

# FOREST CONDITION INDEX



Hudson River  
Estuary Program

## Conservation Data for the Hudson River Estuary Watershed

Forests are a critical component of healthy watersheds, and have tremendous ecologic and economic value. They provide habitat for wildlife and plants, protect water and air quality, mitigate the effects of climate change, and provide opportunities for outdoor recreation and the forest products industry. While approximately 65% of the Hudson River estuary watershed is forested, the condition of that forest land is variable, with only about half meeting the criteria of higher-quality, intact core forest.

In 2019, the Hudson River Estuary Program partnered with the New York Natural Heritage Program to assess the condition of forests in the watershed so that conservation, restoration, and management decisions can be informed by the best available data.

### Forest Condition Index Overview

The Forest Condition Index is a spatial data set that:

- Identifies forest patches >100 acres using the most recent land cover data.
- Estimates the condition of each forest patch relative to other patches in the watershed using a variety of region-wide data.

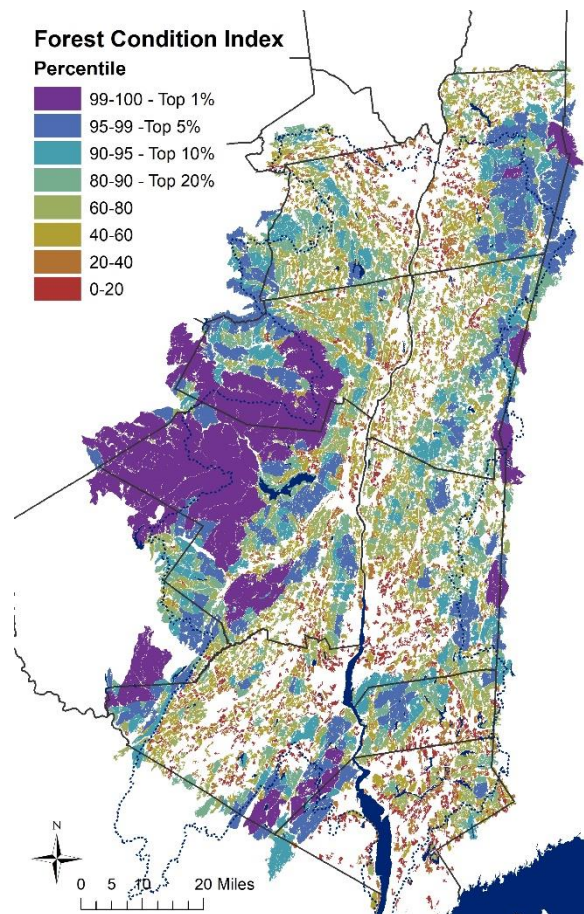
The 2019 index improves upon previous forest patch data for the estuary watershed by considering not only size, but also condition.

### Data and Methods

Forests included in the index were identified using the 2016 National Land Cover Database. All roads and railroads were removed to reveal patches of continuous forest. Forests at least 100 acres in size were then selected to create a **large forest patch** data layer. The forest patches were further analyzed to delineate **core forests**, which are interior forest areas at least 100 meters from a forest edge.

To create the index, large forest patches were assigned points for 22 metrics relating to forest size, fragmentation, habitat connectivity, stressors, habitat and ecosystem values, and carbon sequestration. Points for each forest patch were summed and used to rank the forest patches by percentile. The resulting Forest Condition Index estimates the condition and relative importance of each large forest patch relative to other forests in the estuary watershed.

The complete Forest Condition Index methodology is available in the project report at <https://www.nynhp.org/forest-patches>.



### Measures of Forest Condition:

- **Size**
- **Fragmentation** (e.g. proportion of core forest to overall patch size)
- **Habitat Connectivity** (e.g. proportion of forest cover in the surrounding area)
- **Stressors** (e.g. density of nearby roads)
- **Habitat and Ecosystem Values** (e.g. presence of rare species and significant ecosystems)
- **Carbon Sequestration Value**

## How Can You Use the Data?

The Forest Condition Index can be incorporated into proactive conservation and land-use planning by municipalities, land trusts, watershed alliances, and other groups. Combined with additional data sets and community input, the index can help set conservation goals. The index can also identify opportunities to preserve or restore forests with high landscape connectivity, habitat and ecosystem values, or other notable properties.

### Inventory and prioritization

Include the index in natural resource inventories, open space inventories, and watershed characterizations to understand the location, distribution, and relative condition or importance of forests.

### Plans and policies

The index can inform priority-setting and conservation actions included in comprehensive, open space, and watershed plans; critical environmental area designation; and conservation overlay zoning.

### Site design and land management

Refer to the index during project review or development of stewardship plans and conservation easements to avoid fragmentation or degradation of high-quality forests and core forest areas.

## Where can I find the data?

### Hudson Valley Natural Resource Mapper

Data viewing (see Forest layers)

<https://giservices.dec.ny.gov/gis/hvnm/>

### NYNHP Forest Project Website

GIS data download / report

<https://www.nynhp.org/forest-patches>

## CONTACT INFORMATION

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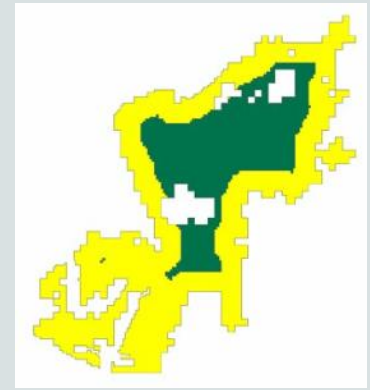
### NYS Department of Environmental Conservation

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<https://dec.ny.gov/nature/waterbodies/oceans-estuaries/hudson-river-estuary-program/conservation-and-land-use-program>  
<https://hudson.dnr.cals.cornell.edu/>

## Impacts of Fragmentation on Core Forest

Forest fragmentation occurs when large forests are divided into smaller patches, often by clearing for new roads or development. These divisions create new forest edges and reduce core forest habitat. Differences in microclimate, predation levels, invasive species, and other disturbance at forest edges produces effects that can extend 100 meters or more into forest patches. The decline of many forest-breeding songbirds in eastern U.S. forests has been linked in part to the loss of core forest habitat.



*Fragmentation analysis delineated core forest (green) and edge forest (yellow) within each large forest patch.*



*The air photo above shows how construction of new roads, driveways, and house lots fragmented a previously large patch of forest.*

## Forest Conservation

Although thousands of acres of forest land in New York are protected by government agencies or conservation organizations, 14 million acres (75% of the state's forested area) are privately owned and generally vulnerable to fragmentation and degradation.

General measures to conserve forest values include:

- Protect large, unfragmented forests.
- Avoid or minimize disturbance to core (interior) forest habitat.
- Preserve broad forest corridors to maintain habitat connectivity.
- Concentrate new development along existing roads or forest edges.
- Allow sound forestry and promote sustainable forest uses.

The Forest Condition Index can inform planning and stewardship to conserve large forests and the numerous benefits they provide.