

# **THE HARVARD FOREST LAND USE MASTER PLAN FOR THE SECOND CENTURY**

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**PREPARED BY  
JOHN O'KEEFE  
AUDREY BARKER PLOTKIN  
DAVID FOSTER  
AND THE HARVARD FOREST STAFF**

## **CONTENTS**

**Executive Summary**

**Preamble**

**Supporting Sections**

- 1. Base Maps**
- 2. Land Use History**
- 3. Natural Resources**
- 4. Research**
- 5. Education**
- 6. Recreation**
- 7. Land Protection**
- 8. Forest Management**

**9. Land Use Zone Maps, Definitions and Rationale**

**10. Future Work**

## EXECUTIVE SUMMARY

This land use master plan, developed by the Director and staff of the Harvard Forest as the Forest enters its second century, is meant to guide the management and research activities of the Forest into the future. The mission of Harvard Forest remains research and education focused on the ecology and conservation of the New England landscape with special emphasis on the interactions of humans with this landscape.

While focused on the Harvard Forest's ~3200 acre land base in Petersham and Phillipston, this plan was developed in the context of the broader town and regional landscape of land conservation and management, and informed by broader trends in land conversion, use, and major ecological stressors. In particular, we have developed this plan to be compatible with the Petersham Town Master Plan (Petersham Ad-Hoc Planning Committee 2004) and the Wildlands and Woodlands vision (Foster et al. 2005, <http://www.wildlandsandwoodlands.org/>).

This master plan is meant to provide a framework for evaluating and locating future research and education activities, determining appropriate levels and locations of development, management and recreation activities, and guiding land protection efforts into the future.

**Goal:**

The goal of this land use master plan is to allow for flexibility of research and educational uses while protecting current and future research opportunities, and natural and cultural resources.

**Objectives:**

- Formalize an oral tradition of land use at Harvard Forest by developing broad use zones for the Harvard Forest land base (in Petersham/Phillipston, possibly extend to outlying parcels)
- Develop guidelines for acceptable research, educational, recreational, and forest management activities and impacts within these areas
- Use these designations to aid in siting new activities on the Harvard Forest
- Identify appropriate buffer areas to protect
- Lay out a broad framework that will be useful to our neighbors and collaborators

**Summary of the Master Planning Process**

The zoning framework and designation of Harvard Forest parcels in Petersham and Phillipston, MA, was developed from several conversations with the HF lab group over a two-year period. Development of the land use master plan was led by John O'Keefe (Harvard Forest, Museum Coordinator) and Audrey Barker Plotkin (Harvard Forest, Site & Research Coordinator). John and Audrey led discussions involving the Harvard Forest Lab Group, and sought detailed input from David Foster, Harvard Forest's Director. Once a draft was completed, it was sent for review and comments from research collaborators and associates. For more details on the planning process, see Section 9.

Supporting sections document the Harvard Forest's boundaries, history, natural resources, research and educational activities, recreational uses, land protection efforts and forest management activities. Maps and other supporting materials are found in Sections 1-8.

