Northern Woodlands

Winter, 2003

Too many magazines? If you are receiving more copies of *Northern Woodlands* than you need or want, please let us know. There are teachers and kids on the waiting list to join Northern Woodlands Goes to School who would really appreciate your extras! Contact Anne Margolis at anne@northernwoodlands.org or 802-439-6292.

Looking for an article? A complete index of the past five years' worth of *Northern Woodlands* is available at http://www.northernwoodlands.org/nw_index.html; we would be happy to make a photocopy of an article you need and mail it to you.

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Northern Woodlands Magazine

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Editorial Mission

To shape the future of the forests of the Northeast through information and education about their value, use, and conservation.

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

Northern Woodlands Goes to School

Welcome to the Winter 2003 edition of *Northern Woodlands* magazine. It's cold and snowy outside, but that doesn't mean you and your students need to stay indoors. Winter is the perfect time to study birds and tree buds and to learn the art of animal tracking. This edition of *Northern Woodlands* offers articles on these subjects and many others that will have your students itching to explore their winter world.

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 5000 students throughout the Northeast receive three issues of *Northern Woodlands* each school year. The sponsors are: the Alexander Host Foundation, Britton Lumber Company, Cersosimo Lumber Company, Inc., Columbia Forest Products, Fountain Forestry, Inc., Freeman Foundation, French Foundation, International Paper, Maine TREE Foundation, Mill River Lumber, Northeast Lumber Manufacturers Assoc., Pompanoosuc Mills, and Wellborn Ecology Fund.

We would love to know your thoughts about our teacher's guide. If you have comments or suggestions, or if you need more (or fewer) copies of the magazine for your students or would like additional copies of this guide, just call or email Anne Margolis at (802) 439-6292 (email: anne@northernwoodlands.org). Visit our *Northern Woodlands Goes to School* website at www.northernwoodlands.org/goestoschool.html.

Noteworthy News:

The Freeman Foundation, *Northern Woodlands*, and the Vermont Leadership Center (VLC) have teamed up to sponsor a three-part teacher workshop series providing the knowledge, skills, and training necessary to develop standards-based lessons focused on Northern Forest Ecology. Workshops are free and run from 9 a.m. to 4 p.m. at the VLC; teachers may register for one or more workshops, which involve both indoor and outdoor sessions. On January 29th, 2004, the second in the series of three workshops will be held, focusing on Winter Ecology and Tracking. For more information or to register, contact Annie or Jason Brueck at (802) 723-6551.

The State University of New York at Oswego hosts an excellent site, *The Winter Science Curriculum Project*, http://www.oswego.edu/wscp for middle school, high school, and AP biology teachers. You'll find 49 lesson plans for studying plants and animals in winter – everything from winter photosynthesis in coniferous trees to winter aquatics. Several lesson plans come with in-depth background materials for teachers.

PBS has created an online teacher resource called *American Field Guide*, with curricula designed for middle and high school students. On this site, you'll find lesson plans that weave segments of video together into units of inquiry around topics ranging from fire ecology to ocean habitats. High school teachers wrote all the lesson plans, which draw upon national and state standards for science learning. http://www.pbs.org/americanfieldguide/teachers/index.html.

In this issue of *Northern Woodlands*, Reeve Lindbergh reviews Stephen R. Swinburne's new book, written for upper elementary school students. *The Woods Scientist* celebrates the passionate work of Susan Morse, a wildlife biologist in Jericho, Vermont, and is accompanied by Morse's stunning wildlife photographs.

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

1. Trees in Winter (field study/classroom study)

"Winter Buds," excerpted from *The Winter World* by Bernd Heinrich (page 54)

Take your class on a tour of the school grounds to look at tree buds in winter. How many different kinds do you see? Can your students identify them? While you can invite a local forester or naturalist to accompany you to help with identification, you can also have your students key out trees on their own by carefully examining bud placement and characteristics, twigs, bark, fruits, and residual foliage. See if your findings support Heinrich's statement that native tree species have much larger buds than those of species introduced from the south.

