



Monocacy National Battlefield Natural Resource Condition Assessment—SUMMARY

National Capital Region



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Jane Thomas, Tim Carruthers, Bill Dennison
Integration & Application Network
University of Maryland Center for Environmental Science
PO Box 775
Cambridge, MD 21613

Mark Lehman, Megan Nortrup, Patrick Campbell
National Capital Region Inventory & Monitoring
National Park Service
4598 MacArthur Blvd NW, Washington, DC 20007

Andrew Banasik
Monocacy National Battlefield
National Park Service
4801 Urbana Pike
Frederick, MD 21704

This document has adapted the Executive Summary of the Natural Resource Condition Assessment report that the University of Maryland Center for Environmental Science produced in collaboration with staff from Monocacy National Battlefield and the National Capital Region Network Inventory & Monitoring Program.

The full 146-page report can be accessed via <https://irma.nps.gov/App/Reference/Profile/2172115> and <http://www.ian.umces.edu/press>.

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ON THE COVER

Gambrill Mill Trail near Bush Creek, Monocacy National Battlefield.
Jane Thomas.

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BACKGROUND AND CONTEXT

Monocacy National Battlefield was created by Congress on June 21, 1934 to commemorate the Battle of Monocacy fought on July 9, 1864. Here, a small Union army successfully delayed a larger Confederate force advancing on Washington, DC. This delay provided Union General Ulysses S. Grant sufficient time to reinforce defenses at the nation's capital and prevent its capture. Because of this, Monocacy came to be known as the 'Battle that Saved Washington, DC.' The six properties that make up the battlefield essentially retain their Civil War-era character. Most park land is used for agriculture, with a small portion left for forest cover of the mixed-oak deciduous variety common to the eastern United States. The park is predominantly bordered by residential and commercial properties and is divided by Interstate 270. Nearby development and increasing road traffic threaten air and water quality as well as the soundscape and historic views within the park.

The park is charged with maintaining the property in historical land use to preserve the view of the battle. Monocacy National Battlefield covers 667 ha (1,647 acres) and is located in Frederick County, Maryland. Visitation to Monocacy has doubled over the past decade, with 15,000 visitors in 1999 increasing to 31,000 visitors in 2008.

In the face of encroaching development and with its diverse landscape including forests, wetlands, waterways, and grasslands, the park represents a sanctuary for many plant and animal species. A wide range of mammals, birds, amphibians, reptiles, and threatened plant species make their home in the park.

The first step in framing this Natural Resource Condition Assessment for Monocacy National Battlefield was to define the key habitats within the park. Habitats 'managed for natural resource values' were the natural habitats (forests, wetlands and waterways, warm-season grasslands) and were assessed for ecological value, while habitats 'managed for agricultural values' (croplands and pastures) were assessed for being the most ecologically sustainable croplands and pastures possible.



The Thomas Farm at Monocacy National Battlefield.

APPROACH

A habitat framework was used to assess natural resource condition within Monocacy National Battlefield. After determining key habitats, potential indicators to inform the current condition of these habitats were identified and data sourced. Reference conditions were determined based on published scientific literature, federal or state guidelines, and historic data as appropriate. Attainment of reference condition was assessed for each metric and summarized by habitat and ultimately for the whole park. Based on these key findings, management recommendations were developed.

Map of major habitat types in Monocacy National Battlefield.



FEATURES OF MONOCACY NATIONAL BATTLEFIELD

Monocacy National Battlefield consists of the rolling hills and river valleys typical of the Piedmont physiographic province. Many of the flatter areas in the park are classified as prime farmland, a designation identifying land that has a favorable combination of physical and chemical characteristics to promote greater production of crops, pasture, or hay.

