

Stewardship Through Leadership: Backyard Adventures!



PROGRAM HANDBOOK

Presented by, Lowell Parks & Conservation Trust in partnership with Massachusetts Audubon Society – Drumlin Farm Wildlife Sanctuary.

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Program Methodology

The Lowell Parks & Conservation Trust (LP&CT or Trust) works in partnership with **Mass Audubon Society - Drumlin Farm (MAS)** to offer an after-school program for Lowell youth, called Backyard Adventures! (BA). LP&CT Project Specialist, Brian Cutler and MAS Teacher-Naturalist, Sally Farrow team up to share their joys and knowledge of the outdoor world. BA serves various sites in the city of Lowell. The 2008 winter-spring semester is being carried out at three sites; Girls Incorporated of Greater Lowell; Citizen Schools, Wang Middle School campus; and our new site at UMass Lowell's after school program at the Bartlett Community Partnership School.

The program is designed with a goal of exposing urban youth to the outdoor classroom where they will build upon their in-school curricula, become engaged in environmental stewardship in their community, and build self-esteem through team and leadership initiatives. It is our obligation to embrace what knowledge students are gaining through their in-school studies and apply this to our field studies through environmental education. BA is geared to maintain a direct relationship to Massachusetts curriculum frameworks, as it is important to us to support specific areas of academia where our students are in need. The LP&CT offers a valuable sense of place in the city of Lowell with its extensive experience in urban land conservation and strong community networks, while MAS's Building Conservation Communities (BCC) program brings to Lowell its extensive knowledge and skills through their teacher-naturalists, education program materials, and program animals.

Lesson plans are designed to correspond to subjects within curriculum frameworks of Science and Technology/Engineering. Within the Science and Technology/Engineering subject the following areas are focused on in order of greatest concentration: Life Sciences (Biology), Earth and Science, and Technology and Engineering. The BA program places great emphasis on stewardship through team and leadership initiatives, which provide students with the skills, knowledge, and experience they need to be successful when taking action to protect the natural environment improve their community, and succeed in the professional world.

Backyard Adventures! is an environmental education program, which connects Lowell youth to the various natural resources the city has to offer; in their own backyard. The geology of Lowell is special, as it is an important feature of the Merrimack Valley. Two major rivers, the Merrimack and Concord (Musketcook), run through Lowell, their confluence is located in the downtown area. The Merrimack once continued past Lowell to Boston, but with the retreat of glaciers during the turn of the ice age they deposited debris, which filled in much of the Merrimack Valley, thus diverting the river northeast from Lowell to Newburyport. The glacial retreat left behind several drumlins in the area including Fort Hill and Christian Hill (the site of Spring 2007 and Fall 2007 BA programming at the Robinson Middle School). Both rivers have been utilized extensively throughout the course of history; by Native Americans, early colonial

farmers and fishermen, by travelers and transport companies, hydroelectric power, cultural events, and recreation. The rivers are also the roots of the industrial revolution in New England. Throughout the city you will find dozens of parks and open spaces, various wetlands, recreation trails, and an extensive list of urban wildlife. The LP&CT alone has protected over 30 acres of open space in Lowell and owns the historic Spalding House (circa 1760), the LP&CT's future environmental education center. Lowell also shares 252 acres of the Lowell-Dracut-Tyngsboro State Forest (1,140 acres) in the northwest corner of the city. The LP&CT begins construction (Spring 2008) of the Concord River Greenway (CRG), a multi-use bike trail stretching 1.75 miles through the green heart of the city. The trail will complete missing links in several trail networks, such as the Bay Circuit Trail, the Bruce Freeman Rail Trail, the Merrimack River Walk, and the Canal Walk. With its improved access to the river and historic signage, it will also serve as an outdoor classroom for the BA program and various LP&CT events.

While a great deal of our curricular focus encompasses natural science and biology, environmental history and sense of place in Lowell prove to be just as important. The urban sprawl of the industrial revolution clearly shaped the landscape of the city and greater region, though it should not overshadow prior eras. A close look at the Bartlett school neighborhood reveals its close proximity to the epicenter of multiple facets of the historical timeline of the Merrimack Valley.