Have students begin a journaling project, selecting a tree to study throughout the winter and spring. Ask them to draw its general form and the details of its parts—twigs, buds, fruit, and bark. They can then clip a small branch from the tree to place in water in the classroom (see Heinrich's article for information about "forcing" tree branches). Students can then study the tree's leafing and flowering both inside and outdoors. Have them draw the unfolding buds and examine what they find.

The Tree Identification Book, by George Symonds. William Morrow Publishing: 1973.

Winter Tree Finder, by May T. Watts. Nature Study Guild: 1970.

Check out SUNY/Oswego's site, The Winter Science Curriculum Project (described in Noteworthy News) http://www.oswego.edu/wscp. It offers three excellent lesson plans for teaching middle and high school students about winter tree identification.

IPLT Bursting Buds

The Closer You Look

ME Science and Technology J
Visual and Performing Arts A
English Language Arts

NH Science 1a, 2a
English Language Arts 2

VT 1.12 Personal Essays
4.6 Understanding Place
5.29 Visual Arts
7.1 Scientific Method
7.2 Investigation

2. Winter is for the Birds (field study)

The Birds of Winter (page 14)

Conduct a winter bird count on your school grounds or take part in a local winter bird count. Most local Audubon chapters conduct a bird count in mid-December, known as the Christmas bird count. They're also a great resource for volunteer birders who can assist in your school grounds bird count.

Set up bird feeders on your school grounds, and use them to study winter bird ecology. The Audubon Society book reference below offers many feeder suggestions for attracting a variety of birds.

Get involved in Project FeederWatch. This program is a winter-long survey of birds that visit feeders at backyards, nature centers, community areas, and other locales in North America. FeederWatchers periodically count the highest numbers of each species they see at their feeders from November through early April. FeederWatch helps scientists track broadscale movements of winter bird populations and long-term trends in bird distribution and abundance. Project FeederWatch is operated by the Cornell Lab of Ornithology in partnership with the National Audubon Society, Bird Studies Canada, and Canadian Nature Federation.

North American Birdfeeder Handbook: The complete guide to feeding and observing birds, by Robert Burton. Dorling Kindersley Publishing Inc.: New York. 1995.

Once again, SUNY/Oswego's site, *The Winter Science Curriculum Project* (described in Noteworthy News) http://www.oswego.edu/wscp/dt.htm has lesson plans perfectly suited to the subject. For high school and AP biology students, try *Seed Preferences of Winter Birds.* Bird Natural History at the Winter Feeder offers a field study curriculum for middle and high school students.

National Audubon Society's website offers links to state chapters for New York, Vermont, and Maine, www.audubon.org. New Hampshire Audubon Society is independent of the national organization – their website is www.nhaudubon.org.

Project FeederWatch. http://birds.cornell.edu/pfw/Overview/over_index.html.

Bird Song Survey

CALENDAR CONNECTION

Winter Calendar (page 4)

As the *Northern Woodlands* winter calendar notes, seed and plant catalogs are being mailed out now. It's a great time to plan a spring garden for the school. You can create a garden that offers food and habitat for animals; you can also design a garden to grow food for the school.

For more immediate habitat improvement, hang bird feeders (see "Winter is for the Birds" activity). Tie old Christmas trees together in a teepee near schoolyard bird feeders to serve as shelter.

The Bird Garden: A comprehensive guide to attracting birds to your backyard throughout the year, by Stephen W. Kress. Dorling Kindersley Publishing, Inc.: New York. 1995.

The National Wildlife Federation's Backyard Habitats program offers many resources for improving your school's wildlife habitat. You can even turn your schoolyard into a certified Schoolyard Habitats site. http://www.nwf.org/schoolyard-habitats/.

The Center for EcoLiteracy offers several publications for sale on growing school gardens, including *The Edible Schoolyard* and *Getting Started: A Guide for Creating School Gardens as Outdoor Classrooms*. http://www.ecoliteracy.org/pages/publications.html.