Agriculture is the most prominent land use within the park boundary and a variety of farming activities take place. There are six properties that make up the battlefield—the Baker, Best, Lewis, Thomas, and Worthington Farms, and the Gambrill Mill Tract. Approximately 33% of Monocacy National Battlefield is forested, with the largest forested areas found along the Monocacy River, on and around Brooks Hill near Hardings Run, along Bush Creek on the Gambrill Farm, and on the Lewis Farm. Most of the wetlands in the park are mostly comprised of freshwater forested/shrub wetland (i.e., floodplain and riparian areas along Monocacy River) and the waterways themselves—Monocacy River, Bush Creek, and Harding’s Run. Managed to maintain historic landscapes and land use patterns that existed at the time of the battle, Monocacy National Battlefield contains approximately 39 ha (96 acres) of managed warm-season grasslands, as well as 70 ha (172 acres) of cool-season grasslands.



The Monocacy River.

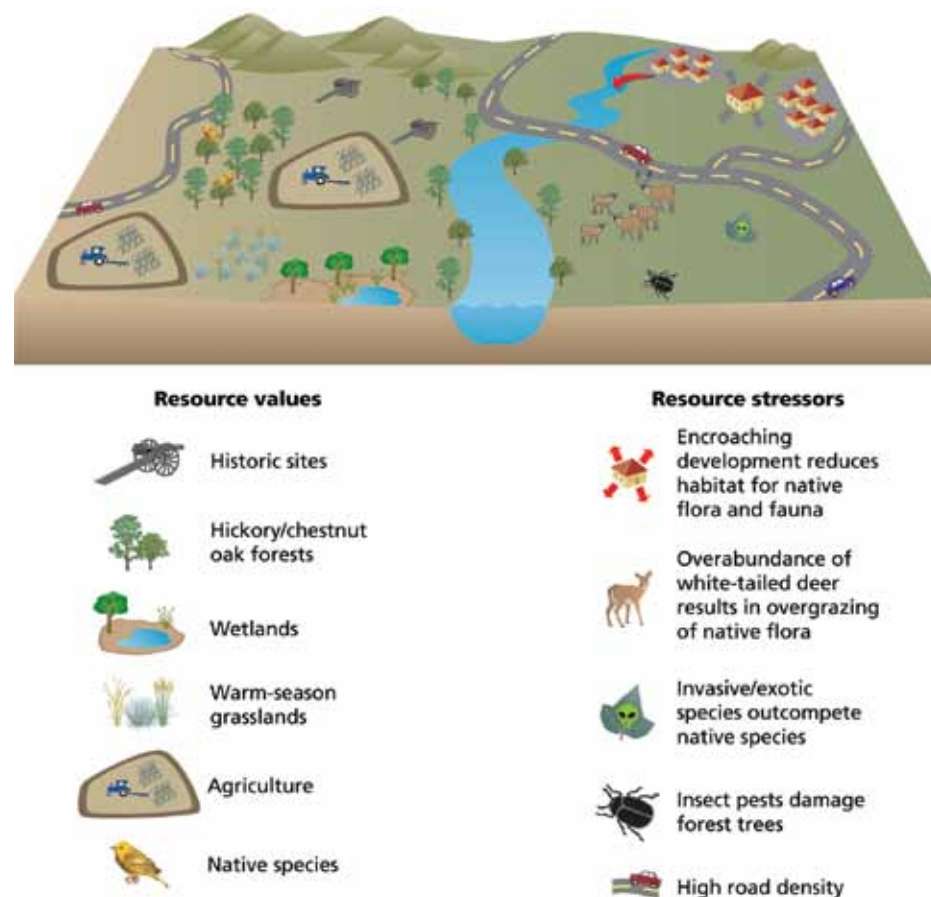
THREATS TO MONOCACY NATIONAL BATTLEFIELD

Monocacy National Battlefield faces a number of resource management issues, many of which are related to the surrounding land use. Encroaching development reduces the habitat available for native flora and fauna. Between 1990 and 2000, population density in the vicinity of the park has continued to increase. Not surprisingly, housing density also increased between 2000 and 2010, with increases occurring in all directions. Road density is also highest in these areas. The area surrounding Monocacy National Battlefield also has a low proportion of protected areas. Protection of 10–60% of suitable habitat is necessary to sustain long-term populations of area-sensitive and rare species. Excessive numbers of white-tailed deer use the park as a refuge, resulting in overgrazing of native flora, particularly tree seedlings. Exotic and invasive plants compete with native species, while insect and other pests cause damage to forest trees. On a regional scale, degraded air quality associated with vehicular traffic also affects aquatic habitats and sensitive species, and continued road development increases stormwater runoff of sediments and pollutants into the rivers.



