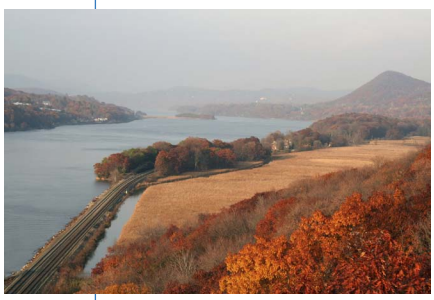
Chapter 1:

# Introduction

## The Hudson River Valley



The Hudson River Valley and its dramatic vistas, healthy forests, and cool headwater streams have been called the landscape that defined America. Nineteenth-century painters Thomas Cole and Frederic Church, poet Walt Whitman, and early twentieth-century writer John Burroughs translated the beauty of the river and its shores into art and literature. The unparalleled scenery of the Hudson Valley comes from its remarkable diversity of plants, animals, and natural areas.

The Hudson is a tidal river where salt and fresh water mix to form an estuary with a watershed that comprises four million acres. More than 600,000 acres of protected woodlands, wetlands, grasslands, and streams, about 16 percent of the watershed, provide refuge to thousands of plants and animals, many of them at risk. The remaining 84 percent of the Hudson Valley—privately owned land, including our own backyards—provides essential habitat for fish and wildlife (Smith et al. 2001). The total variety of native plants, animals, and habitats in the Hudson Valley is part of what scientists call biodiversity.

While of clear scientific interest and importance, natural areas and wildlife are also valued by the region's residents for aesthetic, recreational, and historical values. The estuary and its diverse watershed of mountains, forests, wetlands, and streams create a rich sense of place that is steeped in human history. Native Americans have lived in the valley for thousands of years. Henry Hudson sailed up the river that bears his name in 1609.

In 1749, Swedish botanist Peter Kalm observed the wonder of the river and the diversity of the coastline (Benson 1937):

> " . . . it seems that some rivers derive their first origin from the creation itself, and that Providence then pointed out their course; for existence can, in all probability, not be owing to the accidental eruption of water alone. Among these rivers we may rank the river Hudson: I was surprised on seeing its course, and the variety of its shores."

## What Is Biodiversity?

Biodiversity is also known as biological diversity. Some people associate the term with endangered species, while others consider it a measure of the number of kinds of animals found within a given area. Both are correct, but each is only part of the concept.

Biodiversity is a natural system of all species—plants, animals, fungi, and microorganisms—the habitats where they live, and the broader landscape. Living organisms interact with the nonliving environment to create the self-sustaining system, which will continue to work and provide beneficial services to human communities as long as its components—the species, habitats, and landscapes—are healthy.

## The Hudson River Estuary Action Agenda

The New York State Department of Environmental Conservation's Hudson River Estuary Program seeks to restore and maintain the Hudson's extraordinary natural heritage through programs that conserve natural resources, clean up pollution, and promote public use and enjoyment of the river. One goal of the program is to help communities manage native plants, animals, and habitats in ways that prevent degradation of the Hudson River Estuary ecosystem while supporting human communities. To achieve this goal, the estuary program works with public and private organizations, including dozens of municipalities, conservation groups, universities, and other state agencies.

The estuary program emphasizes public–private partnerships to meet the needs of people as well as natural resource conservation. Recognizing the importance of local decision-makers in conserving the region's natural heritage, the program helps local governments and organizations incorporate biological information into their planning and decision-making. This handbook was created as part of that program to help Hudson Valley communities understand the issues; know their plants, animals, and habitats; and identify tools to conserve natural areas that will work in their communities.

## Purpose and Objectives of This Handbook

The first objective of this handbook is to share information with local government agencies about the relevance and importance of natural areas in their communities and throughout the Hudson Valley region. The second is to identify and point municipalities to local tools and techniques that enable protection of important habitats in Hudson Valley communities.

By implementing some of the tools in this handbook, Hudson Valley communities can become models for communities across the country that are seeking to balance growth with conservation.

