

Module 1 – Lesson 3 Narrative

Driving Question: What is Urban Ecology?

In previous lessons, we have investigated the history of cities and the characteristics of ecosystems. Now, we can take the next step and put both of these ideas together and consider the study of *urban ecology*. Urban ecology is a new branch of environmental science that seeks to understand the natural systems of urban areas and the threats that face them. Urban ecologists study the trees, rivers, wildlife and open spaces found in cities to understand the extent of those resources and the pressures they face from human development. Urban ecology is *the study of cities as the interactions among biological, chemical, physical and human social forces*.

This means that ecologists can use the same tools to investigate cities as they might use in the study of the saltmarsh ecosystem you read about earlier. Remember, these studies include the flow of energy into and out of an ecosystem and the cycling of matter. These projects also include investigating the conditions under which the animals and plants thrive in their habitat. These investigations can help make cities more livable and sustainable too.

The big change required for ecologists studying urban ecology is the incorporation of the built environment into the analysis. Scientists studying cities from an ecological perspective must also consider the human social factors of neighborhoods. Urban neighborhoods have legacies of human history. Using the perspective that urban landscapes include humans living together in high densities, scientists understand that cities are true ecosystems.



Above left: Dr. Charlie Nilon studies the structure of bird communities in cities and how they are impacted by habitat size and land use. His work in Baltimore is part of the largest study of urban ecology ever attempted. Funded by the National Science Foundation's Long Term Ecological Research Program, the Baltimore Ecosystem Study involves hundreds of scientists working together to understand the ecology of the city (www.beslter.org).

Above right: A male Baltimore Oriole (Icterus galbula). Named for the City of Baltimore, this insect and fruit eating bird living in trees nearby is a symbol of a healthy urban neighborhood. Oriole populations are slowly declining – especially in urbanized areas. City parks can be critical nesting habitat for this species.

The world's population is growing rapidly. As a species, we are technologically very advanced. Large human populations have the least impact on the global ecosystem if they live in healthy and sustainable cities. Urban ecology research is helping people see their city in a new way. Cities are a living ecosystem with valuable resources that promote better health and quality of life. The information produced by urban ecologists help urban residents and policymakers make informed decisions. Urban ecosystems can be examined through a variety of lenses, such as biodiversity, soil and water quality, energy, politics, historical legacies, environmental justice issues and, public health. The truly exciting part of the revolution of urban ecology is the role that you can play. Cities are being studied not only by scientists, but by students and other citizens of the city. Understanding our urban ecosystems is a huge project and there is a critical role to be played by the young people that live in these urban neighborhoods. This curriculum will help you see the important part you can play in the health of your neighborhood.



Above left: Students from an after school program in Chelsea are monitoring saltmarsh grasses as part of a restoration project along an urban saltwater stream. This restoration project improved the urban neighborhood and involved citizens of all ages.

Above Middle: Students from Odyssey High School in Boston are monitoring water quality by taking samples from the harbor near their school. The data from these samples are stored in a database that can be used to compare ecological conditions from previous years. This is called a *longitudinal study*, because it is carried out for many years.

Above right: Students measuring the health of street trees in a Boston neighborhood. Street trees are an essential part of a healthy city. Until recently, the City of Boston did not even know how many street trees existed in Boston. With the help of students and other citizens, Greater Boston Urban Forest Inventory was conducted and completed in 2006. Boston has 29,000 street trees and their health has become a priority for the City. Mayor Menino has pledged to plant 100,000 more trees in the next ten years – all with the help of students and other volunteers. Community restoration projects are great ways for you and your classmates to help improve your city.