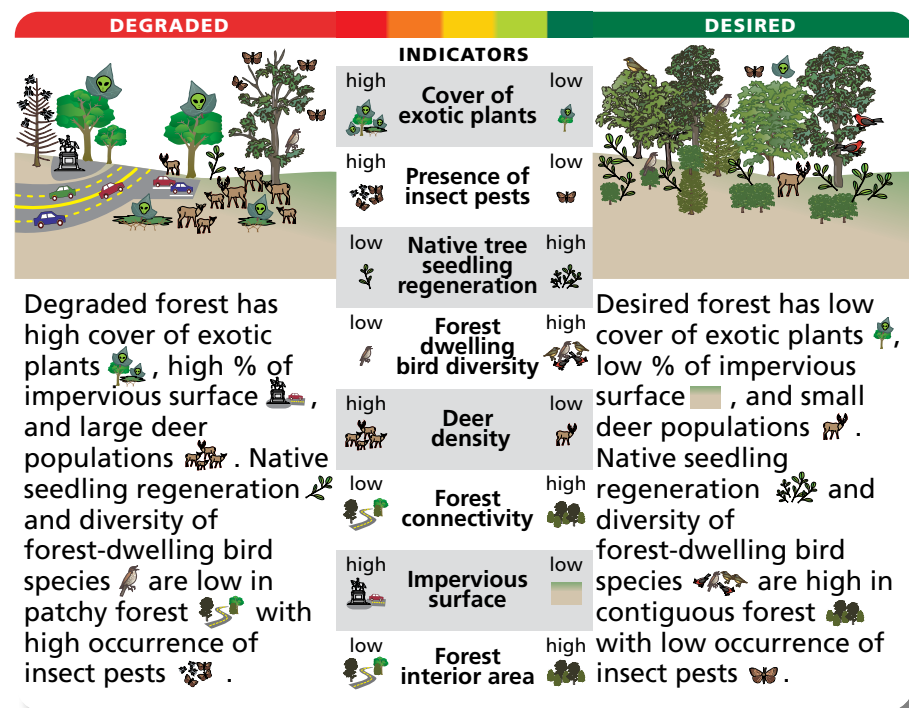
A red fox patrols the edge between cornfield and forest.

Conceptual diagram illustrating the major resource values and stressors in Monocacy National Battlefield.

