# Antietam National Battlefield

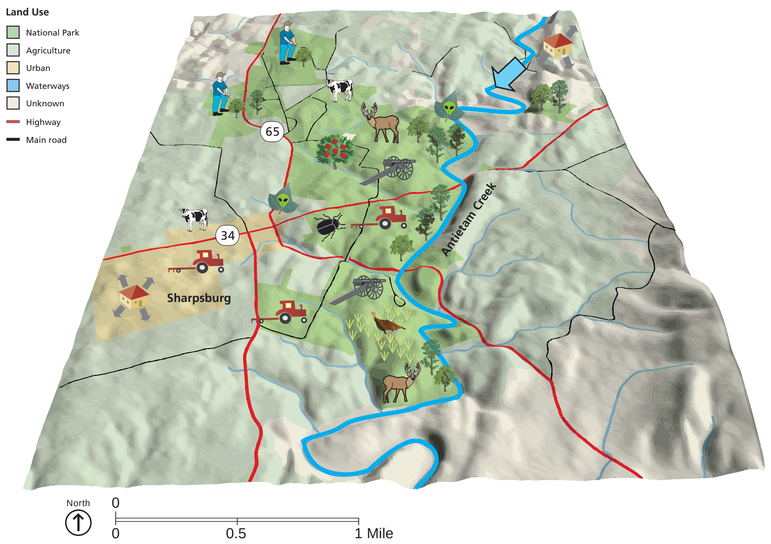
Maryland

National Park Service
U.S. Department of the Interior

National Capital Region Network

## A Diverse Landscape Protects Natural Resources

Antietam National Battlefield is managed within the historical context of General Robert E. Lee's first invasion of the North during the Civil War. The 1,926 acre park is located in the heart of Maryland and is surrounded by rolling hills dotted with farm fields and pastures reminiscent of the day of battle. Patches of forest, open meadow, streams, and cropland are found within the park. It is the park managers' challenge to understand how all these natural elements work together to achieve the desired landscape along with managing for the highest quality of environmental protection.




**Resource Values**

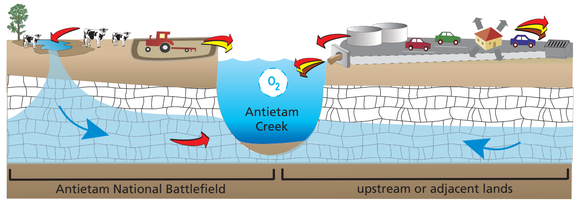
- Freshwater flow: Antietam Creek
- Historic sites: Civil War battlefields
- Forests: hickory and chestnut oak
- Grasslands
- Agriculture: dairy and crop farms, and apple orchards
- Reforestation
- Native wildlife: wild turkey

**Resource Stressors**

- Development: suburban
- White-tailed deer: overpopulation
- Invasive/exotic plants
- Insect pests: wooly hemlock adelgid

## Water Quality and Hydrology

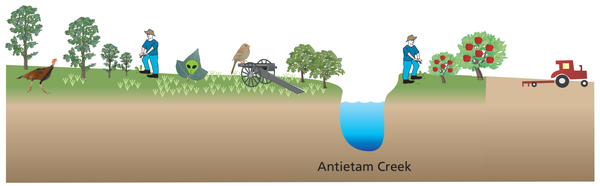
*Upstream and surrounding land uses impact water quality*




Antietam Creek is a major component of the park's landscape, and surface waters within the park are currently of moderately high quality ($O_2$). However, the future quality of the creek and its tributaries are potentially impacted by agricultural inputs (manure and fertilizers, pesticides) from park and adjacent farmlands, upstream industrial and sewage discharge, and the increase of impervious surfaces and storm-water runoff in surrounding residential areas. Groundwater is also easily impacted because the park lies on a porous, limestone bed.

## Ecosystem Pattern and Processes

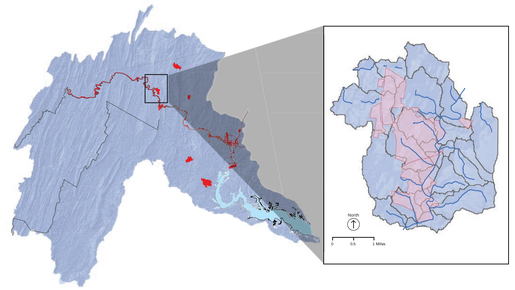
*Park management maintains diverse land uses*



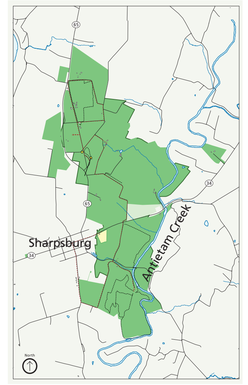

Antietam National Battlefield offers a mixture of farmland, pasture, woodlots, and rich oak/hickory forest. The diverse land use conditions influence exotic species introductions to and native species movements within the park. Land use changes in and surrounding the park will greatly affect these processes. Restoration activities associated with recreating historic land use patterns also influence natural and cultural resources. For example, managed grasslands contribute to regional grassland bird conservation, and historic orchards and woodlots continue to be replanted throughout the park.

Civil War history resides with Antietam National Battlefield landscapes.

## Antietam National Battlefield Watershed



(Above left) Potomac River watershed and National Capital Region Network parks (red). (Above right) Antietam National Battlefield watershed and boundary.




Park map showing major roads and waterways.

## Vital Signs Monitoring

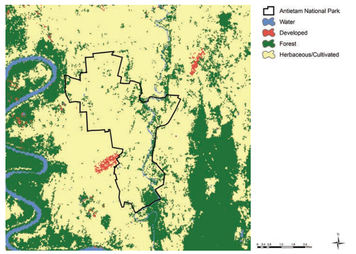
*Assembling the puzzle*

Park vital signs monitoring is designed to inform managers of the condition of water, air, plants and animals, and the various ecological, biological, and physical processes that act on those resources. This site-specific data will provide parks the information needed for ecologically sound management of the natural resources.

In Antietam National Battlefield, data are being collected on **Water Quality and Hydrology** and **Ecosystem Patterns and Processes**, with reference to park specific concerns as well as understanding regional issues.

The table (below left) is known as a transition matrix. It indicates the amount of land that changed land cover types at Antietam National Battlefield from 1992 to 2001 (measured in hectares [ha]). For example, between 1992 and 2001, 314.46 ha changed from grassland/cropland into forest. The map (below right) provides the 2001 classified Landsat™ image of the park and the surrounding environment. New imagery will continue to be acquired and classified every five years. These images will be interpreted to identify the nature of land cover change (direction and magnitude) occurring on the landscape.

| | | 2001 (ha) | | |
|---|---|---|---|---|
| | | Developed | Grassland/ cropland | Forest |
| 1992 (ha) | Developed | 0.00 | 0.09 | 0.18 |
| | Grassland/ cropland | 0.09 | 823.23 | 314.46 |
| | Forest | 0.00 | 33.21 | 124.74 |




National Capital Region Inventory & Monitoring Program
National Park Service
www.nps.gov/cue

Integration & Application Network (IAN)
University of Maryland Center for Environmental Science
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Photos by NPS