



Spring 2002

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NORTHERN WOODLANDS MAGAZINE

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www.northernwoodlands.com

Editorial Mission

To inspire landowners' sense of stewardship by increasing their awareness of natural history and the principles of conservation and forestry that are directly related to their land.

To encourage loggers, foresters and purchasers of raw materials to continually improve the standards by which they utilize the forest's resources.

To increase the public's awareness and appreciation of the social, economic and environmental benefits of a working forest.

To raise the level of discussion about environmental and natural resource issues.

To educate a new generation of forest stewards.

Please allow your students to keep their copy of each edition of the magazine, and encourage them to share what they have learned with their families.

Teacher's Guide

A Note to Teachers

Welcome to the Spring 2002 edition of *Northern Woodlands*. Sap's running, birds are singing, buds are bursting, and your students are itching to get out into the spring warmth. This issue of *Northern Woodlands* is filled with articles about woodland plants and animals—from salamanders to liverworts—that will entice you and your students into the woods to explore the unfolding of spring. You'll also find articles covering important current events affecting the Northern Forest community that will spark lively classroom discussion.

This teacher's guide serves as a companion to *Northern Woodlands* magazine. In it are several in-class and outdoor activities that expand upon ideas presented in some of the magazine's articles. For each activity, we offer recommendations of related publications, contacts, and websites, as well as Project WILD and Project Learning Tree activities that build upon each activity theme. We also indicate the state curriculum standards each activity fulfills.

We'd like to extend special thanks to the sponsors of this project. As a result of their support, over 5,000 students throughout the Northeast receive four issues of *Northern Woodlands* each school year. The sponsors are: Vermont Department of Forests, Parks and Recreation; USDA Forest Service State and Private Forestry; Maine TREE Foundation; Freeman Foundation; Mill River Lumber; Forest Resources Association; Mascoma Savings Bank; Merchants Bank; Ledyard National Bank; Wells River Savings Bank; several members of the Maine Forest Products Council; and a number of individuals.

We would love to know your thoughts about our teacher's guide. If you have comments or suggestions, or if you need more (or less) copies of the magazine for your students or would like additional copies of this guide, just call or e-mail Ghostwriters Communications at 802-287-4284 (e-mail: tharvey@gwriters.com). Visit our *Northern Woodlands* Goes To School website at www.northernwoodlands.com/goestoschool.html.

Noteworthy News:

Calling all student scientists! Starting with this issue, the *Northern Woodlands* website, www.northernwoodlands.com, will feature a Student Projects page, where we'll publish students' scientific projects and other forest-related endeavors. Encourage your students to dig into a science project, write up their findings, and send them to us, along with a photo or two, if possible. For information about how to submit materials, see the Student Projects page or call Sue Kashanski or Catherine Tudish at *Northern Woodlands*, 802-439-6292.

New science curricula e-newsletter: The National Science Teachers Association (NSTA) and Learning Network have teamed up to produce a monthly e-mail newsletter called Science Monthly. The theme-based newsletter is geared for K-12 educators and provides activities, lesson plans, and resources for science instruction. Upcoming topics include nutrition, classroom safety, careers in science, soil, Earth Day, and the summer solstice. www.teachervision.com/tv/lounge/newsletter/science-signup.html.



The Framework identifies fields of knowledge considered necessary in the public school curricula of Maine, New Hampshire, and Vermont.



Project WILD is a national conservation education program designed to prepare students to make decisions affecting people, wildlife, and their shared home, Earth. Project WILD is administered by your state's fish and wildlife department.



Project Learning Tree (PLT) is a program of the American Forest Foundation and the Council for Environmental Education. PLT provides a series of educational activities focused around forests and forest issues. Contact your state forester's office for more information on PLT activities.



Websites are increasingly critical as a research tool. The Teacher's Guide includes web addresses that we hope will help to increase your students' learning opportunities.





Suggested books and readings are also included in the Teacher's Guide to help teachers and students get the most benefit from each edition of the magazine. These references focus on enhancing the concepts featured in the activities.



Where applicable, the Teacher's Guide offers helpful information or resources to supplement activities.

Suggested Activities

-  Science 1a, 2a
-  3.7 Informed Decisions
- 3.9 Sustainability
- 7.1 Scientific Method
- 7.2 Investigation

1. Understanding Amphibians (field study)

The Salamander Zone (page 44)

A small scientific study can have big implications. If your students were forest managers or could establish forest management practices, what practices would this study lead them to create? Have your students work in teams to draft management recommendations to share with the rest of the class.

The Terrestrial Salamander Monitoring Program, run by the USGS Patuxent Wildlife Research Center, is seeking volunteers to monitor salamander transects. Set up a transect with your students, and add your data to a national, on-line database.