## Nature Is Vital

Tidal shores, lowland wetlands, and upland forests provide shelter to thousands of plant and animal species in the Hudson Valley—creating the scenic vistas, fields of fragrant wildflowers, and songs of migrating birds that can be enjoyed in the region. Healthy habitats sustain human communities as well, contributing to our quality of life, our economy, and our health.

When speaking to your community about natural-resource issues, particularly about natural areas and wildlife, it is important to talk about why it matters. This section covers some of the reasons that local biodiversity is important. Use them as appropriate. See Chapter 6 for more communication tips.

### Why Should I Care about Natural Areas and Wildlife?

Diverse natural ecological systems provide a number of beneficial services to human health and our communities.

- Forests, wetlands, and stream corridors work together to keep our water supply clean and abundant.
- Natural areas and open spaces can provide economic benefit through increased tourism and reduced cost of town services.
- Nature keeps your family healthy—by cleaning the air and water, lowering stress, and lessening the risk of disease.
- Plants and animals and the intact natural areas that support them are important parts of community character and local quality of life.
- Protected natural areas and associated wildlife provide vital recreational opportunities.

### Keeping Water Clean and Abundant

Wetlands, stream corridors, and forests work together to clean and store our water. If these natural areas are healthy, they clean our water at no cost to us. That is why New York City was willing to spend $1 billion on watershed protection rather than spend $3 to $8 billion on building a filtration plant. Watershed protection is also the reason New Jersey helped pay for a New York State Park, contributing $10 million to the $55 million purchase of Sterling Forest® State Park in 1997. The other option was spending $100 million on a water-treatment plant. Similarly, in the late nineteenth century, New York State lawmakers had the foresight to create the Adirondack Park, thereby protecting the Hudson's northern watershed. At that time, the lawmakers recognized how important the Hudson River was to commerce in New York; therefore, protecting its watershed was an economic decision.

### Quality of Life

For those of us who live here, we know firsthand the high quality of life in the Hudson Valley. Quality of life is one reason this is the fastest growing region in upstate New York. But what makes the Hudson Valley such a great place to live? Perhaps it is scenic beauty. The innumerable scenic vistas throughout the Hudson Valley instill a sense of awe whenever you stop to look. Upon closer inspection, the vistas reveal an incredible diversity of wildlife habitats. Natural areas, whether public or private, also help define community identity by connecting residents to the natural setting in which they live. A recent national survey of homebuyers found that natural open space, walking and bicycle paths, and gardens with native plants were the three most desirable amenities for residential areas (Lerner and Poole 1999). Hiking, hunting, bird-watching, fishing, and photography are enjoyed by many of the region's residents who use natural areas, whether publicly accessible or in their own backyards.

For some, the mere idea of wildlife in our midst is valuable and contributes to our quality of life. Many people feel a moral and ethical imperative to protect wildlife and the diversity of life from the impacts of development. Reasons for this include a desire to protect other species from extinction, moral values associated with cherishing the earth and its inhabitants, and the desire to leave for future generations that which we are able to enjoy.

"If I were to name the three most precious resources of life, I should say books, friends, and nature; and the greatest of these, at least the most constant and always at hand, is nature. Nature we have always with us, an in exhaustible store-house of that which moves the heart, appeals to the mind and fires the imagination—health to the body, a stimulus to the intellect, and joy to the soul."

*(Burroughs 1908)*

## Economics

Natural habitats and wildlife benefit the economy by attracting both visitors and residents who patronize local businesses. Throughout New York, the economic value of wildlife-related recreation, including trip and equipment costs for hunting, fishing, and wildlife observation was about $3.5 billion in 2001 (U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce 2003). The total value of New York's forest economy is $8.8 billion, including fall foliage viewing, timber harvesting, and the paper and furniture industries (North East State Foresters Association 2007). For the Shawangunk Mountains alone, 500,000 annual visitors contribute more than $10 million in revenue to local restaurants, hotels, and other area businesses (Kerlinger 1996). Fourteen million people visit the New York/New Jersey Highlands Region each year (Phelps and Hoppe 2002). The Hudson Valley's natural open spaces make the region an attractive place to live and work, and enhance the economic and development value of the region.