IPLT Plant a Tree

Improving Wildlife Habitat in the Community
Planning for People and Wildlife

ME Science and Technology B, J

NH Science 3a

VT 2.13 Product/Service
2.14 Planning/Organization

Suggested Activities

ME Science and Technology J

NH Science 1a, 2a, 3a

VT 4.6 Understanding Place
7.1 Scientific Method
7.2 Investigation

3. Fishers on the Rebound

The Fisher Returns, by Gayle Goddard-Taylor (page 22)

Invite a biologist from your state's fish and wildlife agency to speak with your students about wildlife reintroduction in your state. What animals have been reintroduced during the last century and what is their current status? What are the scientific and political processes that lead up to reintroduction? What issues surround reintroduction? Students may be surprised to learn that animals that we now take for granted as part of our northeastern landscape—like white-tailed deer, turkey, and beaver—were once so rare that they were reintroduced in many locations.

Have students select a reintroduced species to research in depth, exploring the animal's ecology, population history, current status, success of reintroduction efforts, and so on. Students can then prepare an engaging display to inform viewers about the ecology of the animal they have chosen.

What are some of the political issues that cause agencies not to proceed with reintroduction—like in the case of lynx and wolf? Also, sometimes the reintroduced species doesn't have any real natural predators and recovers TOO successfully. See the *Rutland Herald* article on the fishers eating the house cats in Rutland.http://rutlandherald.com/ Archive /Articles/Article/72784.

Environmental Interpretation, by Sam H. Ham. North American Press: Golden, CO. 1992. Teaches how to develop an effective, educational display.

The PBS website, *American Field Guide*, offers a lesson plan for high school students on native species restoration. http://www.pbs.org/americanfield-guide/teachers/native_species/native_species_sum.html.

Steve Parren of the Vermont Fish and Wildlife Department wrote, *Wildlife in Vermont's Changing Landscape: a 13,000 Year Perspective*, Part IV of which gives an overview of threatened and endangered species in Vermont and reintroduction efforts. It's available online at http://www.lsc.vsc.edu/ personal/faculty/yalea/VTR/ EarlyWildlife.htm.

The Annotated Bibliography of Wildlife Translocations, available online through the University of Alaska Fairbanks, is an excellent resource for tracking down scientific research regarding reintroductions. The index allows you to search reintroductions by state. http://mercury.bio.uaf.edu/~brad_griffith/translocation.ssi.

Wildlife Issues: Community Attitude Survey
Planting Animals

ME English Language Arts A, D, H
Science and Technology J, L
Visual and Performing Arts A

NH English Language Arts 1, 2, 5, 6
Science 1a, 6c

VT 1.8 Reports
1.9 Research
2.14 Planning/Organization
3.9 Sustainability
4.6 Understanding Place
6.2 Uses of Evidence and Data
6.3 Analyzing Knowledge
7.13 Organisms, Evolution, and Interdependence

4. The World of Winter Tracking (field study)

Palm Pilots and Paw Prints (page 14)
At Home in the Snow, by Roger Irwin (page 38)

Winter snow offers a blank page upon which wildlife write the story of their daily lives.

Don't miss the chance to read these pages with your students. Irwin's photographs will show students a few of the animals that remain active in the northern winter. The palm pilot article shows students some uses for computer technology in studying wildlife ecology. While you may opt for delving into Cybertracker technology, you don't need it to conduct interesting and informative tracking investigations.

Use flagging to establish study sites on your school grounds in various habitats (open field, edge between field and forest, forest, riparian area). Tracking is usually best after a thin covering of fresh snow has fallen. Note the variety and abundance of tracks in each habitat, and try to visit the sites several times during the winter season. Have students measure (see SUNY/Oswego curriculum), draw, and interpret the layout of the tracks they find (use the excellent tracking guide by Levine and Mitchell listed below). What animals frequent your schoolgrounds? In what habitat did you find them? What are they doing there (what needs are they meeting)? Students can share their findings through a variety of media—scientific report, fictional story, poem, artistic rendering.

