



Spring 2008 Northern Woodlands Goes To School

Welcome to the Spring 2008 edition of *Northern Woodlands* magazine. After a long winter, the woods are coming alive with spring energy. In this *Northern Woodlands* issue, you'll find articles that will inspire you and your students to explore this greening world outside the classroom door. Read about Robert Kimber's rites of spring, then head for the woods to create your own springtime rituals. Contemplate your connection to nature through Malin Clyde's *An Outdoor Life*. Articles in this issue of *Northern Woodlands* will help students discover the fungi, trees, flowers, and wildlife of the Northern Forest.

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 are able to participate in Northern Woodlands Goes to School this year. The sponsors are: Fountain Forestry, Inc., Frank and Brinna Sands Foundation, French Foundation, International Paper, Maine TREE Foundation, Merchants Bank, New England Forestry Foundation, Northeastern Lumber Manufacturers Assoc., Twinflower Farm, and Wells River Savings Bank.

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, just call or email Anne Margolis at (802) 439-6292 (email: anne@northernwoodlands.org).

Noteworthy News

Be sure to check out the **new *Northern Woodlands* website!** It's the same address as before, www.northernwoodlands.org, but with many new resources. In our Northern Woodlands Goes to School webpages, you can download teacher's guides for the last several years of the magazine. You can also download lesson plans created by other teachers, and post curriculum suggestions of your own. If you have a forest-related teaching unit or project that you'd like to add to the online library, email it to Anne Margolis, NWGTS coordinator at anne@northernwoodlands.org. (Microsoft Word, plain text, or PDF formats are all fine.)

1. Learning from the Land

An Outdoor Life by Malin Ely Clyde (pg. 32)

In this article, Malin Clyde notes that many children in our culture today “are in scheduled activities, or playing indoors, or connected to technology and computers,” rather than working and playing outdoors. She describes the benefits of an outdoor-based upbringing that cultivates a strong connection between children and nature. Have your students read the article and discuss as a group the points Clyde makes. Do students agree that it’s important to regularly spend time in nature? What is lost (personally, culturally) when many young people lose that connection?

Then have your students develop and conduct a survey to assess their own and their classmates’ connection with the natural world. Their questions could range from demographic information to actual assessment of knowledge of the natural world. How many acres of land does your family own? How many hours a day do you spend outside (excluding time spent in a team sport)? What activities do you take part in outdoors? Does your family cut its own firewood? Do you have outdoor chores? What are five common tree species near your home? And so on. Once students create the survey, have them take survey themselves and in another class (their own data will be biased by the fact that they created the survey, but will be very informative, nonetheless, for them to complete), analyze the survey results, and write a report of their findings.

PLT	Personal Spaces (Secondary Environmental Education Program, <i>Places We Live</i> learning module)
ME	English Language Arts A, D, E, H Science and Technology J
NH	English Language Arts 1, 2, 5, 6
NY	MST 2 Information Systems MST 7 Strategies CDOS Managing Information
VT	1.19 Research 1.5 Writing Dimensions 1.8 Reports 2.14 Planning/Organization 6.3 Analyzing Knowledge

Websites: Perdue University hosts a useful website with good background information on conducting surveys. www.owl.english.purdue.edu/owl/resource/559/06/. You’ll find many other such sites online, by searching “survey design.”

Books: *Last Child in the Woods: Saving our Children from Nature-Deficit Disorder*, by Richard Louv. Algonquin Books: 2005.

2. Northeastern Lumber Heritage

The Thunderstorm Mill: Making Lumber the Old-Fashioned Way, by Elinor Osborn (pg. 46)

Osborn’s article sheds light on an early chapter in the story of northeastern lumbering—the era of the water-powered sawmill. Help your students discover the logging history of your area. Students can divide into research teams to investigate aspects of regional lumber heritage, including technological innovations to the lumber industry (in tree felling, transportation, and milling), ecological changes brought about by logging, present-day logging industry, and any other topics your students identify as important. Were there water-powered sawmills along rivers in your region? How did forest cover change over time? Are there historic photographs in community archives that show old-time logging and milling? Are there community elders who were involved in early logging and milling? If yes, have students interview them, or invite them into the classroom to tell their stories. If your community has remnants of historic logging operations (water-powered mills, old logging railroad grades, and so on), have students visit and photograph them.

