *Watershed Watchers* (watershed program for middle school students)
- *Winter Life Snowshoe Tours* (winter ecology field tours; by reservation only)
- *Wenatchee River Salmon Festival* (two days for 3rd/4th graders, two days for families)
- *Salmon Hatchery Tours* (by reservation only)

Your Name _____ School _____

Address _____

Grade _____ Phone _____

I'd like to get a group of 12+ together for a _____ workshop.

I'm interested in learning more about the _____ education kit or program.

Mail this form to: Nasikelt River Discovery Program
 12790 Fish Hatchery Road
 Leavenworth, WA 98826

Or call: (509) 548-6662