"Natural areas, parks, and open space create a high quality of life that attracts tax-paying businesses and residents to communities."

*(Lerner and Poole 1999)*

Keeping open spaces open may also have more favorable property tax impacts than once thought. Studies of the cost of community services from the Hudson Valley have shown that open space and commercial development cost towns and school districts less in services than they pay in taxes, while single-family detached housing costs towns and school districts more in services than it pays (Freegood 2002). These results

### Table 1-1. Cost of Community Services Studies in the Hudson Valley

Revenue-to-expenditure ratios are expressed in dollars. The table compares how much residential, commercial, and open space cost the town in services for every dollar in taxes received. (Amenia, Beekman, Fishkill, and Northeast data extracted from Freegood 2002).

| community | residential, including farm houses | commercial and industrial | working and open land | source |
|---|---|---|---|---|
| Amenia | 1 : 1.23* | 1 : 0.25 | 1 : 0.17 | Bucknall 1989 |
| Beekman | 1 : 1.12 | 1 : 0.18 | 1 : 0.48 | American Farmland Trust and Cornell Cooperative Extension 1989 |
| Coxsackie (town) | 1 : 1.21 | 1 : 0.29 | 1 : 0.30 | River Street Planning and Development 2007 |
| Coxsackie (village) | 1 : 1.18 | 1 : 0.47 | 1 : 0.38 | River Street Planning and Development 2007 |
| Fishkill | 1 : 1.23 | 1 : 0.31 | 1 : 0.74 | Bucknall 1989 |
| Northeast | 1 : 1.36 | 1 : 0.29 | 1 : 0.21 | American Farmland Trust and Cornell Cooperative Extension 1989 |
| Red Hook | 1 : 1.11 | 1 : 0.20 | 1 : 0.22 | Bucknall 1989 |

*This means that in 1989, residential development cost Amenia and its school district $1.23 in services for every tax dollar received, whereas commercial development cost $0.25 and open space cost only $0.17.

counter the notion that all new development will reduce the tax burden of residents. It is important to note that studies of the cost of community services look at current and past land use and tax revenue that may not apply to the future. Local tax burden can shift based on a variety of factors, including the mix of development and state aid. Fiscal impact analysis looks toward the future, projecting the tax rates for different growth scenarios over time. A fiscal-impact analysis is based on assumptions including population change, future costs, and local investment in open space. Neither type of study can predict the future, but they may be useful in showing how open space conservation can affect local taxes. The results of several Hudson Valley studies of the cost of community services are shown in Table 1-1. Though study results have been generally consistent across the country, a local study may be required to determine how open space affects taxes in your community. Note that these studies generally exclude economic factors beyond property tax rates, such as tourism, job creation, sales tax revenue, and increased property values.

### Ensuring the Health of Your Family

Healthy habitats, and growth that allows those habitats to stay healthy, lead to healthy human communities. Studies have shown that natural areas reduce stress in children and that car-dependent sprawl is contributing to our nation's obesity problem. But did you know that biodiversity helps to keep Lyme disease at bay? Researchers at the Cary Institute of Ecosystem Studies in Dutchess County have found a connection between healthy forests and Lyme disease in people (Allen et al. 2003; LoGiudice et al. 2003; Ostfeld and Keesing 2000; Ostfeld and LoGiudice 2003). When forests have greater small mammal diversity, there tends to be less Lyme disease in humans. When black-legged ticks hatch, they are not carrying the microorganism that causes Lyme disease. They get it from feeding on a mammal host, usually the white-footed mouse. Other small animal species aren't as likely to carry the microbe, and therefore are not as likely to pass it on to ticks. Where there are fewer white-footed mice, chances are lower that any individual tick has the Lyme disease–causing agent, and is therefore less likely to pass it to people. Larger forests with high small mammal diversity have fewer white-footed mice than fragmented landscapes in suburban areas.