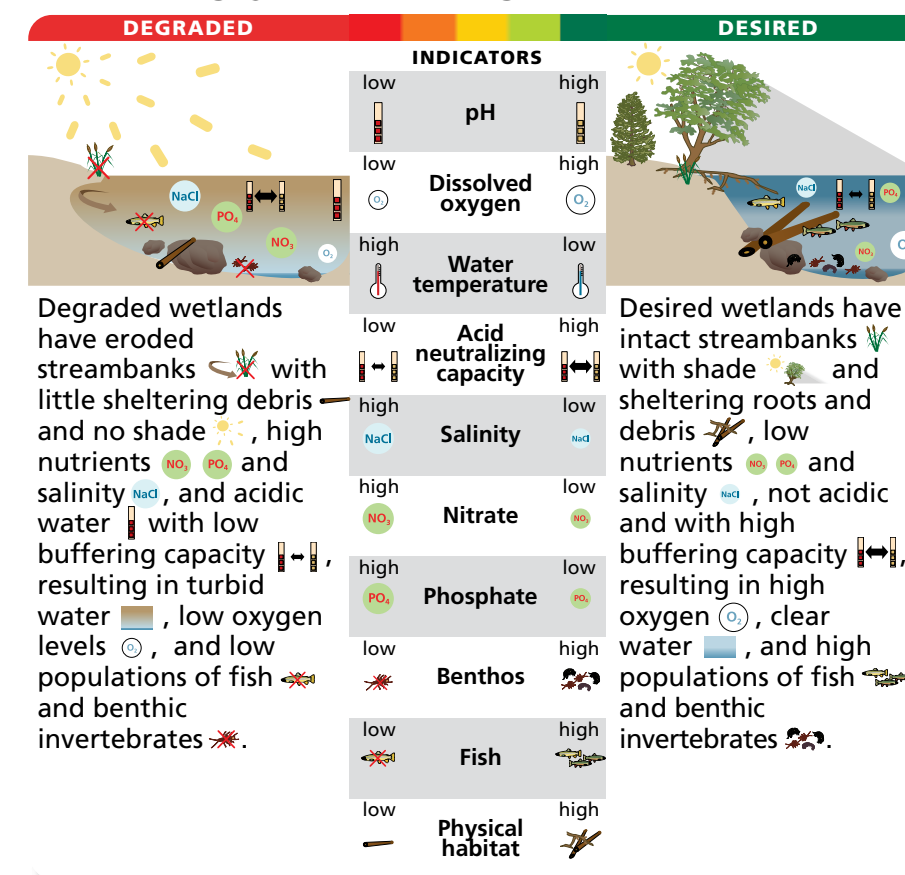


Conceptual framework for desired and degraded condition of the three habitats managed for natural resource values present within Monocacy National Battlefield, indicating metrics to track status of condition (at right and on facing page).