Before the arrival of the Europeans, the Pawtucket Falls of the nearby Merrimack River provided valuable fishing grounds for the Pawtucket and Wamesit tribes of the Pennacook Nation. Just upstream of the falls, indigenous peoples would hold a torch over the sides of their boats to attract sturgeon to the surface for an easy catch. Today the sturgeon population, among other species, in the Merrimack dwindles due to habitat loss and pollution. During early colonial years, the forests of the area were logged making way for the agrarian community of East Chelmsford to flourish. The Pawtucket Falls made a difficult passage for travelers and shipping companies to navigate, thus leading to the eventual construction of the Pawtucket Canal (The canal defines the rear property line of the Bartlett School). Before the canal was completed in 1796, the Spalding House, then known as the Moses Davis in, served as a resting place for weary travelers who had no alternative but to portage their barges around the falls. The Middlesex Canal (Chelmsford to Charlestown) was completed in 1803, essentially rendering the Pawtucket Canal obsolete. The incorporation of Lowell came about through the revival of the Pawtucket Canal, which led to the creation of a network of power canals serving textile mills through the mid-twentieth century. The collapse of the textile industry in Lowell came about due to the relocation of corporations to the south. This opened doors for change and innovation. Lowell now boasts being one of the most culturally diverse cities in America and is home to the roots of the Interstate-495 technology belt.

These historical sites, natural features and habitats are explored, mapped out, and analyzed by the students through site visits, presentations, and creative approaches. Students collect their observations, historical data and facts to determine the effects of urban development. How do the positive impacts of urban development compare to the negatives? One topic of discussion that consistently raises questions in urban development would be river dams. In Lowell we compare the Pawtucket Dam on the Merrimack River to the Centennial Dam on the Concord River.

We ask the students to make some considerations: What did the rivers look like before the construction of the dams? How were the rivers changed? How have the dams

contributed to local industry? What are the environmental consequences of dam construction on wildlife, vegetation, and pollution? How are animals able to adapt to such environmental changes? How are the dams and rivers still in use today? Do the dams pose hazardous conditions? What sustainable measures can we take in the future, such as fish ladders or dam removal? What would happen if the dams were removed?

We believe environmental history and sense of time and place should be explored and evaluated in depth, simply because it allows our students to develop as stewards of the earth. Between all the various open spaces, the cities rich environmental history, and the cooperation between the LP&CT and MAS, Lowell has all the right resources in place to facilitate much needed environmental education programming, being Backyard Adventures!

The need is clear in the subject of Science and Technology in Lowell, as the results of MCAS Tests of 2007 at the Wang and Bartlett schools show that more than seventy-five percent of students need improvement or are warning/failing. BA programming supports Science and Technology by cultivating an “all senses used” approach to understanding how the earth functions as one organism and the ways in which we can protect it. Middle school students will enter a series of lessons that convey a basic understanding of the interrelationships found in the natural environment, through hands-on exposure. At the high school age level our aim shifts to a more action-based approach, which accomplishes community improvements through the use of technology for data collection and analysis, physical projects, and community outreach initiatives. Exposing our youth, Lowell’s future leaders, to the outdoor world is the basis of BA, supported by interactive lessons from geology to ecology, and provision of the tools our youth need to create positive change in their community that will benefit the entire world.

Fall 2007 Lesson Plan Overview

(In Collaboration with Citizen Schools programming)

Backyard Adventures! (BA) Apprenticeships are conducted by **Citizen Teachers (CT)**:

Brian Cutler, Project Specialist of the Lowell Parks & Conservation Trust (LP&CT) and Sally Farrow, Teacher-Naturalist of Mass Audubon Society – Drumlin Farm Wildlife Sanctuary (MAS)

Site: Citizen Schools, presented by Community Teamwork Inc., Apprenticeship Program at the Dr. An Wang Middle School, 365 West Meadow Road, Lowell, MA 01854

Dates: September 25 through December 6, Wednesdays, 4:15-5:30pm

On site and off site activity locations: vernal pool, meadow, Lowell-Dracut-Tyngsboro State Forest, and the Merrimack River. Indoor activities include ARK's, which are ecology lessons incorporated with visits from MAS program animals.

Citizen Schools' (CS) mission: is to "educate children and strengthen communities."

The apprenticeship method of teaching is closely tied to the experiential learning cycle. Apprenticeship learning uses this cycle through four stages which can best be described as: *Modeling, Scaffolding, Coaching and Fading*. These are the four teaching tools that help children learn the skills necessary to complete high-quality products of performances.

Modeling: CT's model how their jobs are done in the field and professional settings.

Scaffolding: CT's provide their students with necessary supports or "scaffolding" which will convey how to do the job well.

Coaching and Fading: CT's have provided their "apprentices" with the skills and knowledge they need to do their job well. In this apprenticeship the children learn about the basic tasks and motivations of teacher-naturalists and scientific researchers. CT's coach their apprentices along through the final stages of the semester and gradually hand over the reins.

