

Summary Report

Losing Ground: At What Cost?

Third Edition of the Losing Ground Series

**Changes in Land Use and Their Impact on
Habitat, Biodiversity, and Ecosystem
Services in Massachusetts**

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TABLE OF CONTENTS

| | |
|--|----|
| EXECUTIVE SUMMARY | 1 |
| CHAPTER 1: INTRODUCTION <i>Why Land Use Matters in Massachusetts</i> | 2 |
| CHAPTER 2: <i>Changes in Statewide Land Use</i> | 3 |
| CHAPTER 3: <i>Housing as a Driver of Land Use</i> | 8 |
| CHAPTER 4: <i>The State of Land Protection in Massachusetts</i> | 13 |
| CHAPTER 5: <i>Land Use Threats to Biodiversity in Massachusetts</i> | 15 |
| CHAPTER 6: <i>Accounting for the Economic Value of Ecosystem Services in Massachusetts</i> | 19 |
| CHAPTER 7: <i>Conclusion and Recommendations</i> | 22 |
| MASS AUDUBON'S LAND PROTECTION STRATEGY | 24 |

ABOUT MASS AUDUBON

The Massachusetts Audubon Society is the largest conservation organization in New England, concentrating its efforts on protecting the nature of Massachusetts for people and wildlife. Mass Audubon protects more than 30,000 acres of conservation land, conducts educational programs for 250,000 children and adults annually, and advocates for sound environmental policies at the local, state, and federal levels. Established in 1896 and supported by 68,000 member households, Mass Audubon maintains 42 wildlife sanctuaries that are open to the public and serve as the base for its conservation, education, and advocacy work across the state. For more information or to become a member, call 800-AUDUBON (283-8266) or visit www.massaudubon.org.

ADDITIONAL COPIES AND TECHNICAL NOTES

Accompanying technical notes provide more detailed data tables and an expanded description of the methodology used for this report. Copies of the technical notes, or additional copies of this summary report, can be obtained by contacting Mass Audubon's Advocacy Department at 781-259-2171, sending email to advocacy@massaudubon.org, or writing to Mass Audubon, Advocacy Department Publications, 208 South Great Road, Lincoln, MA 01773.

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EXECUTIVE SUMMARY

Despite progress in protecting land and a growing appreciation for the natural resources of the Commonwealth, Massachusetts continues to lose ground each day to development. While the rate of loss may be moderating, the impact of development is being felt in regions of the state containing some of our most sensitive rare species habitat and natural communities. And what is being built is becoming less and less sustainable, in terms of larger average house and lot sizes supporting fewer people. The findings are sobering and should be a call to action for citizens and public officials to work together to protect the nature of Massachusetts.

- ▲ Massachusetts continued to lose 40 acres per day to “visible” development between 1985 and 1999, as interpreted from aerial photography. Nearly nine out of ten acres lost were used for residential development; 65 percent of this land was used for low-density, large-lot construction. Twenty-four percent of the state’s land area was developed as of 1999, compared to 17 percent in 1971.
- ▲ When the “hidden” impact of development is taken into account, including most roads and portions of building lots that appear undeveloped in aerial photography, the full level of human impact was closer to 78 acres per day.
- ▲ A review of more recent development between 2000 and 2002 shows that new residential and commercial construction continues to consume forest and agricultural land. We estimate that an additional 40,000 acres were impacted by both visible and hidden development during that period.
- ▲ Average residential building lot sizes have increased 47 percent statewide since 1970, and have more than doubled in some counties, suggesting that when an economic recovery occurs we may see even higher levels of land consumption.
- ▲ Forest loss to development, and therefore habitat loss, was particularly pronounced on Cape Cod and in southeastern Massachusetts. Loss of agricultural land to development was distributed through the I-495 corridor and Connecticut River valley.
- ▲ Just under one million acres of wildlife habitat were permanently protected as of May 2003, or 19 percent of the state’s land area. Seventy-one percent of wildlife habitat statewide lacks permanent protection and is at risk of development.
- ▲ While progress has been made in land protection statewide, many rare species habitat areas, and riparian areas surrounding aquatic species habitat, have little or no permanent protection. Fragmentation threatens most rare species habitat areas. Only 39 percent of terrestrial rare species habitat and 23 percent of riparian areas near aquatic rare species habitat is permanently protected. Two-thirds of what is permanently protected supports multiple uses, including water supply, forestry, and recreation, which may be in conflict with habitat conservation goals.
- ▲ Much of the remaining forest in the state is highly fragmented, but certain areas offer opportunities for protecting the large roadless forest blocks needed for natural system functions and for broad biodiversity conservation.
- ▲ Undeveloped and recreational land in Massachusetts generates more than \$6 billion annually in nonmarket ecosystem services—85 percent of this value is provided by forests, wetlands, lakes, and rivers left largely in their natural state. Loss of these “free” services would result in an increased burden on taxpayers due to the need for additional water treatment, climate regulation, and flood control, as well as reduced property values and tourism revenues.
- ▲ Over \$200 million in annual ecosystem service value was lost between 1985 and 1999 due to loss of forest and agricultural land to development.

