

## CITIZEN SCIENCE

“*Citizen science* is a term used for projects in which volunteers, many of whom may have no specific scientific training, perform research-related tasks such as observation or measurement. The use of citizen-science allows scientists to accomplish research objectives more feasibly than would otherwise be possible. In addition, these projects aim to promote public engagement with the research, as well as with science in general” (from [http://en.wikipedia.org/wiki/Citizen\\_science](http://en.wikipedia.org/wiki/Citizen_science)).

Perhaps more than any other scientific field, ornithology has come to benefit tremendously from the contributions of citizen scientists. It is our hope that the resources listed in this appendix will help students and their communities understand that their observations and work can benefit our larger understanding of birds and the ecosystems they inhabit. Giving students the opportunity to do fieldwork allows them to participate in the process of “doing science” and directly connects them with environmental conditions.

### [Vermont Center for Ecostudies](#)

The VCES is a research organization dedicated to the understanding and conservation of birds, insects, mammals, amphibians and other wildlife. VCES offers many opportunities to participate in [citizen science](#); some of which require no previous training. One such program is [Mountain Birdwatch](#), which monitors Bicknell’s Thrush and other montane forest birds.

### [Cornell Lab of Ornithology](#)

The Lab of Ornithology offers several [citizen science](#) projects in which students can participate, including BirdSleuth, Celebrate Urban Birds, and Pigeon Watch.

### [National Audubon Society](#)

The National Audubon Society and Cornell Lab of Ornithology host a yearly end of winter bird count called the [Great Backyard Bird Count](#). The Great Backyard Bird Count is an annual four-day event that engages bird watchers of all ages in counting birds to create a real-time snapshot of where the birds are across the continent. If you reside in the United States or Canada, you can participate no matter your skill level or location.

## SERVICE-LEARNING PROJECTS

Numbers of migratory birds have decreased by nearly 50% in the past 50 years, and this seems to be largely due to the effects human beings are having on the planet. (Actions such as the clearing of forests and the draining of wetlands have greatly reduced seasonal bird habitats as well as the stopover sites used for rest and refueling during migration. In addition, birds encounter hazards as they migrate: they collide with windows, communications towers and wind turbines, and, since many birds depend on constellations for navigation, they can be confused and disoriented by artificial lights in the night sky.) As many as half of all migratory birds that head south for the winter do not make it back to breed in the spring. Engaging students in service learning projects benefits students and birds alike!

### [International Migratory Bird Day Festival](#)

Established by the Council for Environmental Education, this event is held officially on the second Saturday in May each year to “provide an opportunity to celebrate...and support migratory birds and bird conservation.” The CEE publication *Flying WILD: An Educator’s Guide to Celebrating Birds* contains information for teachers wishing to plan a festival event with students.

### **101 Ways to Help Birds** (Erickson, Laura. Stackpole Books, 2006)

This book is filled with information and suggestions for those wishing to be stewards of bird and bird habitat. It includes practical ideas for students that range from helping birds around the home to helping them on a larger scale.

[Project HOME: Homes for Wildlife in the Schoolyard](#) is offered by the [New Hampshire Department of Fish and Game](#). Designed to assist in the planning needed to enhance schoolyard habitat for wildlife, this program gives students the opportunity to participate in a community service project by planting native vegetation that provides food, shelter and nesting sites for migratory birds and other animals.

### **Plymouth Elementary School, Plymouth, NH**

Read about a successful habitat enhancement project that Plymouth Elementary School students participated in to improve their schoolyard habitat for migratory birds and other wildlife.



## Hubbard Brook Research Foundation

# Enhancing Migratory Bird Habitat: *Plymouth Elementary School Students Participate in a Service-learning Project*





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Improving your schoolyard's habitat for resident and migratory birds can be done in a relatively simple manner: students can enhance stopover sites for migratory birds by providing them with the essentials of water (a shallow dish), cover (brush piles), and food. Communicate with the administration and groundskeeper at your school to ask that dead flowers (from plants such as coneflowers, marigolds, cosmos, and sunflowers) be left on the plants, as birds will feed on the seeds. Ask if students might put out a variety of seed feeders during migratory periods, along with cut or dried fruit.





Alternatively, students can participate in a more involved approach by planting native vegetation that provides food and shelter for migrating and resident birds. Plymouth Elementary School (PES) in Plymouth, New Hampshire, did this in the spring of 2010, when approximately 250 students from grades 4–8 planted 300 native trees and shrubs to enhance the schoolyard habitat for migratory birds and other wildlife. Staff from the USDA-Forest Service at Hubbard Brook assisted the school by developing a list of native plants useful to songbirds. Using this list (included on page 3) as a resource, teachers, students, parents, and faculty from Plymouth State University worked as a team to purchase native trees and shrubs with money from a grant received by NH Fish and Game.






If you are interested in organizing such a project, all that is needed are volunteers who are willing to get their hands dirty, information on the native plants that are beneficial to migratory birds in your area, and funds to purchase plants. If the plants in the table provided are not appropriate to your region, your state extension office should be able to help identify appropriate native plants. Many grants are available for teachers trying to incorporate environmental education into their curriculum and for schools trying to 'green' their campus; a useful place to start looking is the [Grants Page](#) of the North American Environmental Education web site. Places such as the [NH State Forest Nursery](#) are excellent resources to buy native bare root seedlings at an economical price.

During the planning process for the PES school yard habitat enhancement, members of PES also participated in a program called [Project HOME: Homes for Wildlife in the Schoolyard](#). Project HOME gave participants the planning tools needed to develop the schoolyard habitat and create an outdoor classroom. Over 40 community participants, teachers and students met over several evening sessions throughout the school year to learn about the school's specific habitat and to plan locations for plantings as well as a nature trail that now serves as an outdoor classroom. All along, community members, partners from PSU and parents supported Project HOME by sharing their talents and time. The discussions generated by the HOMES workshop nicely complimented the decision making surrounding the use of the grant money received from NH Fish and Game.