PLT	Then and Now Mapping Your Community Through Time (Secondary Environmental Education Program, <i>Places We Live</i> learning module)
ME	English Language Arts B History B Visual and Performing Arts A
NH	Social Studies 17 Visual Arts 1.6 Science 4c
NY	SS 1 SS 3 ART 1 Visual Arts
VT	4.6 Understanding Place 5.29 Visual Arts 6.4 Historical Connections 6.6 Being a historian 6.8 Movements and Settlements 7.16 Natural Resources and Agriculture

Encourage students to develop an engaging display that brings your area's logging history to life, using photographs, dioramas, actual artifacts, time lines, and so on. Place it on display at your local library or other community meeting place.

Books: *Timberrr!: A History of Logging in New England*, by Mary Morton Cowan. Millbrook Press: 2003. This excellent book is appropriate for middle school students.

Logging and Lumbering in Maine, by Donald A. Wilson. Arcadia Publishing: 2001.

Tall Trees, Tough Men: A Vivid, Anecdotal History of Logging and Log-Driving in New England, Robert E. Pike. Norton & Company: 1999.

3. In Praise of Trees

Jack Pine, Pinus banksiana, by Virginia Barlow (pg. 53)
This short article reveals the secret and fascinating life of jack pines, one of the lesser-known members of the Northern Forest woodland community. Take your students on a walk through your school grounds or community forest to become acquainted with local trees. Invite your county forester to join you and help with identification. A springtime walk will allow students to see trees in various stages of leaf-out: buds, flowers, and unfurling leaves. Have your students choose one of the species you identify and research its natural and cultural history, its niche in the forest community, its ecological wonders. How is it adapted to the habitat in which it lives? Ask students to create a short, dynamic presentation on their species. Then take them on the same woods walk and allow them to deliver their presentations by the trees they studied.

Websites: Arbor Day Foundation website offers an online key to tree identification: www.arborday.org/trees/WhatTree.cfm?ItemID=E6A.

Books: *A Field Guide to Eastern Trees*, by George A. Petrides. Houghton Mifflin: 1998.

PLT	Words to Live By (Secondary Environmental Education Program, <i>Focus on Forests</i> learning module) Adopt-a-Forest (Secondary Environmental Education Program, <i>Forest Ecology</i> learning module) The Closer You Look Bursting Buds
ME	Science and Technology B, L, J Physical Education A English Language Arts A, D, E, G, H
NH	Science 1a, 2a, 3a Physical Education 1 English Language Arts 1, 2, 3, 5, 6
NY	MST 1 Scientific Inquiry MST 4 The Living Environment MST 7 Strategies HPHE 1 Physical Education CDOS 3 Managing Information
VT	1.15 Speaking 1.19 Research 1.21 Selection 3.5 Physically Active Lifestyle Choices 6.2 Uses of Evidence and Data 7.2 Investigation 7.13 Organisms, Evolution, and Interdependence

4. The Fungus Among Us

Birch polypore, Piptoporus betulinus, by Virginia Barlow (pg. 61)
This article provides a wonderful introduction to the world of fungi. Scientists have identified more than 70,000 species in the Fungus Kingdom, and they are essential parts of the web of life. Take your students on a springtime fungus walk. Consult with your local Audubon chapter or county forester for suggestions of a knowledgeable naturalist or mushroom hunter to accompany you. Collect specimens of non-poisonous fungi, like the birch polypore, and bring them back to the classroom to study. You'll find curriculum materials for fungus investigations on The Ecology Center website, listed below. Have each student select a local fungus species and create poster highlighting its life cycle, uses, and ecological niche.

PLT	The Fallen Log Adopt-a-Forest (Secondary Environmental Education Program, <i>Forest Ecology</i> learning module)
ME	Physical Education A Science and Technology B, J Visual and Performing Arts A
NH	Physical Education 1 Science 1a, 2a, 3a Visual Arts 1, 6
NY	HPHE 1 Physical Education MST 1 Scientific Inquiry MST 4 The Living Environment ART 1 Visual Arts
VT	3.5 Physically Active Lifestyle Choices 5.29 Visual Arts 7.2 Investigation 7.13 Organisms, Evolution, and Interdependence

Websites:

Curriculum materials for teaching about fungi can be found on The Ecology Center webpage: www.ecologycenter.org/tfs/lesson.php?id=13511.