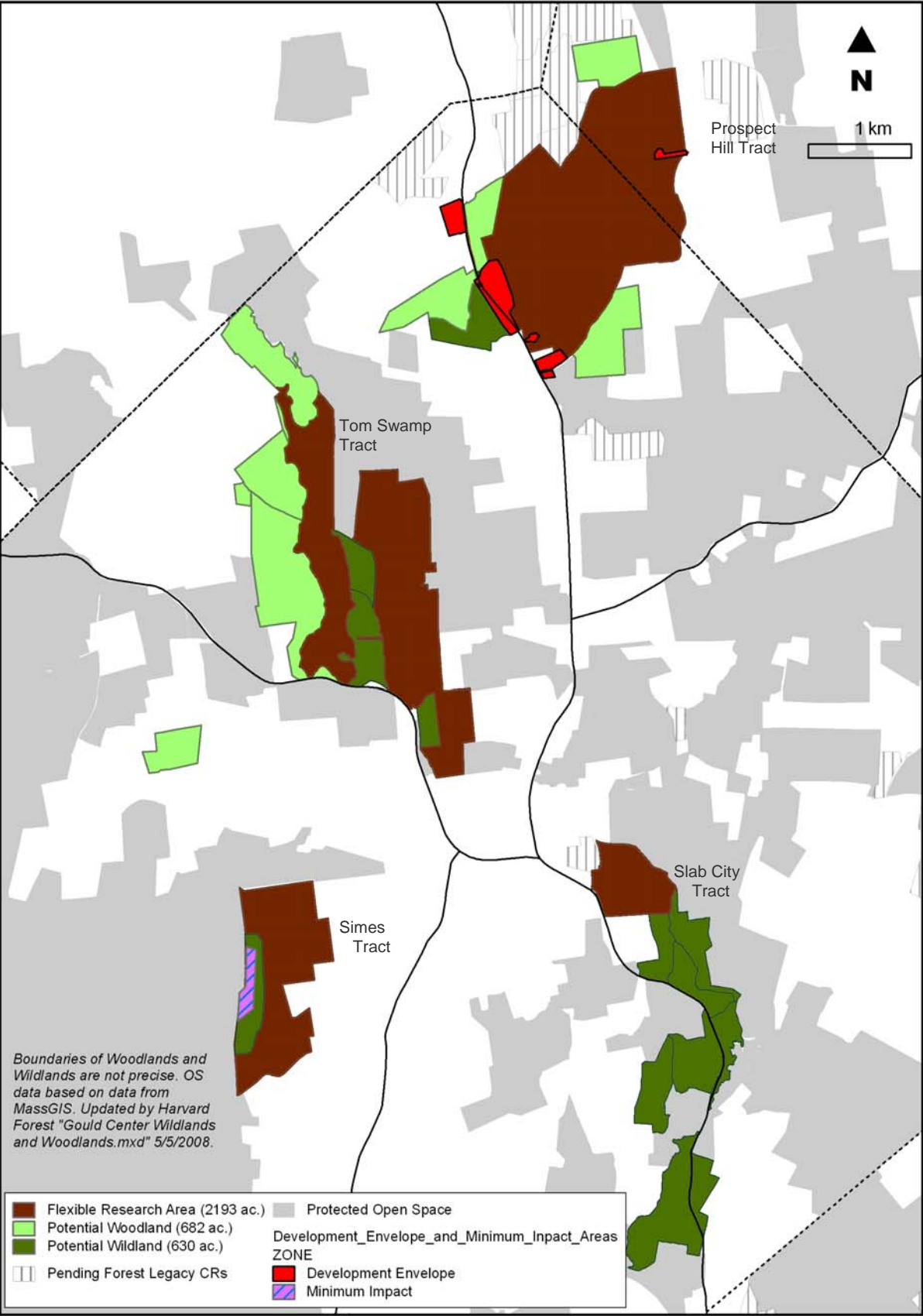
In its first iterations, the zoning process focused on identifying restrictions in use based on site fragility, unique habitat value, and Harvard Forest tradition. In addition, limited areas were suggested as most appropriate for future development of Harvard Forest infrastructure ('development envelope'). In further iterations, the concept of performance standards versus restrictions was discussed and by Spring 2007, the group had moved toward designation of reserves (Wildlands) and active management areas (Woodlands), within a matrix of land available for research and education. Site fragility is not included in the zones, per se, but assessed whenever a research or educational activity is proposed for a particular tract. The Wildlands and Woodlands designations are helpful in targeting long-term use and placement of research activities. An area near the existing building complex is also designated as a 'development envelope' for any future building/infrastructure expansion.

### **The Wildlands and Woodlands Framework**

The Wildlands and Woodlands vision calls for protecting 50% of the forests of Massachusetts and adjoining New England in order to provide multiple values to people, communities and the environment (Foster et al. 2005). Within the expansive area of forest that will be protected as part of this effort, two broad management categories are proposed: **Woodlands**, which would predominate, are actively managed through timber harvesting and other means for diverse products and values including clean water, wood products and other natural resources, carbon sequestration, wildlife habitat, biodiversity, recreation and aesthetics; and **Wildlands**, which would cover perhaps 10% of forest areas, are large forest blocks exempt from direct human manipulation that are allowed to develop and respond dynamically to the prevailing environment and natural disturbance processes, such as wind, ice, pest and pathogen attack and wildlife damage. For more information on the Wildlands and Woodlands framework, see **Section 7** or visit <http://www.wildlandsandwoodlands.org/>.

The overall zoning of the Harvard Forest properties in Petersham and Phillipston, MA are indicated on the **accompanying map**. The zones are explained in the **attached table**. For more details and rationale for the zoning designations, see **Section 9.3**.

**Zone map, May 2008**



Land Use Zones at Harvard Forest.