Mammal Tracks: Life-Size Tracking Guide, by Lynn Levine and Martha Mitchell. Heartwood Press, 2001.

Check out SUNY/Oswego's site, *The Winter Science Curriculum Project (described in Noteworthy News)* http://www.oswego.edu/ wscp. It offers a good lesson plan for teaching high school students about winter tracking and its role in studying animal behavior and ecology.

If you are interested in obtaining Cybertracker software, it's available free online through http://www.deer-

CAREER CONNECTION

At Work Minding 273 Miles of River with David Deen, by Madeline Bodin (page 62)
Gifford Pinchot: A Politician's Nature, by Char Miller (page 40)

Bodin's article reveals how David Deen unites his passion and his employment. His fishing passion prompted his work as a fishing guide and his subsequent role as river steward. His desire to act upon his strong beliefs led to his work as a state legislator. Gifford Pinchot likewise translated passion and expertise into many years of public service.

Have your students list the things they are very interested in and brainstorm the professions that could stem from those passions. Have each student identify someone in the community who does work in their area of interest. Students can then interview them and learn about what drew them to their profession, what they like and dislike about their work, how they spend their workdays, and so on. Have students write about their reactions to what they learn in the interview. Can they imagine doing similar work? What would they do differently?

IPLT Who Works in this Forest?

Wildwork

ME Career Preparation A
English Language Arts

NH English Language Arts 2

VT 1.12 Personal Essays
3.15 Career Choices

Suggested Activities

dance.org. (click on "Cybertracker Support").

Tracks!

ME Science and Technology J
Visual and Performing Arts A
English Language Arts E

NH Science 1a, 2a
English Language Arts 2

VT 1.12 Personal Essays
4.6 Understanding Place
5.29 Visual Arts
7.1 Scientific Method
7.2 Investigation
7.13 Organisms, Evolution, and Interdependence

5. Algae Research and Genetic Modification (current events)

Photosynthetic Algae Tint Snowfields, by Kate McKenney (page 45)

In this article, McKenney summarizes the latest research on a winter-hearty algae, *Chlamydomonas nivalis*, and postulates, "genes from the algae could possibly be spliced into crop plants, extending their growing seasons." The United States grows over two-thirds of all genetically modified crops planted globally (96 million acres of GM crops in 2002). Controversy surrounding genetic engineering of crop plants fills the media these days, and this article provides a lead-in to discussing the issues surrounding genetic modification.

The resources listed below will help provide background to the genetic modification debate. Have your students research, identify, and debate the issues involved – both the general subject of genetic modification and the specific case suggested in this article. What are the potential benefits of such modification? What are the risks? The ethical considerations? What legislation currently regulates genetic modification? What regulations, if any, should exist?

The John Innes Centre, Europe's premier independent research center for the study of plant and microbial science, hosts a website designed to provide balanced scientific and factual information on genetically modified crops and related topics. http://www.gmissues.org/index.htm. This site offers a section with links and information for teachers.

http://www.pbs.org/wgbh/nova/genome/. This online companion to the PBS Nova program, "Cracking the Code of Life," suggests resources and curricula on genetics and genetic engineering. The Nova program is available online, but the accompanying resources are useful whether or not you view the video.

Teaching Controversial Issues (Appendix)Z
There Ought to be a Law

Enviro-Ethics
Philosophical Differences

ME English Language Arts A, D, H

NH English Language Arts 2, 3, 6

VT 1.19 Research
6.2 Uses of Evidence and Data
6.3 Analyzing Knowledge
6.14 Forces of Unity and Disunity
6.18 Nature of Conflict
7.13 Organisms, Evolution, and Interdependence

6. Legacy Trees (field study)

Book review: *Remarkable Trees of the World*, by Thomas Pakenham (page 67)

Ecologists refer to mature, reproductive-age living trees as "biological legacies" because they (along with other biological legacies like organic matter, logs, seeds, and so on) store within them the landscape's ability to recover from disturbance and adapt to change. Because trees often live far longer than human beings, they connect us to our cultural past, spanning generations of human history. As such, they are also "cultural legacies," valuable as part of your community's history and collective memory.