5. Biodiversity and Endangered Species

An Icy Life on the St. John River, by Louie Pelletier (pg. 17)
Furbish's lousewort is an endangered species, endemic to the St. John River basin. This article provides a springboard into a study of biodiversity and of the Endangered Species Act as a tool for maintaining biodiversity. After students read the article, field their thoughts and opinions about the importance of protecting plants like Furbish's lousewort. Use the extensive, excellent curriculum materials on the Endangered Species Act provided by the U.S. Fish and Wildlife Service on their website, listed below, to teach students about the Act.

What species of plants and animals are federally listed as threatened, endangered, and sensitive (TES) in your state? Have each student select a species to research in depth. Students can research the plant's or animal's ecology and describe any efforts underway to increase or stabilize populations. Consider inviting a representative from your state wildlife agency to discuss TES species in your state, and help students brainstorm a project they could undertake to enhance biodiversity locally, including streambank restoration, native plantings on the school grounds, and so on.

Websites:

Endangered species curriculum materials can be found on the U.S. Fish and Wildlife Service website:
www.fws.gov/endangered/Kids/kids_edu_mat.html.

PLT	Life on the Edge Cast of Thousands (Secondary Environmental Education Program, <i>Forest Ecology</i> learning module)
WILD	Here Today, Gone Tomorrow Back from the Brink Bottleneck Genes Improving Wildlife Habitat in the Community
ME	English Language Arts A, D, H Science and Technology B, J Civics and Government A
NH	English Language Arts 1, 5, 7 Social Studies 4 Science 3a
NY	CDOS 3 Managing Information CDOS 4 Human & Public Services MST 1 Scientific Inquiry MST 4 The Living Environment MST 7 Strategies
VT	1.19 Research 2.2 Problem Solving 6.3 Analyzing Knowledge 6.9 Meaning of Citizenship 7.13 Organisms, Evolution, and Interdependence

6. The Debate over Wood Boilers

Clearing the Air: Outdoor Wood Boiler Face Regulation, by Hamilton E. Davis (pg. 36)
Davis's article provides an excellent overview of the controversy surrounding outdoor wood boilers. Find out about current restrictions on wood boilers in your state and local community. As a class, have students identify the stakeholders in this issue, including homeowners, neighbors to wood boiler owners, sales representatives for the boilers, town council members, air quality specialists (from your state department of environmental conservation), and so on. Have each student choose a stakeholder to represent and research the issue in depth from their perspective. Remind them that the more deeply they research, the better they will be able to articulate their position. Hold a mock town council meeting to discuss and debate the regulation of outdoor wood boilers in your community.

Website:

Northeast States for Coordinated Air Use Management (NESCAUM) has a great deal of information on wood boilers (which they refer to as outdoor hydronic heaters) at www.nescaum.org/topics/outdoor-hydronic-heaters.

Woodheat.org hosts an information-filled website that covers many aspects of wood heating, including outdoor wood boilers, www.woodheat.org.

PLT	Regional Community Issues: The Ogallala Aquifer (Secondary Environmental Education Program, <i>Places We Live</i> module) Far Reaching Decisions (Secondary Environmental Education Program, <i>Places We Live</i> module) We Can Work it Out Democracy in Action There Ought to Be a Law
WILD	Philosophical Differences Enviro-Ethics
ME	English Language Arts A, D, E, H Science and Technology B Economics A
NH	English Language Arts 1, 3, 5 Science 3a Social Studies 5, 9
NY	ELA 3 Listening and Speaking MST 4 The Living Environment MST 7 Strategies CDOS 3 Managing Information SS 4
VT	1.19 Research 1.21 Selection 6.2 Uses of Evidence and Data 6.3 Analyzing Knowledge 6.14 Forces of Unity and Disunity 6.18 Nature of Conflict 6.19 Identity and Interdependence 7.13 Organisms, Evolution, and Interdependence

Wildlife Connection

Tale of the Tick: How Lyme Disease Is Spreading Northward, by Dave Mance (pg. 26)

Mance's article reveals the remarkable complexity of the web of life, as evidenced through Lyme

disease. Mance describes the intriguing Lyme disease story, with a cast of characters that includes spirochetes, rodents, deer, migratory birds, passenger pigeons, wolves, invasive exotics, and people. Here you have the makings of a great drama! Using the add-a-line method of story writing, have the class collectively write a dramatic story that tells the Lyme disease life cycle. One student will offer an opening line ("One balmy spring afternoon, little Jimmy Smith headed into the forest with his dog Rex..."), which you can record on paper or computer, and then the next student will add an appropriate line to follow it, and so on. This method of story-telling is a fun way for students to process and integrate the article's extensive scientific information. Reread the story to the students and have them check to make sure they've included all the important facets of the Lyme disease story. It may be helpful, before you begin the add-a-line story, to diagram with the students the interrelationships among the many Lyme disease characters.