The Vermont Institute of Natural Science (VINS) coordinates several "Citizen Science" programs, in which volunteers monitor wildlife populations and record data. They are currently conducting two amphibian research projects with which you and your students could become involved: The Vermont Calling Frog Survey and the Amphibian and Reptile Inventory

of Marsh-Billings-Rockefeller National Historical Park.



The USGS's Terrestrial Salamander Monitoring Program, www.im.nbs.gov/sally.

Vermont Institute of Natural Science, www.vinsweb.org. For information about the Citizen Science program, contact Dan Lambert, 802-457-2779 ext. 132.



Mark McCollough
www.state.me.us/ifw/wildlife/01report

Maine Stream Team Program
www.state.me.us/dep/blwq.doc/stream



400-Acre Wood Watch on Wetlands Adopt-a-Forest, *Forest Ecology High School Module* Cast of Thousands, *Forest Ecology High School Module*



Wildlife Research



Science and Technology B, J

2. The Hidden Costs of Free Trade (Current Events)

Cheap Wood Imports Threaten Local Industry, by Mikael Batten (page 75)

"We need to understand that everything we consume comes at an environmental and human cost, no matter where it is produced," writes Mikael Batten. What do NAFTA and GATT and other free trade initiatives have to do with the Northern Forest and your students? This article offers the opportunity to explore the environmental and social impacts of a global economy.

Have students generate a list of wood products-related businesses in your community. Have students work in pairs to choose one of these businesses and generate questions that help define the business (how many employees, what does the company make/do, where do they sell their products), the impact (or lack thereof) of free trade upon its business, and how it can/does insulate itself from those impacts. Have students interview the business manager, then compare results with the rest of the class. The results may offer insights into the kinds of wood products businesses most vulnerable to foreign competition.

Why buy locally made products? What difference does it make if paper is produced in Indonesia rather than New Hampshire? What are the environmental and social costs involved? Have students read Wendell Berry's essay, "Conserving Communities," then contemplate and brainstorm answers to these questions. What initiatives can they envision to encourage a more place-based economy that might fit for your community? Their thoughts could take the form of a written report, a proposal to the town council, or a letter to the editor.



Another Turn of the Crank, by Wendell Berry, particularly the essay, "Conserving Communities," pp. 8-24. Counterpoint Press: New York, 1996.

The Vermont Wood Manufacturers Association offers a free brochure about the economic benefits of wood manufacturing in the Northern Forest. 802-287-4284.



Maine Forest Products Council
www.maine-forest.com
The Forests of Maine
www.mainetreefoundation.org

CAREER

CONNECTION

Following Your Bliss

At Work Analyzing Scat with Tracker Paul Rezendes, by Mike Eckel (page 32)

Rezendes' story is a prime example of what can happen when, to use the words of Joseph Campbell, you "follow your bliss." Rezendes' "career path" was rocky and circuitous, but he eventually recognized the work that sparked his passion and joy, and continues to ride the wave of that bliss. Psychologist Howard Gardner describes nine "intelligences" in his theory of multiple intelligences (see website below). Ask your students to consider these ways of knowing and where their own learning strengths lie. Have them generate a list of the things they really like to do and under which intelligence each would fall. Then ask them to consider the question: If they could do anything at all during their life, what would they do? In the spirit of multiple intelligences, let them convey this in the form best suited to them: essay, artwork, music, performance.



Multiple Intelligences in the Classroom, by Thomas Armstrong. Published by the Association for Supervision and Curriculum Development. Describes how educators can bring Howard Gardner's theory of multiple intelligences into the classroom every day. For ordering information: www.ascd.org.



The Disney Learning Partnership offers a good introduction to multiple intelligence theory and practice,

<http://www.thirteen.org/edonline/concept2class/month1/>.



Who Works in this Forest?



Career Preparation A
English Language Arts E




English Language Arts 2




1.12 Essay Writing
3.15 Career Choices
3.2 Learning Strategies
3.3 Respect


Suggested Activities


 http://www.issues2000.org/Background_Free_Trade.htm for background on free trade.

www.vermontwood.org for a list of wood manufacturers in Vermont.


www.mainewood.org for a list of wood manufacturers in ME.

 Resource-Go-Round
Our Changing World
Tree Treasures

 Sustainability: Then, Now, Later
Appendix—Guidelines for Interviewing People

 English Language Arts E
Geography B
Economics A

 English 1, 2, 5
Social Studies 5

 1.5 Writing Dimensions
1.19 Research
2.1 Types of Questions
2.2 Problem-Solving Process
3.9 Sustainability
4.6 Understanding Place
7.16 Natural Resources

3. Contemplating Caterpillars (field study)

Caterpillars: The Sound and the Fury (page 44) and *Eastern Tent Caterpillar, Malacosoma americanum* (page 59)


Caterpillars make for fascinating research, both in the class and in the field.