Have students catalog the Legacy Trees in your community—rees that are remarkable for their physical structure, age, history, beauty, habitat for wildlife, or for the human stories associated with them. Have each student record a tribute to at least one tree, photographing and drawing it in various seasons, interviewing people who have stories to tell about the tree, recording its vital statistics (height, diameter), and so on. They can compile the records into an album to display in your community, at the public library or town office.

The Trees in my Forest, by Bernd Heinrich. Perennial: 1998. Heinrich provides an exemplary tribute to the important trees in his life.

American Forests launched the National Register of Big Trees in 1940–a listing of the largest known trees in the United States. The register lists the biggest trees for 826 native and naturalized species in the continental United States and Alaska. The register relies on nominations from the public, and there are currently 99 species and six states without any big tree champs. Nomination forms and instructions can be downloaded from American Forests' website, http://www.americanforests.org.

Adopt a Tree

ME Visual and Performing Arts A
English Language Arts D

NH Social Studies 17

VT 2.1 Types of Questions
4.6 Understanding Place
5.29 Visual Arts
6.4 Historical Connections
6.6 Being a Historian

WILDLIFE CONNECTION

Marbled Salamanders Call Vernal Pools Home, by Kate McKenney (page 44)

The marbled salamander is a member of the family Ambystomatidae, a group commonly known as mole salamanders, because of the family's shared trait of living most of their lives underground. This article provides a lead-in to explore the fascinating realm of taxonomy, the scientific classification system into which all living things are grouped according to evolutionary similarities.

Starting with mole salamanders, feature a different taxonomic family each month as subject for a classroom display. What traits unite members of this family? Which genuses and species are part of this family? Which members may inhabit your community? What are their habitat needs? Where in your community does that habitat exist?

ME English Language Arts A, D, H
Visual and Performing Arts A

NH English Language Arts 1, 5

VT 1.19 Research
6.2 Uses of Evidence and Data
5.29 Visual Arts
7.13 Organisms, Evolution, and Interdependence

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Word Search

"Winter Buds," excerpted from *The Winter World* by Bernd Heinrich (page 54)

Like apple and cherry trees, this tree species has buds that encase both flowers and leaves together.

Bird species that eats birch buds (2 words).

Mammal that eats the terminal (end) buds of balsam fir trees (2 words).

Purple finches eat the buds of this tree (2 words).

Striped maple buds and twigs are a favorite food of this mammal.

One of the first tree species to leaf out in the Northeast (2 words).

Like poplars, the buds of this tree species bear a sticky, resinous coating that protects them from browsing animals (2 words).

Tree species that blooms in October (2 words).

Like poplars and alders, this kind of tree has separate buds for leaves and flowers.

Witch hazel flowers are pollinated by this kind of insect genus.

V G R M T R W I L M O S R E I L G S N
H U E F O U L E Z A H H C T I W U E T
T S D W Q O Q E U R T S O O M I P U Q
W X A E I C Z U O P E R Q U H S D R G
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P J I B P A J O U I O A N R W I O S C
K Y S H U Q T G W T D I T S P U E Q T
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Y P W M M C S I U R P O L L I W H E S
E N D R E B H K E A U Q O G U S G L Q

Northern Woodlands

Word Search

"Winter Buds," excerpted from *The Winter World* by Bernd Heinrich (page 54)

Like apple and cherry trees, this tree species has buds that encase both flowers and leaves together. **Shadbush**

Bird species that eats birch buds (2 words). **Ruffed Grouse**

Mammal that eats the terminal (end) buds of balsam fir trees (2 words). **Red Squirrel**

