

LEARNING FROM NATURE IN THE URBAN WILDS

An article entitled “Urban Myths” by Chris Leahy featured in Massachusetts Audubon Society’s quarterly journal Sanctuary inspired two parents at a Boston public school to write about their experience teaching urban children natural science through exploring the wilds in the school’s vicinity. Chris says “Boston wildernesses are, from a naturalist point of view, terra incognita waiting to be explored.” Each year forty to eighty school children at Boston’s Young Achievers Science and Math Pilot School are discovering the truth in this statement firsthand, as the urban wilds and its treasures reveal themselves in the nooks, crannies and vistas they visit and explore.

by Margaret Connors and Bill Perkins



Over the last two years, in weekly excursions during the school year, we have taught a two-hour naturalists’ curriculum that takes place out-of-doors throughout the four seasons. One of us is a biologist by training and business owner of a Roxbury recycling center. The other is an anthropologist and director of a local grassroots environmental organization, the Neighborhood Pesticide Action Committee. We began the “Young Naturalist Project—Learning from Nature in the Urban Wilds” for two reasons: to get kids out running around during part of a long school day, and to provide a learning opportunity that would help to solidify core math and science curriculum by grounding learning in authentic local explorations of nature.

Young Achievers Science and Math Pilot School operates a 9:00 a.m. to 5:00 p.m. school day that integrates regular classes with recreation, tutoring, and community outreach and service in a seamless way. Ninety percent of the 300 kindergarten through eighth grade students come from five Boston neighborhoods—Dorchester, Roxbury, Mattapan, Hyde Park and Jamaica Plain. Over 70 percent of Young Achievers’ children qualify for the free or reduced lunch program and 35 percent have learning challenges. They are all taught the same academic material in the same classroom. Young Achievers believes that every student can learn math and science regardless of their income level and learning challenges. We know each child will do that at a different pace and in a different way, and that they will need different experiences to navigate their own course. This often means learning concepts deeply through many experiences both in-

side and outside the classroom. The Young Naturalist Project is an example of this strategy.

A longer school day affords opportunities for teachers, parents and partners to collaborate in taking their learning out of the classroom. Students have several opportunities each day to go outdoors, get exercise and interact with their physical environment during the daylight hours, unlike many inner-city children who are by afternoon often on buses traveling back to their homes throughout the city. Young Achievers is the only science and math elementary school in the city of Boston. It also happens to be fortuitously situated in what has recently been named by Harvard’s Rappaport Institute as the “Heart of the City,” home to Boston’s greatest collection of parks and open space in the geographic center of Boston.

A walk in the woods and the opportunity to learn of its treasures is not a given for urban children. Many children at Young Achievers are without a backyard or a tree in which to hang a birdfeeder. Even the neighborhood park may be off limits due to safety issues. In their first few times outside, there is a both an excitement and a real fear about both entering and being in the woods. Daily life in urban environments, often unwittingly, teaches children to avoid urban



wilds for reasons of uncertainty about what they make contain. Some of the children, who had no experience being in the woods, believed that bears and wolves might be lurking behind every knoll. Other children were surprised that there could be deer and coyotes living so close to their school.

The urban wilds we frequent are the most unkempt sections of the Arnold Arboretum and the Forest Hills Cemetery; both offer plenty of varied habitats for exploration. In the 265-acre Arboretum, we explore the Bussey Brook Meadow and Hemlock Hill sections. The 275-acre cemetery offers peripheral wooded areas and some untouched pine-covered knolls, wooded and pastoral sections.

The urban wilds are clearly distinct from wilderness, but they are not parks that are cut and filled, shaped, paved and equipped. As Boston Natural Areas Network describes them, they serve as a respite from the built environment and provide places to sit, walk, watch or listen for visual and psychological relief. We might add that they are sufficiently sized and placed in the urban landscape to support a plethora of wild life.

Now into our third year, our students in the Young Naturalist Project have had the opportunity to meet the red fox of Bussey Brook Meadow, observe the tracks of coyotes, raccoons and opossums, and catch sight of the enormous wingspan of a red-tailed hawk flying just a few feet above us. They have climbed the Arboretum's old growth forest called Hemlock Hill, where they observed signs of imminent decimation of this forest of arbor giants by the woolly adelgid aphid and learned of the Arboretum's reforestation solution. They have dug down into a virtual mountain of composting leaves to discover its steaming temperature of 140 degrees

in the dead of last winter's record cold—easily hot enough to cook an egg, so we did! All these urban wild experiences are a short walk from the Young Achievers School, which is two blocks from the congested Forest Hills train station at the intersection of the Boston neighborhoods of Jamaica Plain, Hyde Park and Mattapan.