Wang School Population-

- Urban Youth
- 68.9% Low Income
- 4.9% African American
- 20.4 Asian
- 31.0% Hispanic
- 43.7% White

**Fall 2007 Lesson Plan
(13 students in the group)**

- **Apprenticeship Fair: September 25, present and advertise Backyard Adventures! Program, to be elected by individual students. ARK's with wood turtle, and kestrel.**

Week 1 – 10/2 – Intro to Backyard Adventures! - MODEL

Lesson Objectives:	Learning Objectives:	Activities:
-Learn about our apprenticeship and what a WOW! is. -Introduction to ecology and the world of trees.	-Students will learn about the WOW! process and gain an understanding of what the semester will look like and what our end-of-semester WOW! presentation might look like. -They will select a tree in the school yard and monitor its progress throughout the changes of the season.	-Play a get to know ya' game. -Treemendous Trees. Select and visit an 'adopted tree'. To be photographed throughout the semester to display changes. -Discuss last semester's WOW! and see what it looked like (for inspirational purposes.) -Mapping out Lowell. -Life of a Mouse ARK, explore the life of a mouse.

Week 2 – 10/9 - MODEL

Lesson Objectives:	Learning Objectives:	Activities:
-Exploration of the Lowell-Dracut-Tyngsboro State Forest. -Forest ecology.	-Students will learn about and gain exposure to a typical mixed forest habitat of southern New England.	-Visit with adopted tree. -Hike in the LDT State Forest.

Week 3 – 10/16 - MODEL

Lesson Objectives:	Learning Objectives:	Activities:
-Exploration of a freshwater ecosystem. -Freshwater ecology.	-Students will explore and collect data along the banks of the nearby Merrimack River. -They will form analysis on river conditions based on their findings.	-Water testing. -Collection of freshwater macroinvertebrates, etc. -Group analysis of findings. -Discussion of what it means to be a teacher-naturalist.

Week 4 – 10/23 - SCAFFOLD

Lesson Objectives:	Learning Objectives:	Activities:
<ul style="list-style-type: none"> -Exploration of the LDT State Forest. -Forest ecology. 	<ul style="list-style-type: none"> -Students will gain an understanding of photosynthesis. -They will learn about the various forest layers, canopy, understory, etc. -They will explore the makeup of a forest habitat with a focus on the habitat of the redback salamander. -They will have the opportunity to learn how to use a map and compass and handheld GPS units. 	<ul style="list-style-type: none"> -Visit with adopted tree. -Hike in the LDT State Forest. -Salamander meander. -Collect data through the use of digital photography. -Orienteering.

Week 5 – 10/30 - SCAFFOLD

Lesson Objectives:	Learning Objectives:	Activities:
<ul style="list-style-type: none"> -Exploration of the LDT State Forest. -Human impacts on the natural environment. 	<ul style="list-style-type: none"> -Students will discuss the environmental history of the forest, human footprint. -They will measure the impact of invasive species. -They will discuss Leave No Trace Ethics. 	<ul style="list-style-type: none"> -Visit adopted tree. -Hike in the LDT State Forest. -Discuss how humans have utilized the forest as a resource through the years and determine the impacts. -Determine how we can better protect the forest through pro-active conservation efforts. -Identify native and invasive flora and fauna. -Discuss LNT ethics and collect litter to be separated into recyclables, compostable, reusables, and waste.

Daylight Savings Begins- November 4.

Week 6 – 11/6 - COACH

Lesson Objectives:	Learning Objectives:	Activities:
-Implement WOW! presentation. -Forest ecology.	-Students will begin preparations on their WOW! presentation. -Student will learn about wetland buffer zones and how they compare to other ecosystems.	-Visit adopted tree. -Discuss plans for WOW! presentation. -Visit vernal pool and identify wetland flora. -Opossum and Critters of the Forest Floor ARK's, explore the lives of animals who live in forests and urban areas.

Week 7 – 11/13 - COACH

Lesson Objectives:	Learning Objectives:	Activities:
-Implement WOW! presentation. -Freshwater ecology.	-Students will continue preparations on their WOW! presentation. -Using their vernal pool samples they will compare their findings to their data from the forest and along the Merrimack River. -Students will learn about the adaptations and interrelations of local wildlife and ecosystems.	-Work on WOW! presentation. -Visit adopted tree. -Pull samples from vernal pool. Collect and analyze data. -Corn snake, and African Frog ARK's, explore the lives of animals who live in and around wetlands.

Thanksgiving Break- No Apprenticeships, 11/20/07.