At the current rate of development, Massachusetts faces a closing window of opportunity to protect critical habitat areas and address sprawling development before it is too late. We recommend that state and local officials take immediate action on the following fronts.

- ▲ **Open Space Protection:** We call for the state government to restore past land acquisition spending levels through allocation of funds from the Environmental Bond of 2002 as a step toward meeting the goals of the Statewide Land Conservation Plan. The plan has identified one million acres as priorities for protection. We recommend further prioritization to focus short-term efforts on protecting critical habitat areas and natural communities from further development.
- ▲ **Land Use and Development:** We call for meaningful zoning and subdivision regulatory reform that removes loopholes that bypass local review of development. We encourage municipalities to adopt cluster and conservation subdivision bylaws to simultaneously achieve goals of increased open space protection and affordable housing.
- ▲ **Biodiversity:** The state should demonstrate its commitment to endangered species protection and recovery by adding permanent matching funds to the voluntary contributions currently supporting the Natural Heritage and Endangered Species Program. We recommend improved protection of rare species habitat both through land acquisition and identification of areas where recreational and water supply uses may be in conflict with conservation.
- ▲ **Additional Monitoring and Research:** Much of this report is based on digitized land use data funded by state agencies. However, much more frequent and complete updates of both land use and open space data are needed to adequately track progress in land conservation. We also recommend additional ecosystem services research in Massachusetts to encourage a better economic understanding of the “free” services being provided by natural ecosystems.

CHAPTER I: INTRODUCTION

Why Land Use Matters in Massachusetts

Mass Audubon has chosen to make changes in land use the focal point of its current assessment of the environmental health of the Commonwealth. Understanding trends in development is particularly important in Massachusetts, which possesses a number of natural communities and rare species of regional and global significance. Examples include the following.

- ▲ Southeastern Massachusetts and Cape Cod support several globally rare pine barrens and coastal plain pond communities. This region also includes some of the Northeast's largest remaining coastal forests.
- ▲ Southeastern Massachusetts is the location of the largest wetland system in southern New England, Hockomock Swamp.
- ▲ Martha's Vineyard, Nantucket, and other Massachusetts islands support globally rare coastal sandplain ecosystems, including rare coastal grassland, heathland, pitch pine/scrub oak barrens, and oak savannahs, which in turn support a number of rare and endangered species.
- ▲ The North Shore is the site of the Great Marsh, the largest contiguous salt marsh in New England.
- ▲ Southwestern Massachusetts includes the Berkshire/Taconic region. Here large tracts of forest support great biodiversity, including 120 rare or endangered species.

Land use also directly impacts environmental health and quality of life in a number of ways.

- ▲ Land use that results in loss of habitat is the number one determinant of loss of biodiversity, more so than climate change, release of nitrogen, biotic change (such as introduction of invasive species), and atmospheric change.¹

- ▲ Poorly planned land use that results in fragmentation both threatens species and makes other land uses, such as forestry and agriculture, less economically viable.
- ▲ When compared to compact development near city centers, sprawling "greenfield" development results in higher vehicle miles and public infrastructure costs, as well as increased auto emissions.²
- ▲ Land use that is inefficient and sprawling relative to the population it supports, often influenced by local zoning and permitting, can exacerbate the affordable housing shortage in Massachusetts, a major quality-of-life concern for citizens of the state.

What we lose to development each year not only diminishes the natural richness and quality of life that Massachusetts citizens enjoy but also has impact on a broader regional, national, and international scale. We are truly stewards of an irreplaceable natural landscape.

Goals of This Report

This is the third edition of the Massachusetts Audubon Society's landmark *Losing Ground* report, first published in 1987.³ As part of its mission of protecting the nature of Massachusetts, Mass Audubon has published this series to educate policymakers and the public about the impact of continued development in the Commonwealth and to advocate for changes in land protection policy and land use planning. Sixteen years ago, the first edition of *Losing Ground* observed "with unprecedented economic growth has come unprecedented pressure on the open spaces of the Commonwealth—its farmlands, forests, wetlands, water supplies, and habitat." These pressures remain today. Our objective in 2003 is to see if we are gaining, or losing, ground in protecting open space in Massachusetts through an examination of land use, housing, protection of wildlife habitat and biodiversity, and the economic value of nature-based services such as water filtration and climate control.