What has evolved is truly a placed-based curriculum. We teach based on what is in these wilds—and such an approach is anything but restrictive. The possibilities are endless given the changes in seasons and the varied geography, geology and habitat settings at the various sites. All within walking distance from the school are a healthy stream, a meadow, a pond, a hilltop hemlock forest, white pine groves, and habitats for salamanders, coyotes and fisher cats. In areas where there are fallen trees, we investigate “what's under a log.” When it snows, we study snow crystals under magnification as they fall from the sky, documenting the temperature, wind velocity and the various crystal patterns found under these conditions.

We teach the class to the same children over two consecutive years, instilling in them basic natural science principles and engendering a sense of intimacy with the places they have come to know. Two consecutive years visiting the same spots affords them the time needed to sort out some of the patterns and intricacies of these small but immensely complex and varied natural worlds.

We have discovered that by opening the door to the outside world, the children open up their senses in ways they have not done previously. They become intensely curious about everything, are inspired to observe the natural world around them and feel comfortable being a part of it. By helping



ing them experience popping seeds, the intricate nest building of birds, snow crystal and hoarfrost formations, we hope to instill in them both excitement and the urge to look deeper. Through engaging their curiosity, we also encourage them to apply scientific inquiry to their daily world as a tool for better understanding the larger, natural/scientific and

manufactured/technical world they live in. We believe that grounded field experience about natural systems at their age will give them an absolute advantage in science classes later on. We also believe that the ability to make connections between that experience and a body of knowledge such as science is often the necessary catalyst in producing a confidence with the material that triggers an interest in higher education. This kind of curriculum also fosters an interest in environmental social activism, which can be pursued further in Young Achievers Middle School Community Internships program.



We have found that not only does learning by doing enhance knowledge acquisition, but also that learning through physical activity appears to be a more productive way for some children to learn. In the first year, we discovered that the children who were the most challenging in the classroom setting were among the most engaged in the Young Naturalist Project.



Moving around and expending energy actually helped them focus and when focused they could readily engage. Research has shown that more physical exercise can create

better learners and that exploration and adventure in learning can engage children in exciting ways. The Association of Experiential Education suggests authentic learning experiences occur when learners are engaged intellectually, emotionally, socially and physically. We have applied this philosophy and methodology throughout the program, at the same time recognizing the opportunity for spontaneous learning along the way.

The short-term success of the Young Naturalist Program is measured by having the children demonstrate what they

have learned over the year. For the last class we have designed an hour-long scavenger hunt quiz in which students are given clues to questions they must answer about topics covered in the program. Each clue solved gets them to the next clue. Through this teamwork approach, we discover what they have learned, they feel a sense of mastery over the material, and we can finetune the curriculum based on what and how they communicate.

The long-term success of this program becomes evident as children grasp that exploration yields both results and discoveries. By program end, they are answering many of their own questions through observation and excitedly sharing their findings with the class. They learn respect for nature and the animals that live there. By the end of the year they are no longer throwing their snack trash along the way, but picking up other people's trash with an understanding that to leave it cleaner is making a contribution to the environment and their enjoyment of it. They learn what it means to "observe but don't disturb." With so many of Boston's urban wilds at risk of disappearing, it is important to take care of the ones already protected so that they can continue to teach us for years to come. Forty to eighty children from an urban public school now take home this lesson every year.

The Boston community has a great need for active community members to advocate for their environment and the protection of resources by participating through stewardship, political action and sharing of knowledge. We trust that the Young Naturalist Project will encourage our students, their teachers, and their families to become much stronger members of their Boston community and better advocates for our neighborhoods. □



For additional information on the Young Naturalist Project please contact Margaret Connors at 617-522-0205, or by email at mconnors@cybercom.net.

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PIAD offers, but that was really all a means to an end. Perhaps what is most interesting about this experience isn't the actual details of what I did or learned but rather that two things happened there that changed my life.