High school students can take part in Monarch Watch (created by the Department of Entomology at the University of Kansas), a continent-wide research network of schools involved in monitoring and tagging monarchs. Participants receive tagging kits and monitoring instructions, and enter their observations into a database used by scientists to study migration. (Also have students read “A Place in Mind,” page 76, to add depth to this activity.)


For elementary and middle school children, try raising monarch butterfly caterpillars in the classroom. The Monarchs in the Classroom program, created by the Department of Ecology at the University of Minnesota, offers extensive curricula. Because they do not ship larvae to the East Coast, order your larvae from Monarch



Watch www.monarchwatch.org. (\$32/monarch rearing kit, containing 16 larvae and instructions).


 *Green Teacher*, Winter 2000
“Meet the Monarch!” pp. 12-17.
An excellent guide to studying monarchs in the classroom.


Handbook of Nature Study, by Anna Botsford Comstock. “Insects of the Fields and Woods,” pp. 301-329. Cornell University Press: Ithaca and London. 1911 (reprint: 1986). Comstock’s book is a natural history classic, and her suggestions for teaching about common moths and butterflies are timeless.


 The Vermont Institute of Natural Science (VINS) coordinates Vermont’s participation in the University of Minnesota’s Monarch Larval Monitoring Project. Teachers from other states should contact the University program directly. www.vinsweb.org

UMN’s Monarchs in the Classroom has a superb website, www.monarchlab.umn.edu. Or contact Karen Oberhauser 612-624-8706, oberh001@tc.umn.edu

www.earthsbirthday.com. The website of the Earth’s Birthday Project. This site offers “A Guide to the Magical World of Butterflies” and other insect curricula for elementary and middle school students.

 Migration Barriers

 Science and Technology B

 Science 1a, 2a

 7.1 Scientific Method
7.3 Investigation


WILDLIFE


CONNECTION

Building Habitat

Build a Wasp/Bee House (page 15)

Make your school grounds a haven for wildlife, especially beleaguered wild bee populations. Bee houses are simple to construct, and this article tells you how. But don’t stop there: Bluebird houses are simple too, and bat houses as well. Or plant a butterfly garden—the bees will thrive there, too. There’s no limit to the possibilities for creating homes for wildlife and observing the results.

 *Stokes Birdhouse Book: The Complete Guide to Attracting Nesting Birds*, by Donald and Lillian Stokes. Little Brown & Co., 1990.

 Bat Conservation International offers simple bat house plans that bats will actually nest in (unlike many other kits and plans) www.batcon.org/bhra/economyhouse.html.

The North American Bluebird Society is a non-profit conservation group that promotes recovery of bluebirds and other native, cavity-nesting bird species. Their website offers many nest box plans.


<http://www.nabluebirdsociety.org/>.

www.nwf.org/schoolyardhabitats, for information about planting habitat for wildlife


 School Yard Safari

 Ecosystem Facelift

 Improving Wildlife Habitat in the Community

 Physical Education B
Science and Technology B

 Science 3b

 4.1 Service
7.13 Organisms, Evolution, and Interdependence

Suggested Activities

4. If I were in charge... (current events)

Champion Retires, Chaos Reigns, by Catherine Tudish (page 34)

<http://www.state.vt.us/anr/fpr/lands/champion/>

How would your students divvy up and manage the 132,000 acres of Champion lands? How would they balance the interests involved? Have students identify the players in the debate—from the wood products community to hikers, snowmobilers to ecologists—and consider their perspectives. Ask them to come up with their own management proposal and supporting rationale.

Or have students write and act out a play about debate among the many constituents involved. Encourage their creativity. They could write it from the perspective of the wild inhabitants of the land, use humor or satire—whatever techniques will deliver their message best.



The Great Remembering, by Peter Forbes. The Trust for Public Land, 2001. (reviewed page 64)

For older students and teachers, an excellent resource for learning about group processing and decision making is *Making Collaboration Work: Lessons from Innovation in Natural Resource Management*, by Julia M. Wondolleck and Steven L. Yaffee. Island Press: Washington, DC, 2000.



www.manometmaine.com. Offers The Shifting Mosaic, a research project established to study ecological and economic influences within the forests of Maine.