PLT	Web of Life Far-Reaching Decisions (Secondary Environmental Education Program, <i>Places We Live</i> learning module)
ME	English Language Arts E, G, H Science and Technology B
NH	English Language Arts 3, 6, 7 Science 3a
NY	MST 4 The Living Environment MST 7 Strategies
VT	1.15 Speaking 1.16 Artistic Dimensions 3.10 Teamwork 4.6 Understanding Place 7.13 Organisms, Evolution, and Interdependence

Websites:

The University of Connecticut offers extensive curriculum materials for teaching about Lyme disease at:

www.ucc.uconn.edu/www.ucc.uconn.edu/~wwwlyme/tcura.html.

Students will find plenty of good information on Lyme disease at the Center for Disease Control's website: www.cdc.gov/ncidod/dvbid/lyme/

Career Connection

Book review of *Deforesting the Earth: From Prehistory to Global Crisis* by Michael Williams (pg. 68)

Carl Reidel concludes his review of Michael Williams's book by noting that the book "is a warning that forest policy must be enlarged to encompass humanitarian concerns and environmental ethics if our profession is to be relevant in a rapidly-changing world." This notion is a wonderful lead-in to a discussion of the role of social responsibility in professional life. Many professions have formed alliances to promote social responsibility in their field, including Physicians for Social Responsibility, Educators for Social Responsibility, Business for Social Responsibility, Computer Professionals for Social Responsibility, and many more.

Have students contemplate together, then research a specific facet on their own, the humanitarian concerns and issues of environmental ethics connected with forestry today. They could limit their study to your region, or you could have students select different regions of the world to study. Have them interview foresters to hear their thoughts on social issues in forestry. There are excellent examples of local attempts to address humanitarian concerns in forestry, including Vermont Family Forests's Little Hogback Community Forest project, which was the subject of a feature story in the Winter 2007 issue of *Northern Woodlands* (pg. 36 of that issue).

PLT	Words to Live By (Secondary Environmental Education Program, <i>Focus on Forests</i> module) Take Action! (Secondary Environmental Education Program, <i>Focus on Forests</i> module) Far-Reaching Decisions (Secondary Environmental Education Program, <i>Places We Live</i> module)
ME	Career Preparation A Science and Technology B, M English Language Arts A, D, E, H
NH	Career Learning 7 Science 3a, 3b, 4c, 6a Social Studies 13, 14 English Language Arts 1, 5
NY	CDOS 1 CDOS 3 Managing Information MST 4 The Living Environment MST 7 Strategies SS 3
VT	1.8 Reports 1.19 Research 3.9 Sustainability 3.15 Career Choices 6.3 Analyzing Knowledge 7.13 Organisms, Evolution, and Interdependence 7.16 Natural Resources and Agriculture

Calendar Connection*Spring Calendar* (pg. 4)

Make a large classroom wall calendar, with squares for each day as large as possible—six inches would be perfect. Each day, have a different student note the air temperature at a particular time of day, the weather conditions, and one sign of spring that they observe. Their challenge is to record a unique observation for each day. Encourage them to draw a sketch to accompany their written observations on the classroom calendar. Each week, read together the appropriate calendar observations from the *Northern Woodlands Spring Calendar* to help students visualize the kinds of changes that are going on in the outdoor world around them.

PLT	Bursting Buds
ME	Visual and Performing Arts A Science and Technology B, J
NH	Visual Arts 1, 6 Science 1a, 2a, 3a
NY	ART 1 Visual Arts MST 1 Scientific Inquiry MST 4 The Living Environment
VT	5.29 Visual Arts 7.2 Investigation 7.13 Organisms, Evolution, and Interdependence