A new understanding of my responsibility—Changing my role as an educator

I had begun my graduate studies thinking I would end up being an environmental educator who dedicated her life to teaching children about the natural world. My path seemed clear until I met Dave. He was teaching hundreds—if not thousands—of school aged children by training their teachers. Dave, through his own enthusiasm and understanding of energy and climate change issues, was inspiring teachers to incorporate these important local and global issues into their classrooms. The rich discussions we had on the craft of teaching, my research into energy and sustainability, provincial science standards, and developing curriculum began a new chapter in my own education. Together, we had started answering my question; how can I teach others about global sustainability? Dave helped me turn every scrap of information into my learning library and each experience into a laboratory experiment. I was able to see connections between my own personal transportation choices and the fate of the Cree Nation. I could apply my background in plant science to understand how solar panels operate. The link between workers' quality of life and the environment's health became clear. Most importantly I could see how I fit into this web of energy.

Taking the learning beyond self

This process that began with investigation and a growing curiosity moved toward personal reflection and an increased understanding of my responsibilities as an educator and global citizen. One of the things I wish for as an outcome of any lesson or unit of study is that the learner can take the knowledge and apply it outside the confines of a classroom. Stimulating the mind is just one piece of learning; I intend to awaken each student's heart and sense of caring as well. What is the purpose of education if it is not to facilitate experiences that help the learner access information, develop critical thinking skills, and practice citizenry that inspires them to become involved in their communities?

Years later, I realize that I had taken my learning beyond thinking about energy as an environmental issue to a global issue with impacts on the social, political, cultural and economic landscape as well as the natural world. I had become invested not only in my own success as a student but also in the PIAD educational programs and in teaching others about energy and climate change. As a matter of fact, the first unit that I helped fourth and fifth grade teachers develop was on alternative energy in Vermont. My fellow graduate students, who had comparable service-learning experiences with organizations around the country, seemed similarly inspired as several have gone on to work in renewable energy fields, the protection of the Arctic National Wildlife Refuge, and teaching others about global climate change.

This experience truly could have been about another issue—water, food, human rights. What still rings true and what I hope to offer other learners is a seed of wonder, a connection to a commu-

nity and its multiple perspectives, an opportunity to make a difference and to take the learning beyond the personal. Thankfully, not every life-changing experience begins with sub-zero temperatures!

Making the individual a sharer or partner in the associated activity so that he feels its success as his success, its failure as his failure, is the completing step. As soon as he is possessed by the emotional attitude of the group, he will be alert to recognize the special ends at which it aims and the means employed to secure success. His beliefs and ideas, in other words, will take a form similar to those of others in the group. He will also achieve pretty much the same stock of knowledge since that knowledge is an ingredient of his habitual pursuits.

John Dewey, *Democracy and Education* □

Discovering, cont'd. from p. 5

Who does this community include and, perhaps more importantly, who is being left out?

The *raison d'être* for my essays in the *Journal* is “community discovery,” so the meanings we bring to the term community matter a great deal to me. In Vermont the definition of community seems pretty clear cut. The smallest unit of government here is the town, which translates as township in other parts of the country. As you drive along the interstate you'll see a sign announcing the town of Randolph, and there's nothing there—the sign is simply identifying the boundary of an administrative district. These are significant boundaries, though, because towns are self-regulating with their boards of selectmen and town constables, and they carry the authority to maintain their own roads, levy their own taxes, and operate their own schools. There are 251 of them in the state of Vermont. Each is self-governing and each has its own unique sense of identity. Surely in this instance “town” and “community” are synonymous.

Yet within every town there is much diversity, some of which can be polarizing. There is much talk in Vermont about the tensions between flatlanders and woodchucks, which is to say between the people who moved here from somewhere else and those who've lived here right along. Then there are the social class distinctions between the old families with money (who often live “on the hill”) and the so-called “trailer trash” families who have never accumulated wealth. In many Vermont towns there were also historic divisions between the Protestant families descended from English immigrants, the more recent French-speaking Catholic immigrants from Quebec, and in towns such as Swanton, the historic Abenaki families whose presence predates either group of Europeans.

This is not to say that Vermont towns are divided up into warring camps. On the contrary some volunteer fire departments successfully incorporate “immigrants” from New Jersey and Catholic-Protestant tensions are largely a creature of the past. On the other hand, community as defined geographically by town is just one way of cutting the pie, and the community that comes into

Discovering, *cont'd. from p. 32*

view here is complex and varied. We can feel a sense of identity as a town in the same way that we can feel a sense of identity as a state or as a nation. But, additional “groups” of people also feel a sense of common identity—of community: people of color, evangelical Christians, dairy farmers, gay and lesbians, Greek Americans, and NASCAR enthusiasts.