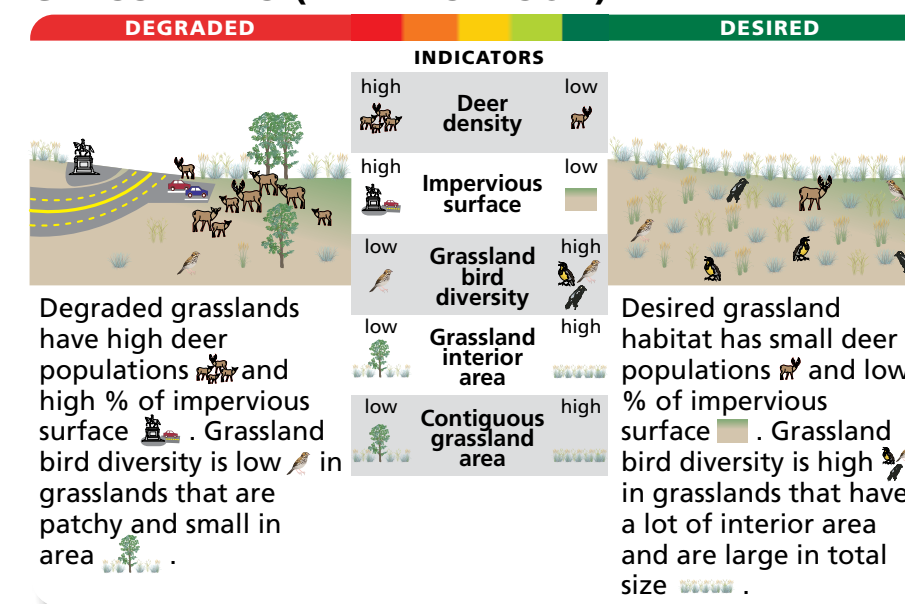
FORESTS



WETLANDS & WATERWAYS

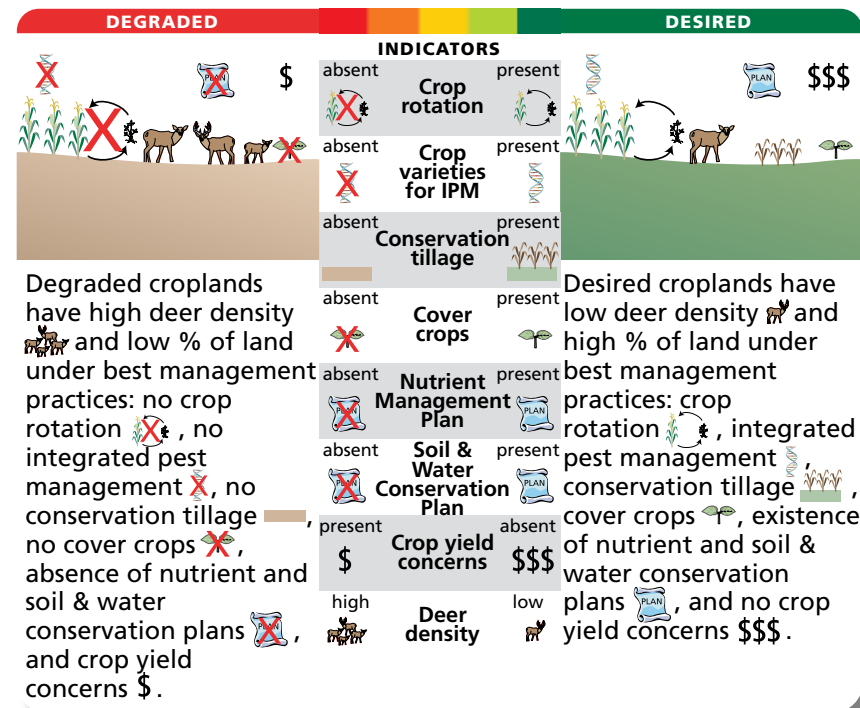


GRASSLANDS (WARM-SEASON)

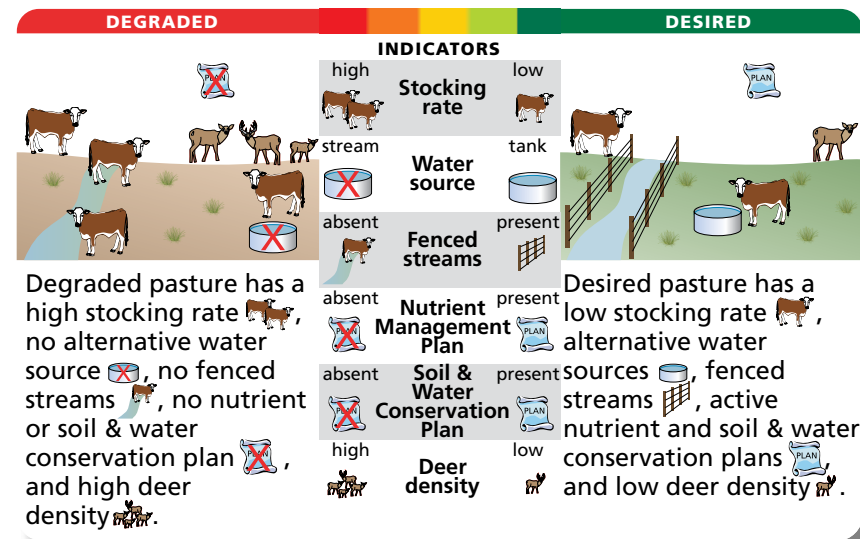


Conceptual framework for desired and degraded condition of habitats managed for agricultural values present within Monocacy National Battlefield, indicating metrics to track status of condition.

CROPLANDS



PASTURES



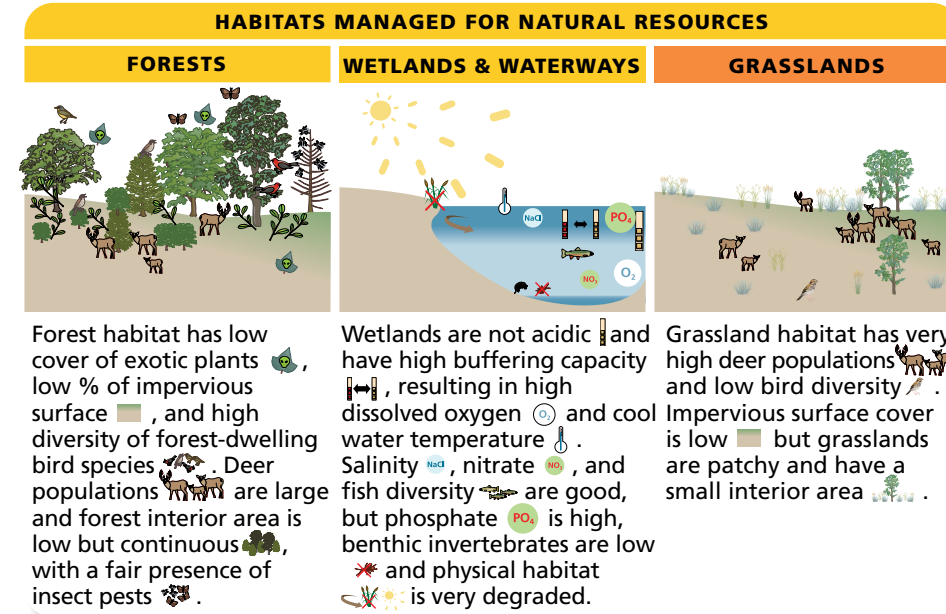
Results of habitat-based condition assessment of Monocacy National Battlefield.