### Letting Nature Do the Work

We depend on nature for many things. Healthy, naturally vegetated natural areas—including forests, stream corridors, and wetlands—provide a number of services that are highly beneficial to humans and ecosystems. Some of the key benefits include cleaner air, cleaner water, pollination of our crops, and productive soil. Best of all, these services are provided for free. These services depend on properly functioning ecosystems, which in turn depend on the diversity of the plants, animals, and microorganisms—biodiversity—that make up those ecosystems. If these services are lost, replacing them with human-made substitutes requires the enormous cost of designing, building, maintaining, and improving these services. And no matter now much time and money is spent on them, engineered systems are rarely as efficient as natural ones.

## Nature Under Pressure

The greatest threat to Hudson Valley biodiversity today is habitat loss and fragmentation. The direct loss of habitat through clearing and paving is obvious, but the effects of fragmenting natural areas into smaller, isolated patches are more subtle. Fragmentation is a result of land consumptive development, also called sprawl.

A healthy economy and high quality of life in the Hudson Valley have created a rapidly developing region. According to a study by Cornell University, most new housing units in the Hudson Valley are expected to be built outside of traditional population centers (Smith et al. 2004), typically resulting in rural and suburban sprawl. The study also showed that future growth will occur in areas that have high reptile, amphibian, and mammal diversity (Smith et al. 2004). Though building is part of a growing population and economy, most of this new development is using up land much faster than the population is growing. Between 1982 and 1997, the Hudson Valley's human population grew about 9 percent, yet urbanized land increased 29 percent (Pendall 2003). Land consumptive development patterns not only threaten habitats on developed lands, but on conserved lands as well, due to the effects of fragmentation. Sprawl-type development can also disrupt groundwater flow and spread invasive species, adding more stress to the ecosystem. As more healthy habitats are lost, the many benefits natural ecosystems provide may be lost as well. Despite these pressures, it is possible to sustain a healthy

economy and a healthy environment by growing and planning with nature in mind.

The region's biological diversity is also threatened by pollution after centuries of industrial production near the Hudson River. The New York State Department of Environmental Conservation's Hudson River Estuary Program is addressing pollution by supporting several studies and cleanup projects. One of these projects locates sources of pollution to the estuary and New York Harbor. Today, the Hudson's water quality is threatened by urban runoff and outdated sewer systems. To address these problems, New York State has invested $50 million in upgrading sewage treatment plants, through the estuary program, to improve water quality, which improves recreational access to the Hudson. The Hudson River Estuary Program's Watershed Project is working with local governments to reduce and treat urban runoff.

> "The diversity of local conditions [in the Hudson Valley]—climate, terrain, hydrology, and biodiversity—suggests that centralized approaches to environmental protection are not necessarily desirable when dealing with environmental problems. By supporting innovation at the local level, citizens are encouraged to define for themselves what is acceptable in their communities."
>
> *(Van Tine 2003)*

## A Critical Role for Local Governments

State and federal laws alone can not protect all of the region's diversity—nor were they intended to. Many important species and habitats are not protected by these laws. The actions of the Hudson Valley's municipalities are critically important for biological conservation because local governments will decide how 85 percent of the land and water resources in the region will be used. Conserving natural resources while growing is a challenge, but one that can be met as long as communities plan for the conservation of fish, wildlife, and plant habitat, and recreation in addition to growth. Conservation of these resources is compatible with other community goals, including smart growth and quality communities, water resource conservation, open space planning, and farmland protection.

This handbook was designed for local land-use decision-makers who want to make better decisions for natural areas and wildlife. All levels of local government—towns, villages, cities, and counties—have an important role in protecting natural areas and wildlife. Coordination among local governments is critical to achieving conservation goals.

## Resources

Johnson, E. A., and D. Smith. [eds.] 2006. *Legacy: Conserving New York State's Biodiversity*. American Museum of Natural History, New York State Biodiversity Research Institute, New York State Department of Environmental Conservation, New York Natural Heritage Program, and The Nature Conservancy, Albany, N.Y.

Johnson, E. A., and M. W. Klemens. [eds.] 2005. *Nature in Fragments: The Legacy of Sprawl*. Columbia University Press, N.Y.

Perlman, D. L., and J. C. Milder. 2005. *Practical Ecology for Planners, Developers, and Citizens.* Island Press, Washington, D.C.