



Assessing and Monitoring Urban Forested Natural Area Roadmaps



Introduction

The Assessing and Monitoring Roadmap provides guidance on how to assess urban forested natural area condition (e.g. vegetation structure and composition), management needs, and change over time. This roadmap is focused on measuring and evaluating vegetation through field collection, though forest assessment may also be done via remote sensing and include the wildlife and communities that use forests. Assessment and monitoring activities can vary in scale and can be applied to individual sites, whole properties, ecosystems, or the [whole city](#). We recommend assessing and monitoring at multiple scales for both site-level management and context for ecosystem trajectory.



The following are some key considerations for conducting assessment and monitoring in urban forested natural areas. Your process may not occur in the order listed; this is a cyclical process with contextual considerations.

Urban Forested Natural Area Roadmaps

These roadmaps provide guidance for local organizations across the country to protect, restore, maintain, and increase access to millions of acres of urban forested natural areas. Informed by the experience of the [Forests in Cities Network](#), over 40 practitioners from 20 cities around the country contributed to their development.

To access the other roadmaps visit fic.naturalareasnyc.org.

Before the Assessment

Define scale

Begin by determining the study area. For example, a [specific forested natural area](#), a type of [ecosystem](#), a certain jurisdiction, or the [whole city](#). This may be determined by your resources and goals. For example, smaller-scale assessment and monitoring can be used to determine management, while broader scale assessment can be used to determine ecosystem trajectory.

- Ecological assessments are often resource-intensive. Funding often dictates the scope and scale of assessment and monitoring. Establishing a budget will ensure your project is realistic and achievable. Consider the need for ongoing funding for reassessment and monitoring.
- Ecological assessment requires an investment of time and specialized skills. Determining staff capacity, including volunteers and contractors, will help to determine what is feasible for assessment and monitoring. Consider any training that may be required for staff to conduct assessments.

Gather background information

To create a protocol for assessment and monitoring, first determine if there is one already and evaluate the age and quality of existing data. Look at the protocols of other cities, particularly sampling density, which are available on the [resource library](#). Include maps of the sites to be sampled.

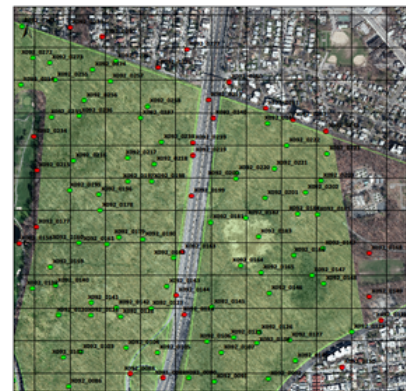
- Define goals and timeframe: Your goals for assessment and monitoring should be clearly defined in advance because your goals will determine the components and methods of your assessment and monitoring. Goals should be specific, measurable, achievable, relevant, and time-bound (SMART). Include how often you plan to reassess (e.g. every 1, 5, or 10 years).
- Including stakeholders when setting goals for monitoring and assessment can ensure that you are collecting data and producing outputs that are of interest to the community. It is also a way to incorporate traditional ecological knowledge or other ways of understanding forested natural areas. See [community engagement and stewardship resources](#) for more information.

Determine metrics and outputs

Metrics should be locally relevant indicators of forest condition, such as the cover, density, or basal area of desired or undesired species. You may also be monitoring for ecosystem pressures or diseases. Lastly, defining outputs (e.g. condition rankings, site-level management recommendations, or public-facing maps) helps ensure data collection and analysis are aligned with the products you intend to deliver. We recommend using a fixed radius plot design for city-wide assessments and quantitative measures of tree species, tree diameter at breast height, ground cover, and measures of forest regeneration at minimum. Qualitative site descriptions can be useful for smaller scale site level recommendations, but can be subjective to the individual.

Design the assessment

The study design should match the scale, goals and outputs of the project. This includes selecting the type of sampling unit, such as circular plots, square plots, or transects, and determining sampling density. For broad-scale assessments intended to describe trends across a large area, a lower plot density can be sufficient. In contrast, site-level assessments meant to inform management actions require a denser sampling strategy with more intensive data collection per unit area. The variability of each metric should be used to determine sample size: highly variable metrics like seedling density require more samples to derive accurate estimates, while lower-variability metrics like basal area often need fewer samples. Where possible, use pilot studies or existing data to determine the number of samples needed to achieve your desired level of confidence.



The Assessment

Collect data

Data collection should follow the established sampling plan and protocols. Field teams should conduct real-time QA/QC checks to catch and correct errors while still in the field, minimizing the risk of data loss or inconsistencies. Managers should work with field staff to ensure protocol adherence and address any issues promptly.

Analyze the data

Once data is collected, they should be analyzed using statistical methods appropriate to the sampling design and study objectives. Analyses should examine and summarize the chosen metrics in ways that align with the intended outputs, whether those are descriptive statistics, condition scores, or trend analyses.

Develop a standardized condition ranking

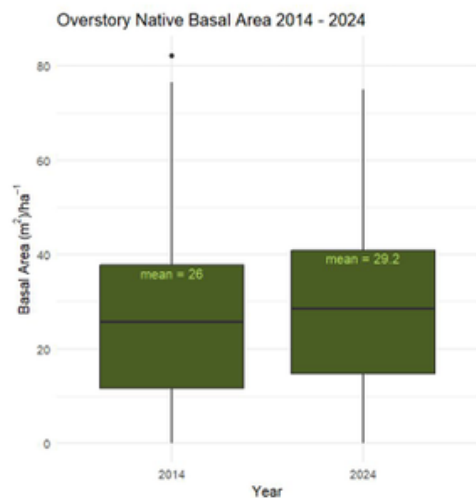
Creating a standardized method for ranking forest condition (your local area may already have this) allows for consistent evaluation across sites and over time. The ranking system should be transparent, repeatable, and supported by clear documentation so that others can understand and replicate the process.



After the Assessment

Produce and share results

The findings of the assessment should be synthesized into clear, accessible outputs and shared with relevant stakeholders, including land managers, policymakers, and the public. Maps, graphs, and infographics can help communicate results in a visually engaging way. Reports should highlight the overall condition of forested natural areas, identify key ecological threats, outline areas of concern, and provide budgetary needs for management.



For more about these figures visit the [NYC Forest Assessment 2.0 Protocol and Materials](#)

Apply findings

The ultimate goal of an assessment is to inform and improve funding and management decisions. The scale at which data was collected will determine how data can be used. For example, low density plots over a large area can tell you about citywide conditions and high-level costs, whereas higher density plots can help prioritize site level management.

Reassess

As determined in your goals, re-measure on a regular basis to ensure that you can monitor change over time. The cadence will depend on the ecosystem, scale, and management needs. Reassessment may become less frequent over time.

Access the Other Roadmaps

- [Management Planning](#)
- [Mapping](#)
- [Ordinances, Laws, and Policies](#)
- [Community Engagement and Stewardship](#)
- [Trails and Public Access](#)