Purple finches eat the buds of this tree (2 words). **Sugar Maple**

Striped maple buds and twigs are a favorite food of this mammal. **Moose**

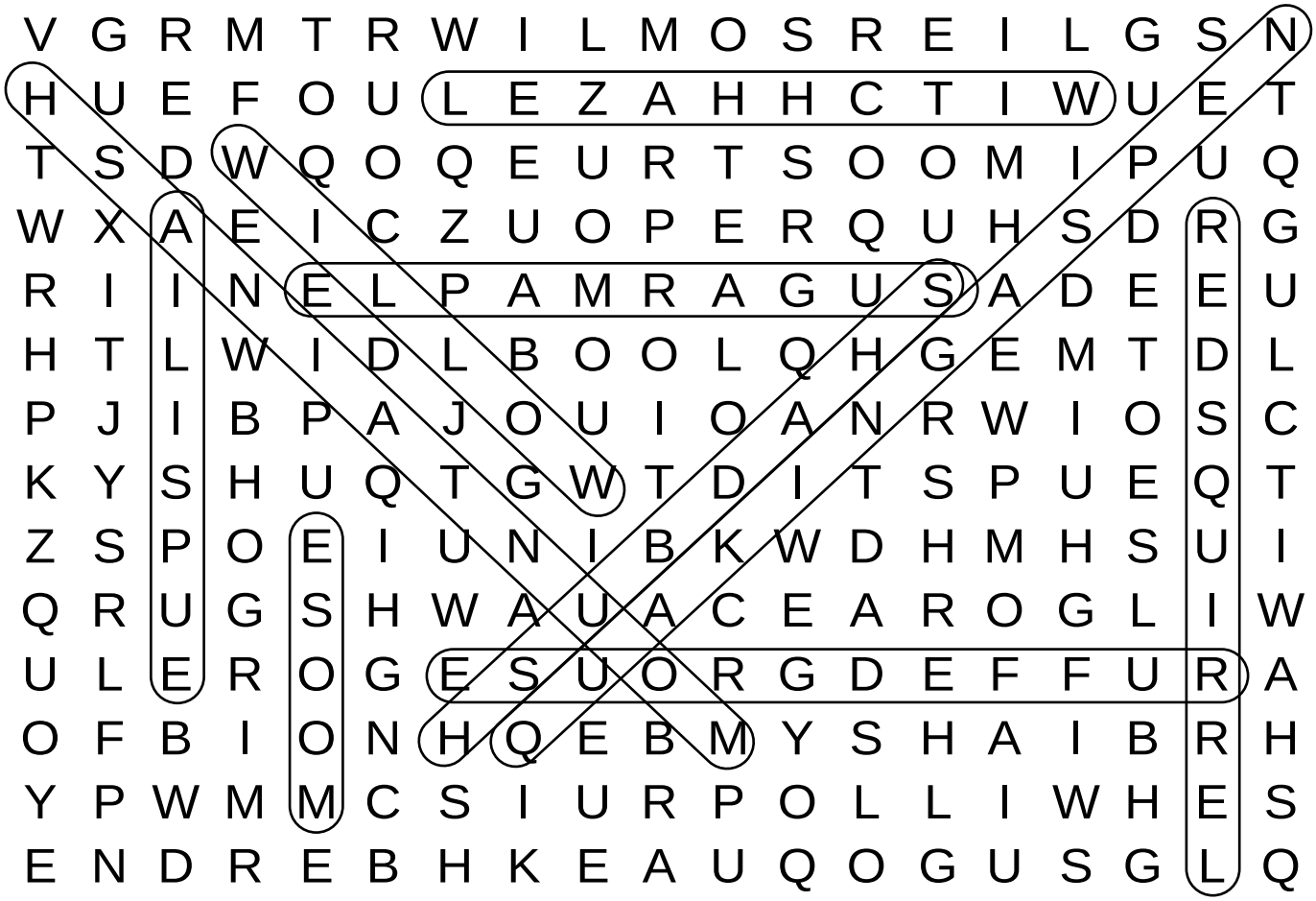
One of the first tree species to leaf out in the Northeast (2 words). **Quaking Aspen**

Like poplars, the buds of this tree species bear a sticky, resinous coating that protects them from browsing animals (2 words). **Mountain Ash**

Tree species that blooms in October (2 words). **Witch Hazel**

Like poplars and alders, this kind of tree has separate buds for leaves and flowers. **Willow**

Witch hazel flowers are pollinated by this kind of insect genus. **Eupsilia**



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Writing Exercise

A Place in Mind, by Beth Harpaz (page 76)

In her essay, Beth Harpaz describes her intimate connection to her family's home in Maine. Where is the landscape or particular place you are most drawn to? Where does your connection to that place come from? Describe some of your strongest memories of that landscape, using vivid sensory details to bring it to life.