Habitat	Area (ha)	Score (%)	Current condition	Area-weighted score (%)
Forests	141	46	Fair	61 Good
Wetlands and waterways	13	50	Fair	
Warm-season grasslands	39	38	Degraded	
Croplands	253	68	Good	
Pastures	70	81	Very good	

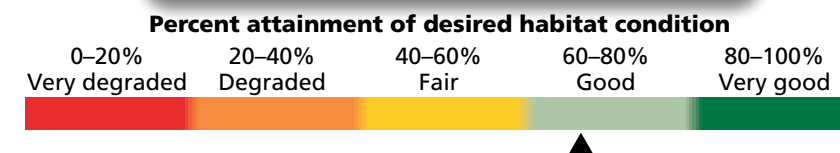
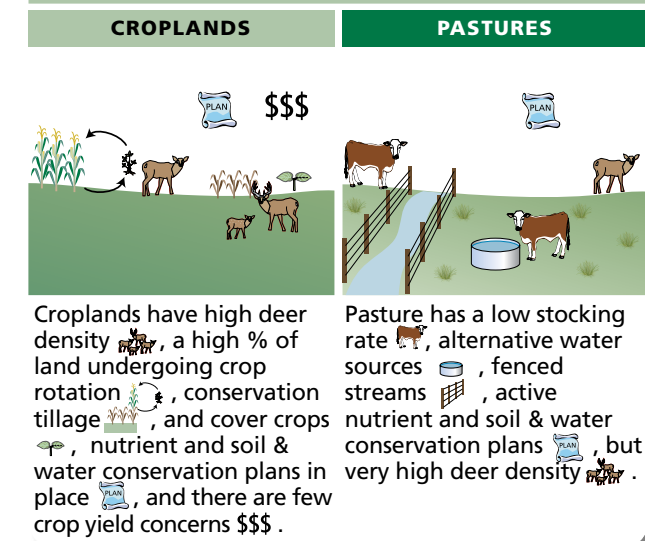
CURRENT CONDITION OF NATURAL RESOURCES IN MONOCACY NATIONAL BATTLEFIELD

Overall, the natural resources of Monocacy National Battlefield were assessed to be in good condition. Habitats managed for agricultural values were in good condition overall, with pasture lands in very good condition and croplands in good condition. Habitats managed for natural resource values were in fair condition overall, with forests and wetlands and waterways in fair condition and grasslands in degraded condition.

HABITAT-BASED NATURAL RESOURCE CONDITION ASSESSMENT OF MONOCACY NATIONAL BATTLEFIELD



HABITATS MANAGED FOR CULTURAL RESOURCES



Forests: Key findings, management implications, and recommended next steps for forest habitat in Monocacy National Battlefield.

Key findings	Management implications	Recommended next steps
Forests		
<ul style="list-style-type: none"> Deer overpopulation reducing forest regeneration capacity 	<ul style="list-style-type: none"> Increased herbivory reducing desired plant and bird species More road collisions 	<ul style="list-style-type: none"> Implement deer population control measures
<ul style="list-style-type: none"> Presence of exotic plants 	<ul style="list-style-type: none"> Displacement of native species, reducing biodiversity 	<ul style="list-style-type: none"> Early detection Exotic control measures (spraying and mechanical) Prioritize control strategies
<ul style="list-style-type: none"> Well-connected forest but with small patch sizes 	<ul style="list-style-type: none"> Acts as a refuge for forest interior dwelling species of birds, amphibians 	<ul style="list-style-type: none"> Minimize stressors Minimize fragmentation (roads, structures, trails) Maintain size, especially of larger patches

Wetlands and waterways: Key findings, management implications, and recommended next steps for wetland and waterway habitat in Monocacy National Battlefield.