	<b>Research<sup>2</sup></b>	<b>Education<sup>2</sup></b>	<b>Recreation<sup>2</sup></b>	<b>Forest Management<sup>2</sup></b>	<b>Disturbance Management<sup>2</sup></b>	<b>Sub-Zone</b>
<b>Low Impact / Wildland</b>	<ul style="list-style-type: none"> <li>• Plot markers</li> <li>• Low-impact sampling, with justification and RPA review</li> <li>• Manipulation without lasting impact, with justification and RPA review</li> <li>• No invasive introductions</li> </ul>	<ul style="list-style-type: none"> <li>• Small group visits</li> <li>• Low-impact projects without long-term effects</li> <li>• Interpretive signs along trails</li> </ul>	<ul style="list-style-type: none"> <li>• Sign boundaries</li> <li>• Low-impact hiking, xc skiing, snowshoeing on existing trails and roads</li> <li>• Hunting?</li> <li>• Horses on main woods roads</li> <li>• Collecting with permission only</li> </ul>	<ul style="list-style-type: none"> <li>• Fell hazard trees and maintain existing trails and roads</li> </ul>	<ul style="list-style-type: none"> <li>• Clear existing trails/roads</li> <li>• Precautionary/ abatement measures for invasives</li> <li>• Invasive plant removal</li> <li>• Policies for salvage, fire, beaver &amp; other wildlife?</li> </ul>	<b>Minimum Impact:</b> <ul style="list-style-type: none"> <li>• No visible plot markings</li> <li>• No destructive sampling</li> <li>• Observation from existing trails</li> <li>• Post boundaries</li> <li>• No new trails</li> <li>• No hunting</li> <li>• Minimum maintenance of existing trails</li> </ul>
<b>Research<sup>3</sup></b>	<ul style="list-style-type: none"> <li>• General research (short and long term) as approved from research applications</li> <li>• May include destructive sampling, manipulation, amendments, community disruption as compatible with existing research</li> <li>• Invasive species experiments with permission</li> </ul>	<ul style="list-style-type: none"> <li>• Group visits</li> <li>• Approved research and training projects as compatible with existing research</li> <li>• Interpretive signs</li> </ul>	Recreation as in Wildlands, plus: <ul style="list-style-type: none"> <li>• Mountain biking on roads only</li> <li>• Geocaching with permission only</li> <li>• Hunting, except as posted in research areas</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain roads and trails</li> <li>• Remove hazard trees</li> <li>• Create access and infrastructure if required by approved research and compatible with existing research</li> <li>• Plantation harvest/ other management as compatible with research</li> </ul>	<ul style="list-style-type: none"> <li>• Road maintenance and plowing if needed</li> <li>• Protect infrastructure</li> <li>• Other as compatible or required by research</li> <li>• Precautionary/ abatement measures for invasives</li> <li>• Eradication of all invasive species manipulations at end of experiment</li> <li>• Policies for salvage, fire, beaver &amp; other wildlife?</li> <li>• Invasive plant removal??</li> </ul>	<b>Development Envelope</b> <ul style="list-style-type: none"> <li>• Designated areas for potential expansion of major infrastructure</li> </ul>
<b>Woodland Management<sup>3</sup></b>	<ul style="list-style-type: none"> <li>• Research compatible with forest stewardship plan</li> </ul>	<ul style="list-style-type: none"> <li>• Group visits</li> <li>• Approved research and training projects as compatible with existing management</li> <li>• Interpretive signs &amp; trails</li> </ul>	Recreation as in Wildlands, plus: <ul style="list-style-type: none"> <li>• Mountain biking on trails</li> <li>• Hunting</li> <li>• Post access restrictions during harvests</li> </ul>	<ul style="list-style-type: none"> <li>• Forest management as described in approved Stewardship Plan (including BMPs)</li> </ul>	<ul style="list-style-type: none"> <li>• Existing road maintenance</li> <li>• Skid roads as compatible with management</li> <li>• Precautionary/ abatement measures for invasives</li> <li>• Invasive plant removal</li> <li>• Policies for salvage, fire, beaver &amp; other wildlife?</li> </ul>	

<sup>1</sup>These zones and definitions were developed by John O’Keefe with much input from the HF lab group in December 2005 and March 2006, the invasive species group, and modified by John and Audrey Barker Plotkin in May 2007 to reflect lab discussions in April and May. The definitions and mapped zones will be reviewed and updated at 10-year intervals.

<sup>2</sup>These categories define normal activity; education, recreation and management may be further restricted within a zone if required by current research

<sup>3</sup>Within General Research and Woodland Management zones, care will be taken to minimally disturb archaeological artifacts such as stone walls, cellar holes, etc.

## Preamble

This land use master plan, developed by the Director and staff of the Harvard Forest as the Forest enters its second century, is meant to guide the management and research activities of the Forest into the future. The mission of Harvard Forest remains research and education focused on the ecology and conservation of the New England landscape with special emphasis on the interactions of humans with this landscape. During the second half of its first century the focus of work at Harvard forest shifted from forest management and silviculture toward plant ecology and ecosystem function. This emphasis is anticipated to continue in the new century and further broaden to increasingly focus on many additional aspects of ecosystem science including macro- and micro-fauna, hydrology, invasive species, conservation biology and environmental policy.