Week 8 – 11/27 - COACH

Lesson Objectives:	Learning Objectives:	Activities:
-Work on WOW! presentation. -Ornithology.	-Students will piece together their data and creative works for their WOW! presentation. -They will learn about the world of raptors.	-Visit our adopted tree for the last time. -Students decide to create their WOW! presentation through a display board with art work (leaf rubbings, color collage, wildlife drawings, etc.) conveying their appreciation for the beauty of the forest with all its wildlife and hidden secrets. A Power Point

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		slide show will also be created displaying the semester's objectives, activities, joys, and data that was collected. Also on the presentation with maps and information promoting community connection and visitation to the forest land.
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Week 9 – 12/4 - FADE

Lesson Objectives:	Learning Objectives:	Activities:
Complete WOW! presentation.	-Students will debrief the semester and what it means to them through completion of their WOW!	-Discuss the lives of young naturalists. -Complete WOW! presentation, fine tune Power Point slide show and add in photos in succession of our adopted tree, which of course lost all its leaves this fall and created buds ready to overwinter and pop next spring.

- WOW! Fair – 12/6/2007** (The Backyard Adventures! WOW! will be presented among those of several other apprenticeships.)

The students in the Backyard Adventures! Program carried a focus on the importance of trees and the habitats they create. They spent time throughout the semester exploring local habitats and formulating conclusions on their current environmental state. For their WOW! the students decided to create two display boards with artwork and a slide show that convey their love for the natural environment and their understanding of the need to protect it. Over one hundred people from the local community, including the family and friends of our students, attended the fair to enjoy and participate in the evenings activities. We are proud of them for all their hard work and enthusiasm!

Spring 2008 Programming

Bartlett Community Partnership School, UMass Lowell After School Program, Tuesdays, 2:30-3:30pm, 3/24/08 – 5/2/08

The Bartlett school is tucked into a quiet pocket of the city surrounded by a wealth of environmental history. The nearby Spalding House and Pawtucket Canal display the physical changes of human intervention, while the Merrimack River and schoolyard bedrock outcroppings reveal nature's timely adaptations. Through research and observation, Bartlett students will document these changes, weigh the pros and cons of urban development, and draw conclusions about the current environmental state of the neighborhood. They will have the chance to meet Mass Audubon's program animals representing local brumators and migrators, such as a corn snake, snapping turtle, and Canada goose. As a follow-up to the semester students will formulate methods of action to improve the local habitats, while preserving historical features.

Dr. An Wang Middle School, Citizen Schools Apprenticeship Program, Tuesdays, 4:15-5:30pm, 2/12/08 – 5/6/08, 5/8/08 (WOW! Fair)

This semester's Wang school students will form a connection to the jewels of the land in the city of Lowell through field studies of local state forest and wetland ecosystems. They will gain exposure to program animals from Mass Audubon, and participate in action-based projects. These leadership opportunities will provide them with the skills and tools they need to be stewards of their community.

As a semester follow-up to the Citizen Schools Apprenticeship Program, students will develop formal presentations to be displayed and carried out during what is known as the WOW! Fair. This is the students' opportunity to model for their family and friends the professional skills and knowledge they acquired throughout the apprenticeship.

Girls Incorporated of Greater Lowell, SMART Classes (Science, Math, and Relevant Technology), Wednesdays, 4:30-5:30pm, 4/2/08 – 5/28/08

With its downtown location, Girls Inc. is at the heart of the landscape of Lowell's rich industrial history, providing a perfect scenario for subjects like urban ornithology. Birding! Lowell is an amazing place to catch sight of a peregrine falcon stooping into a flock of pigeons, or to spot a Cooper's hawk perched atop a building awaiting its chance to dine on an unsuspecting house sparrow. This semester at Girls Inc. the girls will be learning about the '*survival of the fittest*', the amazing abilities and adaptations of birds. Activities will include visits from Program birds from Mass Audubon, such as the great horned owl and broad-winged hawk, implementation of a neighborhood census of birds, and the creation of a habitat improvement action plan.

Contact Information

- **Lowell Parks & Conservation Trust (LP&CT or Trust)**

Executive Director: Jane Calvin

Address: 11 Kearney Square, 4th Floor, Lowell, MA 01852

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Web Site: www.lowelllandtrust.org

LP&CT Mission: to improve the quality of life for the people of Lowell through the creation, conservation, and preservation of parks, open spaces, and special places.

- **Massachusetts Audubon Society – Drumlin Farm Wildlife Sanctuary (MAS)**

Education Manager: Kris Scopinich

Address: 208 South Great Road, Lincoln, MA 01773

Phone: (781)259-2200

Web Site: www.massaudubon.org

MAS Mission: protecting the nature of Massachusetts.