Key findings	Management implications	Recommended next steps
Wetlands and waterways		
<ul style="list-style-type: none"> Monocacy River and tributaries have degraded water quality (nitrate, phosphate) 	<ul style="list-style-type: none"> Affects stream flora and fauna Reduces quality of visitor experience 	<ul style="list-style-type: none"> Reduce non-point source nutrient inputs from watershed (partnership with agencies) Continue riparian buffer establishment (woody or herbaceous, depending upon cultural resources/viewshed present)
<ul style="list-style-type: none"> Stream benthos (IBI) very poor 	<ul style="list-style-type: none"> Reduced biodiversity Reduced support of higher trophic levels 	<ul style="list-style-type: none"> Improve water quality
<ul style="list-style-type: none"> Stream physical habitats vary from good to poor 	<ul style="list-style-type: none"> Affects riparian habitat and in-stream fauna (fish) Affects park infrastructure via erosion 	<ul style="list-style-type: none"> Comprehensive assessment of stream Physical Habitat Condition

Warm-season grasslands: Key findings, management implications, and recommended next steps for warm-season grassland habitat in Monocacy National Battlefield.

Key findings	Management implications	Recommended next steps
Grasslands (warm-season)		
<ul style="list-style-type: none"> General lack of comprehensive data for grasslands 	<ul style="list-style-type: none"> Difficulties in assessing the health of grasslands 	<ul style="list-style-type: none"> Implement grassland monitoring, particularly diversity, invasive species, birds, mammals, and insects Carry out a baseline grassland plant inventory
<ul style="list-style-type: none"> Grassland areas are not contiguous and are limited in interior area 	<ul style="list-style-type: none"> Decreases habitat value for avian fauna and mammals (by increasing potential predation) 	<ul style="list-style-type: none"> Remove tree lines where historically appropriate Expand area of native grasses

Croplands: Key findings, management implications, and recommended next steps for cropland habitat in Monocacy National Battlefield.

Key findings	Management implications	Recommended next steps
Croplands		
<ul style="list-style-type: none"> Deer overpopulation 	<ul style="list-style-type: none"> Reduced productivity and viability of cropland 	<ul style="list-style-type: none"> Implement deer population control measures
<ul style="list-style-type: none"> Croplands are in high compliance with best management practice 	<ul style="list-style-type: none"> Suggests that croplands are being managed sustainably 	<ul style="list-style-type: none"> Organize and document compliance monitoring Research new techniques in sustainable agriculture
<ul style="list-style-type: none"> Nutrient management plan is in place but implementation and effectiveness not documented 	<ul style="list-style-type: none"> While compliant with regulations, nutrient impacts on surrounding habitats managed for natural resource values are unknown 	<ul style="list-style-type: none"> Park-wide agricultural best management practice effectiveness survey Monitor and enforce Nutrient Management Plans and required soil testing.

Pastures: Key findings, management implications, and recommended next steps for pasture habitat in Monocacy National Battlefield.

Key findings	Management implications	Recommended next steps
Pastures		
<ul style="list-style-type: none"> Deer overpopulation 	<ul style="list-style-type: none"> Degrading value of pasture, impacting surrounding habitats 	<ul style="list-style-type: none"> Implement deer population control measures
<ul style="list-style-type: none"> Nutrient management plan is in place but implementation and effectiveness not documented 	<ul style="list-style-type: none"> While compliant with regulations, nutrient impacts on surrounding habitats managed for natural resource values are unknown 	<ul style="list-style-type: none"> Park-wide agricultural best management practices effectiveness survey Comprehensive soil nutrient assessment and monitoring