Crossword Puzzle

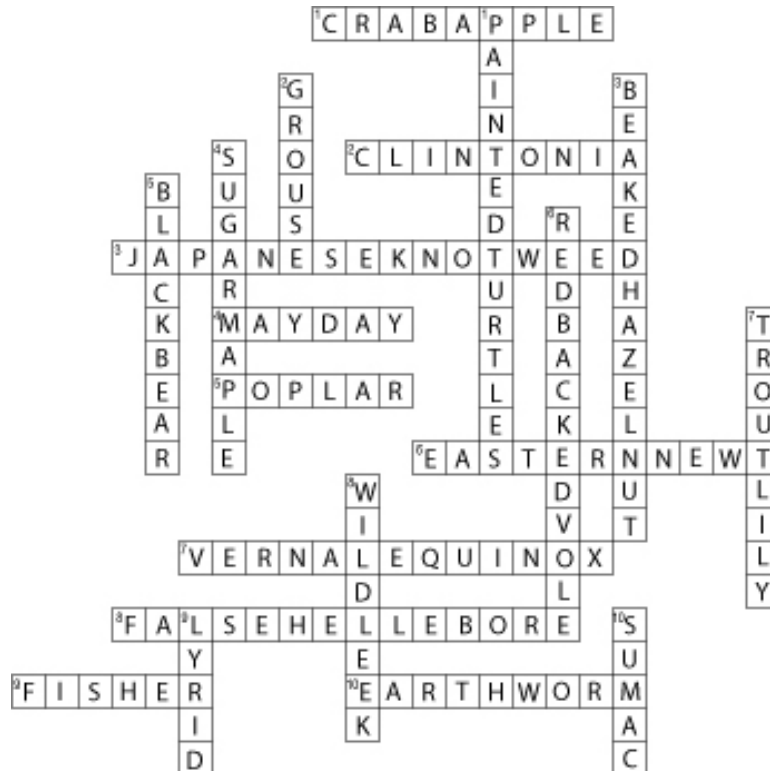
Spring Calendar (pg. 4)

ACROSS

1. Pine grosbeaks and cedar waxwings eat the fruits of this tree in late winter. CRABAPPLE
2. This woodland wildflower is also known as Bluebead Lily. CLINTONIA
3. The young shoots of this invasive exotic plant are edible (two words). JAPANESE KNOTWEED
4. The midpoint between the spring equinox and the summer solstice (two words). MAY DAY
5. The buds of this tree will open in early March during a warm spell. POPLAR
6. This amphibian lays as many as 250 eggs on underwater vegetation (two words). EASTERN NEWT
7. Day and night are of equal length all over the world on this day (two words). VERNAL EQUINOX
8. This wetland plant is often the first bright green growth in swamps and wet meadows in spring (two words). FALSE HELLEBORE
9. The young of this woodland mammal, called pups, are born in March. FISHER
10. Male woodcocks need to wait for the ground to thaw before returning north in spring, because they eat this underground animal. EARTHWORM

DOWN

1. One of the first turtles to emerge from hibernation in spring (two words). PAINTED TURTLE
2. This bird eats dandelions, clover, and the new leaves of many tree species. GROUSE
3. This shrub bears tiny, bright purple flowers (two words). BEAKED HAZELNUT
4. This tree species flowers later in spring than silver and red maples (two words). SUGAR MAPLE
5. This mammal can lose 40 percent of its body weight during hibernation (two words). BLACK BEAR
6. The first litter of this small mammal is born beneath the snow in late winter (three words). RED-BACKED VOLE
7. This yellow flower opens and follows the sun during the day and closes at night (two words). TROUT LILY
8. This edible forest plant begins to green the forest floor in the first weeks of spring (two words). WILD LEEK
9. April meteor shower. LYRID
10. In late winter, when the supply of favorite foods is running low, evening grosbeaks and robins will eat the berries of this plant. SUMAC