My point here is that no single definition of community will do because community means so many different things and it means them all at once. I’m not suggesting that this is a problem, because it isn’t. Rather I’m working my way round to advocating for community ethnography as a means of—you guessed it—discovering community. Since I know rural culture best, I tend to deploy my ideas in a rural setting, but that’s just for the benefit of explanation. In any location, ethnography (the study of cultural experience through interviewing, participation, and observation) offers a method for exploring how the concept of community plays out in the lives of real people. In the town of Pittsford where I now live, the village center is clearly the hub of the physical community. An ethnographic research project focusing on Kamuda’s general store, the post office, and the Maclure Library would reveal how this village center works.

Likewise the village includes several church communities, and St. Alphonsus Church parish encompasses much of the local French Canadian, Irish, and Polish immigrant communities. There is a community of parents that are involved with Lothrop Elementary School, not to mention the occupational community of teachers and staff that works within the school. The volunteer fire department represents a tight-knit community, and the Pittsford Historical Society and its activities are emblematic of the Pittsford community as a whole. My neighborhood on Mechanic Street is its own community and my husband’s network of cousins traces yet another community within the boundaries of the town.

I’m just warming up here because the networks of community that give meaning and order to our lives are legion. You may think that you know the place where you live well, and undoubtedly you do. But there’s always more to discover and it’s often right in front of your nose. You just need to go looking. Because you can’t discover community, on your own or with a group of students, unless you go out into the place where you live and start talking to people. They’ll tell you everything you need to know because they are the experts on their own lives. And you ‘ll be amazed at the diversity and complexity, the dignity and intelligence, and the richness and excellence of everyday life. □

Place, *cont'd. from p. 7*

I’ve put an emphasis on beauty—my syllabus is graphically attractive, the leaves are presented in wicker baskets, the outdoor seating is arranged for coziness and to facilitate focus. I want students to feel comfortable, challenged and refreshed. I want my practice to embody what I preach.

My last class of the day is Problem Solving Science. Whereas the Place-based Education class is for first semester students, the science class is for last semester students in our four-semester (fall, spring, summer, fall) program. These students are in their second

internship, eager to be done and have their own classrooms. My class is the last of the week at the end of Friday afternoon. Talk about senioritis! Therefore it has to be both fun and relevant, and though I try hard, I am not always successful.

Only about half of these students have taken the Place-based Education course, so we start with a similar natural science approach but then go off in different directions. This year I start with a study of mushrooms. Trees are conventional, friendly, recognizable—an easy place to start. Mushrooms, on the other hand, are weird, smelly, hallucinogenic and poisonous, and not normally part of the elementary curriculum. But mushrooms and all fungi are decomposers; they complete the nutrient recycling that the trees and other photosynthesizers started. They wrap things up and give things a new start, so they’re poised at the same point in the ecological cycle as the finishing students in my program.

Since most of my students don’t have much knowledge about mushrooms, they’re put in the same role as elementary students. And the oddness of mushrooms makes them an interesting curriculum development challenge. But I’m not really trying to get my students to teach about mushrooms; I want them to understand that our study of mushrooms is a prototype for how to approach any natural science topic—insects, rocks, butterflies, salamanders, gerbils. The rules of engagement are roughly the same. Finally, mushrooms make a good choice for the beginning of the fall semester because that’s when they’re prolific and it gives us all a good excuse to be outside in the woods before the tough sledding of November through March. (When the weather turns, we head inside and focus on physical science—clay boats to teach weight, volume and density; simple machines; light and sound; paper towel testing to teach the scientific method; and sometimes paper airplanes.)

We start by talking about science curriculum they will use for their classrooms in the next couple of months. We’ll be planning curriculum, addressing the standards, and creating assessments, so the first thing I try to make clear is that the course is designed to serve their science planning needs—a laboratory for their elementary classroom teaching. Matt describes the plan in his sixth grade class to have the mandated study of geology focus on the slate mining history in his town of Guilford, Vermont. We consider the possibility of having his students make their final presentation to our graduate class. Cara enthuses that she’s going to get to teach the oceans curriculum that she designed in the Integrated Learning class in her fourth grade internship in New Castle, New Hampshire. The rocky intertidal shore is just a stone’s throw from the edge of the playground at her school. Jana explains that since her inner-city school in Boston does an integrated social studies curriculum on immigration in the fall, and an integrated science unit in the winter, it’s going to be hard for her to do much science. So we brainstorm science topics that might actually enhance the immigration unit.