Songbird Plants - Trees	Songbirds Attracted	Desirable Features
<p><b>Eastern Hemlock, <i>Tsuga canadensis</i></b></p> 	<p>Veery Insectivorous feeders Like warblers</p>	<p>Grows well in NH, excellent year round cover, needles, cones and seeds attract range of insects desired by songbirds. Can get to be 80' tall.</p>
<p><b>Northern White Cedar (Eastern American Arborvitae), <i>Thuja occidentalis</i></b></p> 	<p>Warblers</p>	<p>Grows well in wet soils, mid sized tree that provides year round cover for wildlife. Cones produce minute seeds consumed by insects and birds.</p>
<p><b>Black Cherry, <i>Prunus serotina</i></b></p> 	<p>Songbirds and other wildlife</p>	<p>Full flowering tree that attracts spring insects. Fruit widely used by forest wildlife. Mid sized shade intolerant tree.</p>
<p><b>Juneberry (Shadbush), <i>Amelanchier spp.</i></b></p> 	<p>Gray Catbird Wood Thrush Veery Songbirds</p>	<p>First woodland understory tree to flower in spring. Small tree with dry fruit consumed by songbirds and twigs browsed by animals.</p>

Songbird Plants – Berry Producing Shrubs	Songbirds Attracted	Desirable Features
<p><b>Common Winterberry Holly,</b> <i>Ilex verticillata</i></p> 	Wood Thrush	Bright orange or red berries by early autumn that persist into winter used by many species of songbirds and Mammals. Likes wet soils.
<p><b>Alternate Leaf Dogwood,</b> <i>Cornus alternifolia</i></p> 	Veery Wood Thrush Red-Eyed Vireo	Flowers May to June with blue/black berries in clusters eaten by many songbirds. Shade tolerant native of poor soils.
<p><b>Red-osier Dogwood,</b> <i>Cornus sericea</i></p> 	Songbirds and other wildlife	Small to medium sized shrub with red twigs. Grows well in wet soils, good for erosion control. White berries in July and August preferred by many woodland birds.
<p><b>Silky Dogwood,</b> <i>Cornus amomum</i></p> 	Veery Wood Thrush Songbirds	Good for windbreaks, erosion control, hedgerows, tolerates poor soil. Bluish fruits bluish in color, important source of food for migrating songbirds. Twigs good winter browse.
<p><b>Gray Dogwood (Red-panicle Dogwood),</b> <i>Cornus racemosa</i></p> 	Veery Catbird Red-Eyed Vireo	Small white flowers in June, songbird favorite, red leaves in fall with cluster of white berries. Can reach up to 15'.

<p><b>Song bird Plants – Berry Producing Shrubs</b></p>	<p><b>Songbirds Attracted</b></p>	<p><b>Desirable Features</b></p>
<p><b>American Highbush Cranberry,</b> <i>Viburnum trilobum</i></p> 	<p>Wide range of songbirds including grosbeaks and finches, grouse and turkey</p>	<p>Wet to well drained soils can be used in hedges or as individuals, mid sized, red berries retained through winter .</p>
<p><b>Northern Wild Raisin,</b> <i>Viburnum cassinoides</i></p> 	<p>Woodland birds</p>	<p>Well drained to wet soils, small fruit in clusters turn black/blue in late summer and persist into winter.</p>
<p><b>Nannyberry, <i>Viburnum lentago</i></b></p> 	<p>Woodland birds</p>	<p>Moist well drained acidic soils, large berries turn black/blue in fall and persist into winter, can get to 30’.</p>
<p><b>Common Elderberry,</b> <i>Sambucus canadensis</i></p> 	<p>Songbirds</p>	<p>Tolerant of poor and dry soils, good for shrub border, favored by migrating birds and mammals.</p>
<p><b>Chokeberry, Black,</b> <i>Aronia melanocarpa</i></p> 	<p>Songbirds</p>	<p>Can root sucker and form large clumps, likes wet soils, white flowers in June, black berries August-November.</p>

Songbird Plants – Capsule and Seed Producing Shrubs	Songbirds Attracted	Desirable Features
<p>Buttonbush, <i>Cephalanthus occidentalis</i></p> 	<p>Warblers Red-Eyed Vireo Veery Wood Thrush Tree Swallows</p>	<p>Tolerates wet and poor soil, gets 3-5 feet in height, densely clustered spherical creamy white flowers from June to August, insects feed on sweet nectar of tubular flowers .</p>
<p>Meadowsweet , <i>Spiraea latifolia</i></p> 	<p>Insectivorous Birds</p>	<p>Tolerates wet and poor soil, can form dense clusters, pink to white pyramidal flowers from July to September, cluster of pods filled with tiny seeds that attract insects in fall.</p>
<p>Sweet Pepperbush, <i>Clethra alnifolia</i></p> 	<p>Insectivorous Birds</p>	<p>Wet and poor soil, many small, white, fragrant flowers on a terminal spike, capsule in fall persisting into winter, full of seeds.</p>
<p>Witch Hazel, <i>Hamamelis virginiana</i></p> 	<p>Seed eaters</p>	<p>Woodland shrub that can get up to 30', yellow flowers that bloom in fall, 2 seeded pod with large black seed.</p>
<p>Sheep Laurel, <i>Kalmia angustifolia</i></p> 	<p>Insectivorous Birds</p>	<p>Shrub of poor soils. Pink flowers in clusters among leaves along the stem, May and June, brown round capsule persisting into winter.</p>

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