Extension: Interview your parents or grandparents about the place that matters most to them, the landscape they consider "home." Ask them to show or recount stories, writings, pictures, or other memorabilia that remind them of that place.

Crossword Puzzle

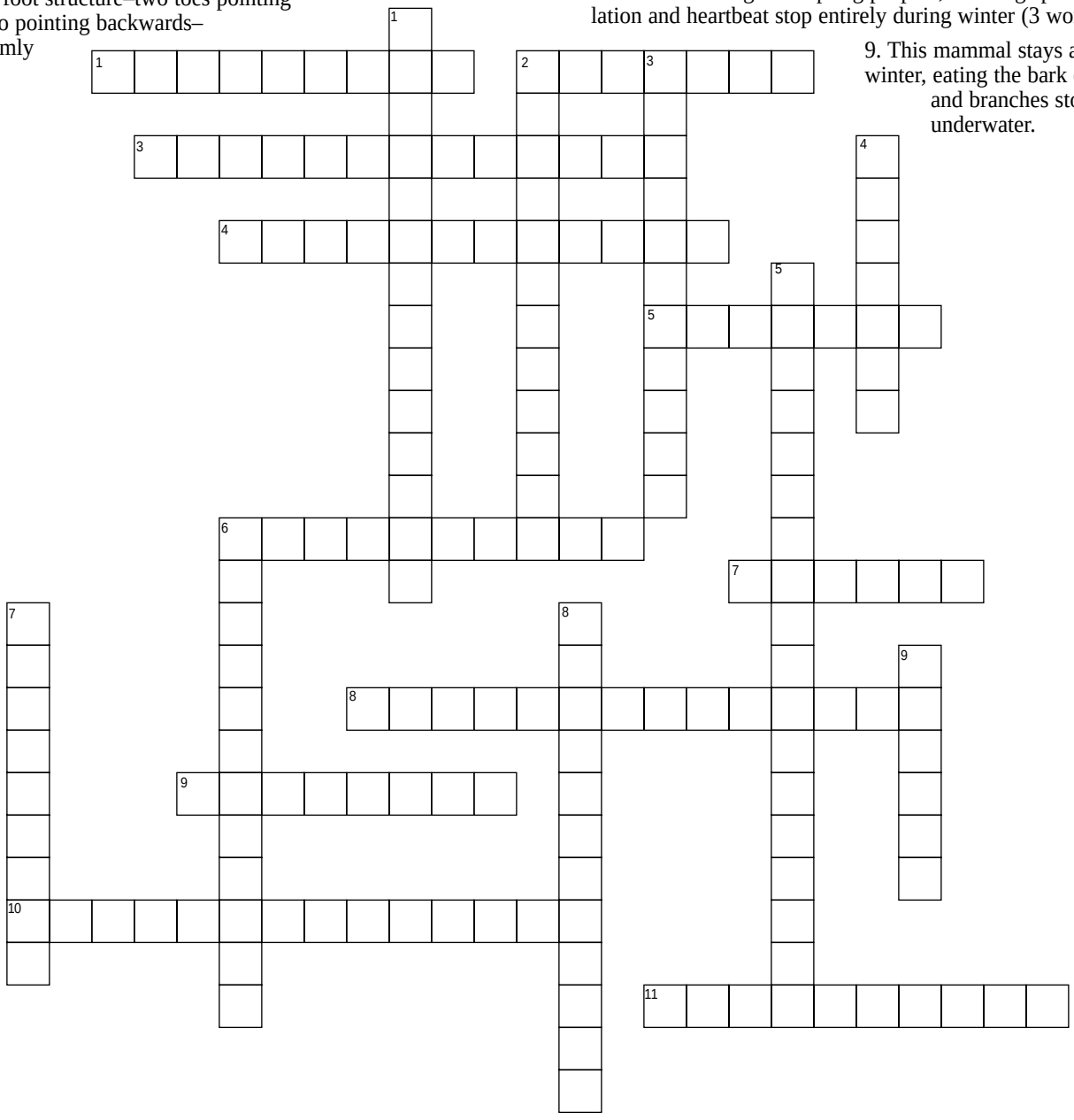
Winter Calendar (page 4)