With the context set, we launch into mushrooms. A blank chart for mushroom terminology and mushroom questions is posted on the front wall. I delicately distribute beautiful white mushrooms in all stages of maturation to pairs of students in the class along with

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Three events representing elements within a coordinated system of professional development opportunities offered in partnership by Shelburne Farms, Community Works, and the Vermont Folklife Center. Each event is distinct in content, while sharing purpose, conceptual unity, and nationally recognized faculty members. All events are appropriate for K-16 teachers, administrators and community educators.

◆ **Principles and Best Practices of Place-Based Education**

June 22-24, 2005 at Shelburne Farms, Vermont

A practical framework for integrating the local community in curriculum.

CONTACT: Pat Straughan, 802-985-8686 x43, or pstraughan@shelburnefarms.org

WEBSITE: www.shelburnefarms.org/educationprograms/professional.shtm

◆ **Discovering Community: Students, Digital Media, and Place-Based Learning**

July 11-15, 2005 at Vermont Technical College

The tools and means for building students' knowledge and relationship to community.

CONTACT: Greg Sharrow 802-388-4964 gsharrow@vermontfolklifecenter.org

WEBSITE: www.discoveringcommunity.org

◆ **Summer Institute on Service-Learning**

August 1-5, 2005 at Shelburne Farms, Vermont

Service-learning best practice and education for sustainability.

CONTACT: Joe Brooks at 802-655-5918 jbrooks@vermontcommunityworks.org

WEBSITE: www.vermontcommunityworks.org

Place as the Context—Service-Learning as the Strategy—Sustainability as the Goal

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an observation sheet taken from Ellen Doris' wonderful book, *What Do Scientists Do?* Their task is to complete an accurate pencil sketch of their mushroom, notice distinctive features and record questions they have about their mushroom or fungi in general. A sedate quiet settles over the room as they become immersed in drawing, but questions start to spill out as their drawings take shape. What are these funny rough spots of the cap? There's a slug in mine; is it eating the mushroom? Is this mushroom poisonous? Should I be concerned about touching it? What's the difference between a mushroom and a fungus?

Drawings completed, we discuss the observations as a group and we start to collect a list of mushroom terminology—the vulva is the sac at the base of the mushroom; the veil is the skirt of tissue on the shaft of the mushroom below the cap; the cap is convex on some but flat on others; the rough bits of tissue on the cap are called warts. Slowly we enter into this new world.

I lay out all the *Amanita virosas* on one table and all the *Amanita citrinas* on another table and ask a couple of students to put each group in order from youngest to oldest. (No names have been attached to any of the mushrooms at this point.) It's an interesting task because it's not a function of size. Rather you have to look at the shape of the cap, the character of the flesh, the shape and integrity of the veil. Without my telling them how to figure this out, a consensus emerges, and we have started to create a visual representation of the fruiting and spore-producing phase of the mushroom life cycle.

By this point, everyone is anxious to know what we've been looking at. I read an excerpt from an elegantly illustrated version of the fairytale *Snow White*. It's the section where the enraged Queen retires to her secret laboratory in the dark recesses of the castle and concocts a poison apple that will kill Snow White even if she just takes one bite. At this point, I circulate around the room to show everyone the illustration of the witch's lair. There on the workbench are deadly nightshade, a mandrake root and the white mushroom we have been looking at—the Destroying Angel.

Everyone is a bit shocked that we have been working with a deadly poisonous mushroom. But I have chosen to work with Destroying Angels to create a bit of cognitive dissonance and to assure that I have everyone's attention. I clarify that mushroom toxins are not absorbable through the skin. But to drive home the seriousness of not eating mushrooms to children I suggest that whenever children handle mushrooms, they be required to wash their hands afterwards. Now, of course, there's lots of interest in the class on how you determine the edibility/toxicity of mushrooms we're going to find.

By 7 pm I am mostly alone in the building as I collect the mushroom detritus for appropriate disposal, clean the classroom and make notes for next week. It's been a long but rich day of immersion in the water, leaves, fungal flora, classrooms and educational issues of the Monadnock region. The mycelial threads of place-based education are beginning to spread out from the Integrated Learning program into rural and urban schools across New England. □