400-Acre Wood We Can Work It Out Tough Choices, *Focus on Forests* High School Module



Planning for People and Wildlife Sustainability: Then, Now, Later



Civics and Government A
Geography B
Economics A
Visual and Performing Arts A



Social Studies 4
English Language Arts 5, 6



2.1 Problem Solving
4.6 Understanding of Place
6.3 Meaning of Citizenship
6.14 Forces of Unity and Disunity
6.18 Nature of Conflict
5.3 Artistic Process

5. Peer Researchers (field study)

New Hampshire River Flexes Its Muscles (page 45)

- This article will show your students where a classroom project can lead—from hypothesis to research to analysis to published results. Let them know that *Northern Woodlands* now offers a page on their website for student research projects (see **Noteworthy News**).
- Stream monitoring offers wonderful research opportunities. The EPA offers extensive literature on water monitoring, including an excellent National Directory of Volunteer Monitoring Programs, in which you can find out the volunteer opportunities for water monitoring in your state.



EPA's National Directory of Volunteer Monitoring Programs, <http://yosemite.epa.gov/water/volmon.nsf>.



Field, Forest, and Stream Watch on Wetlands



Riparian Zone



English Language Arts H
Science and Technology B



Science 1a, 2a



1.8 Reports
7.1 Scientific Method
7.2 Investigation

6. A Closer Look at Bryophytes (field study)

A Moss and Liverwort Primer, by Roger Monthey, Marilyn Mollicone, and Kenneth R. Dudzik (page 28)

- Prior to reading this article, conduct a quick survey of your students' moss and liverwort knowledge. What are mosses and liverworts? Where do they live? How many varieties have your students noticed? Most of us know very little about mosses and even less about liverworts. When they're done reading the article, take the students for a moss and liverwort tour. Bring the article's handy pictures and descriptions along, as well as plenty of hand lenses (10-power), and have students see how many mosses and liverworts they can identify.
- Take advantage of these glorious, unfolding days of spring and conduct an ongoing plant study. Have students plot out transects around the school grounds and monitor the plant life within each transect, noting the dates of leaf and flower emergence.



DiscoverySchool.com offers many science curricula, including one on looking for biodiversity, with a good description of how to create study plots and transects. <http://school.discovery.com/lesson-plans/programs/biodiversity/>.



Adopt-a-Forest, *Forest Ecology* High School Module



Cast of Thousands, *Forest Ecology* High School Module



Science and Technology A, B



Science 1a, 2a

7.1 Scientific Method
7.2 Investigation

CALENDAR

CONNECTION

Stalking the Wild Salad

Calendar (page 4) and *Spring Leeks Out* (page 14)

How about a salad of dandelion and plantain leaves or a sauté of fiddleheads, wild leeks, and tender cattail shoots? Take your students on a wild edibles walk. Invite a local botanist or herbalist to accompany you to ensure accurate identification. Your students will easily remember plant identifications when there's a taste attached!



Stalking the Wild Asparagus, by Euell Gibbons. Alan C. Hood: Putney, Vermont. 1962.



The Maine Cooperative Extension provides recipes and facts about edible wild greens, <http://www.umext.maine.edu/onlinepubs/htmlpubs/4060.htm>.



Pass the Plants, Please



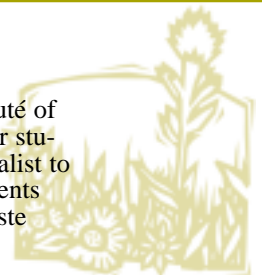
Science and Technology A



Science 3a



4.6 Understanding Place
7.2 Investigation



Word Search

Calendar (page 4)

Wind direction that produces the best maple sap runs.

Month when smelt start their upstream run.

This woodpecker species takes 20 days to excavate a nest.

The ovenbird is an example of this kind of bird.

The pollen of this early-blooming tree provides the first spring food for many bees.

Bird that eats the petals of apple blossoms (two words).

Animal that excavates tunnels in your lawn while looking for grubs to eat.

Where white pine weevils spend the winter.

This bird nests in old red-tailed hawk nests (three words).

The first day of spring (two words).

What hooded mergansers like to eat.

Month during which red-tailed hawks return to the Northern Forest from their southern wintering grounds.

Y N W O D F K H M Y W H A E R G
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 B D O W A O D E C E Q U I U Q E

Word Search

Calendar (page 4)

Wind direction that produces the best maple sap runs. **Northwest**

Month when smelt start their upstream run. **May**

This woodpecker species takes 20 days to excavate a nest. **Downy**

The ovenbird is an example of this kind of bird. **Warbler**

The pollen of this early-blooming tree provides the first spring food for many bees. **Willow**

Bird that eats the petals of apple blossoms (two words). **Cedar waxwing**

Animal that excavates tunnels in your lawn while looking for grubs to eat. **Mole**

Where white pine weevils spend the winter. **Soil**

This bird nests in old red-tailed hawk nests (three words). **Great Horned Owl**

The first day of spring (two words). **Vernal Equinox**

What hooded mergansers like to eat. **Fish**

Month during which red-tailed hawks return to the Northern Forest from their southern wintering grounds. **March**

Y	N	W	O	D	F	K	H	M	Y	W	H	A	E	R	G
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