Across

1. This amphibian overwinters in streams and seeps (2 words).
2. Many winter birds eat the seeds of this common plant.
3. Fern that remains green during the winter.
4. This amphibian hibernates under several inches of soil.
5. This bird species stores away acorns and beechnuts for the winter (2 words).
6. Evergreen plant whose genus name, *Chimaphila*, means "to love winter."
7. This mammal often dens in an old woodchuck burrow (2 words).
8. The seeds of this wildflower can be brewed as tea (3 words).
9. Common winter food for crows.
10. This small predatory bird eats sparrows and chickadees (2 words).
11. Bird whose foot structure–two toes pointing forward and two pointing backwards– helps it hold firmly to tree trunks.

Down

1. Mice eat the seeds of this plant, also known as rattail (2 words).
2. This bird often burrows into the snow on winter nights to keep warm (2 words).
3. This wetland species of holly sports red berries in winter.
4. Large predatory bird that eats ruffed grouse.
5. Along with belted kingfishers, red-tailed hawks, and turkey vultures, birds of this species are among the first migrants to return to the Northeast in spring (3 words).
6. You may spot this bird species in the road in winter, eating salt (2 words).
7. This mammal eats the ends of hemlock twigs.
8. Like wood frogs and spring peepers, this frog species' circulation and heartbeat stop entirely during winter (3 words).
9. This mammal stays active all winter, eating the bark of twigs and branches stored underwater.



Northern Woodlands

Crossword Puzzle

Winter Calendar (page 4)

Across

1. This amphibian overwinters in streams and seeps (2 words). **Green Frog**

2. Many winter birds eat the seeds of this common plant. **Ragweed**

3. Fern that remains green during the winter. **Christmas Fern**

4. This amphibian hibernates under several inches of soil. **Spring Peeper**

5. This bird species stores away acorns and beechnuts for the winter (2 words). **Blue Jay**

6. Evergreen plant whose genus name, *Chimaphila*, means "to love winter." **Pipsissewa**

7. This mammal often dens in an old woodchuck burrow (2 words). **Red Fox**

8. The seeds of this wildflower can be brewed as tea (3 words). **Queen Anne's Lace**

9. Common winter food for crows. **Roadkill**

10. This small predatory bird eats sparrows and chickadees (2 words). **Northern Shrike**

11. Bird whose foot structure–two toes pointing forward and two toes pointing backwards–helps it hold firmly to tree trunks. **Woodpecker**

Down

1. Mice eat the seeds of this plant, also known as rattail (2 words). **Common Plantain**

2. This bird often burrows into the snow on winter nights to keep warm (2 words). **Ruffed Grouse**

3. This wetland species of holly sports red berries in winter. **Winterberry**

4. Large predatory bird that eats ruffed grouse. **Goshawk**

5. Along with belted kingfishers, red-tailed hawks, and turkey vultures, birds of this species are among the first migrants to return to the Northeast in spring (3 words). **Red-Winged Blackbird**

6. You may spot this bird species in the road in winter, eating salt (2 words). **Pine Grosbeak**

7. This mammal eats the ends of hemlock twigs. **Porcupine**

8. Like wood frogs and spring peepers, this frog species' circulation and heartbeat stop entirely during winter (3 words). **Gray Tree Frog**

9. This mammal stays active all winter, eating the bark of twigs and branches stored underwater. **Beaver**