While focused on the Harvard Forest's ~3200 acre land base in Petersham and Phillipston, this plan was developed in the context of the broader town and regional landscape of land conservation and management, and informed by broader trends in land conversion, use, and major ecological stressors. In particular, we have developed this plan to be compatible with the Petersham Town Master Plan (Petersham Ad-Hoc Planning Committee 2004) and the Wildlands and Woodlands vision (Foster et al. 2005, <http://www.wildlandsandwoodlands.org/>).

This master plan is meant to provide a framework for evaluating and locating future research and education activities, determining appropriate levels and locations of development, management and recreation activities, and guiding land protection efforts into the future. A primary consideration for all activities must be their compatibility with historical and ongoing research activities. This plan lays the foundation for appropriate use of the land base. Over time unforeseen issues and opportunities will undoubtedly arise and thus require amendments to the overall structure. We suggest reviewing the plan every ten years, or as special circumstances may require.

Several factors have come together to make this an ideal time to develop this master plan. Harvard Forest is in a unique historical position.

1. The current director and staff have had direct connection with previous directors, staff members and supporters, many of whom have now all passed away; therefore, this provides the last direct connection with their deep knowledge of the land. Future land use decisions rest on this historical knowledge.
2. We have compiled an extensive archive of site and regional land-use and research history data and have recently developed management, visualization and analysis tools for these data that allow them to inform our planning process.
3. We are currently conducting and developing research at the landscape scale. Researchers are thinking about and planning research and conservation at this physical and temporal scale.
4. Massachusetts forest cover expanded through the first seven decades of the 20<sup>th</sup> century, but has begun shrinking again since then. However, wildlife populations are still adjusting to the much greater forest cover and reduced hunting/trapping pressure, and are impacting the landscape in novel ways.

5. We are rapidly expanding our field research activities, reviving some timber management activity, and looking toward enhanced LTER and NEON research programs involving significant new infrastructure.
6. We are in a period of rapidly expanding and protecting our land base by acquiring abutting properties with Conservation Restrictions (CR's), assisting abutters to establish CR's on their properties, and considering leveraging these activities by establishing CR's on some of our existing properties.

All these activities and opportunities require careful coordination and planning so they can be successfully accomplished within both the rapidly changing regional landscape context and the complex site research context.

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We chose to use a zoning approach, for the following reasons. First, rather than lay out an active plan for the next 10 years, we wanted a tool to help respond to land use needs at the Harvard Forest. We also wanted a broad, spatially explicit product. Zoning is a familiar tool for local planning. Zoning categories were developed through a series of Harvard Forest Lab Group discussions. Maps of each of the five Harvard Forest tracts in Petersham and Phillipston are zoned, with a description of the criteria used to make each zoning decision.

Use of Harvard Forest lands is primarily for research and educational purposes. In addition, recreation and forest management activities augment or support the primary uses.

**Research** activities range from observational studies to major installations. Much of the research builds on the 100-year record base, and reconstructions of prior land use and vegetation history.

**Education** activities occur at three main levels.

1. Basic, K-12 and other visitors – focused on the Fisher museum and land/trails near the museum.

2. Tours of Harvard Forest that feature visits and discussions at research sites (typically undergraduate, graduate and professional groups).
3. Advanced study for classes and individual projects – more in-depth, focused education that makes use of HF land base in a similar way to research project, with the difference that duration of use tends to be shorter and intensity of impact higher (assuming a larger group than a research team).

**Recreation** includes hiking, horseback riding, hunting, mountain biking, and cross-country skiing.

**Forest management** includes maintaining roads and trails and responding to disturbances such as controlling pests, wildlife or invasive plants, and mitigating or salvaging damage from wind and fire. Designated **Woodlands** provide areas for active management including timber harvesting for wood production, wildlife habitat, and/or recreation/aesthetics.

**Reserves (Wildlands)** provide areas where natural ecological processes are allowed to proceed with little human intervention, buffer very sensitive sites, provide controls to manipulated sites and protect the ecological integrity of nearby research sites.

Using this information and zoning maps to make decisions about siting future activities.

Step 1. Use zoning maps to identify compatible areas for the activity.

Step 2. Use information on the locations of current activities and use restrictions that surround them. This would ideally require developing buffer zones around existing (and new, as developed) projects with listing of any restricted activity within buffers.

### **List of Supporting Sections**

1. Base Maps
- 2 & 3. History and Natural Resource Information that form basis for zoning
- 4 – 8. Land Uses and their policies
  - Research
  - Education
  - Recreation
  - Land Protection
  - Forest Management

The land use zoning map and accompanying rationale follows these sections.