Crossword Puzzle

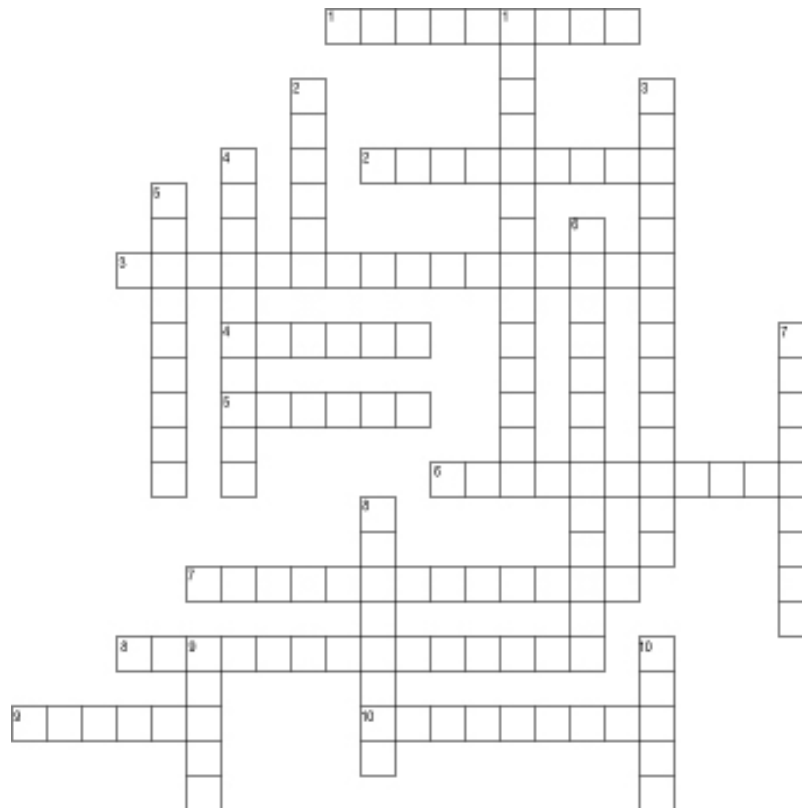
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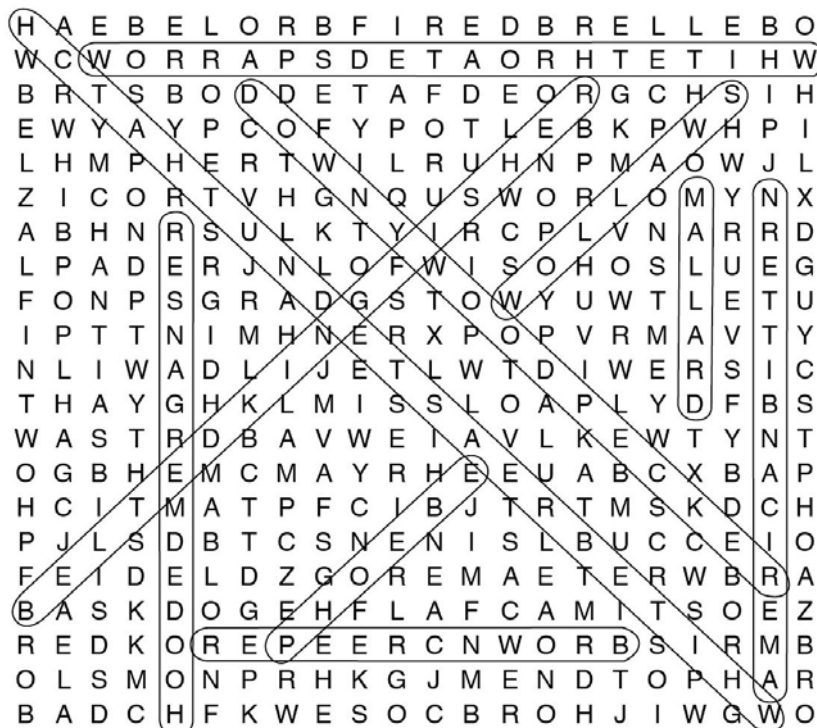
Word Search

Birds of the Northern Forest

Spring Calendar (pg. 4)

Using the *Northern Woodlands Spring Calendar* to help you solve the clues, find ten birds of the Northern Forest in the word search below.

1. It takes this bird species sixteen days to excavate a nest cavity (two words). DOWNY WOODPECKER
2. As soon as ice has melted from the open water where it catches fish, this bird migrates north (two words). BELTED KINGFISHER
3. When the male of this bird species calls, it sounds like the steady hammering of a pile driver (two words). AMERICAN BITTERN
4. If you venture into brushy and open habitats in spring, you may hear this bird singing its song, which sounds like “*Poor Sam Peabody, Peabody, Peabody*” (three words). WHITE-THROATED SPARROW
5. Although most songbirds build a new nest each year, this songbird may reuse last year’s nest. PHOEBE
6. Listen for the *see-see-see-see* call of this songbird in forests throughout northern New England in early spring (two words). BROWN CREEPER
7. A fish-eating duck (two words). HOODED MERGANSER
8. This waterfowl species builds its nest while it lays its eggs. MALLARD
9. According to folklore, the flight patterns of this songbird can predict the weather. SWALLOW
10. When building a birdhouse for this songbird, you need to make the entrance hole 1¼ inches in diameter (three words). WHITE-BREASTED NUTHATCH



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H A E B E L O R B F I R E D B R E L L E B O
W C W O R R A P S D E T A O R H T E T I H W
B R T S B O D D E T A F D E O R G C H S I H
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