

# CHARTER

## Urban Field Stations in the Northern Research Station (NRS)

Version 1

### Purpose

The purpose of this Charter is to:

- Define an Urban Field Station;
- Describe the vision, roles, and functions of the Urban Field Station Network;
- Establish Urban Field Stations and a Network in the Northern Research Station (NRS);
- Connect with an expanded and inclusive 21<sup>st</sup> century version of the USDA Forest Service's mission – to care for the land and serve the people, *where they live*.

### What is an Urban Field Station?

An Urban Field Station is both a physical place and an extensive network of interdisciplinary scientists and partners working on developing research, curating data, and advancing and delivering science to improve the quality of life and natural resources in urban and urbanizing areas, using an integrated socio-ecological approach. When the Forest Service was established in the early 20<sup>th</sup> century, 80% of the U.S. population lived in rural areas. Currently, in the early 21<sup>st</sup> century, more than 80% of the U.S. population lives in urban areas. Urban Field Stations extend the mission and relevance of the Forest Service, enabling the agency to connect with and serve a larger and more diverse portion of the U.S. population. The Northern Research Station currently maintains Field Stations in Baltimore, Chicago, New York City, and Philadelphia, each of which serves a larger metropolitan area and seeks to extend relevant findings to urban areas more generally. Together, these Urban Field Stations constitute the Northern Research Station's (NRS) Urban Field Station Network.

### Vision of the NRS Urban Field Station Network

The Northern Research Station's (NRS) Urban Field Station Network reflects the USDA Forest Service's commitment to understanding socio-ecological systems across the urban to rural gradient to support and improve comprehensive land management. Or, put more simply, to care for the land and serve the people *where they live*. The mission of the Urban Field Station Network is **to improve the quality of life in urban and urbanizing areas by conducting and supporting short-term and long-term research and science delivery about urban social-ecological systems and natural resource management.**

Urban Field Stations support all Deputy Areas of the Forest Service. Individually and as a network, Urban Field Stations offer place-based opportunities to work with partners in building the sustainable and resilient cities of the future. Ultimately, the NRS Urban Field Stations are important national and international assets, providing a platform for urban ecological research, applications, and programs.

## Roles of the NRS Urban Field Station Network

The NRS Urban Field Station Network specializes in comparative, long-term investments in interdisciplinary research and science delivery. The Network focuses on research that relates to urban environments and delivery that provides results to improve residents' quality of life. With NRS locations currently in Baltimore, Chicago, New York City, and Philadelphia, and increasing interest from other USDA Forest Service Research and Development (R&D) Stations, the Field Station Network fills several roles for Forest Service R&D:

1. To expand existing urban research and educational efforts intended to improve understanding of:
  - a. bio-physiological aspects, such as tree growth and maintenance, tree physiology and morphology, species adaptations, and urban forest ecology;
  - b. social aspects, such as the economic, environmental, social, and human health benefits of trees and forest cover in urban and community environments<sup>1</sup>;
  - c. integrative aspects, such as the role of trees, forests, and other forms of green infrastructure in providing ecosystem services such as clean water, clean air, biodiversity (terrestrial and aquatic), sustainable natural products (fiber, fisheries), and resilience to climate extremes (floods, droughts, storms and heat waves);
  - d. interacting influences of social, biophysical, and governance drivers on:
    - i. management, conservation, and restoration (e.g. tree planting, impervious surface conversion, stream restoration),
    - ii. human health and welfare,
    - iii. environmental program contributions to the "livability" of cities today and the vulnerability of cities to extreme events, both now and in the future.
2. To conduct investigations, experiments, tests, and other activities to obtain, analyze, develop, demonstrate, and disseminate scientific information about protecting, managing, and utilizing natural resources along the urban-rural gradient<sup>2</sup>.
3. To respond to and inform Station and National priorities, needs, and programs.

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<sup>1</sup> Section (9)(b)(8) of the Community Forestry Assistance Act of 1978.

<sup>2</sup> The Forest and Rangeland Renewable Resources Research Act of 1978: SEC. 3. [16 U.S.C. 1642]

4. To engage urban residents as stewards and cooperators in identifying science needs, co-producing information, and applying and evaluating science-based approaches on the ground.

The NRS Urban Field Station Network also plays an important new role in the long arc of Forest Service R&D investments in long term research and science delivery. The Experimental Forest and Range program was initiated in 1908, when the U.S. population was predominantly rural. The population reached an equal proportion of rural and urban residents in the 1920s. The population distribution approached 20% rural and 80% urban by the 1990s. This proportional change continues today and is likely to continue into the foreseeable future.

While there are currently 81 Experimental Forest or Range sites, none are located in urban areas. The only urban long term ecological research (LTER) sites in the U.S., located in Baltimore and Phoenix, were established in 1997 by the National Science Foundation (Figure 1).

The intent of the NRS Urban Field Stations is to address this R&D urban gap in place-based, long-term investments in science and science delivery while enhancing R&D's relevance to the majority of Americans where they live. At the same time, it is expected that the NRS Urban Field Station Network will develop methods, theories, and a greater understanding of social-ecological processes that resonate across the urban to rural gradient.

## Functions of the NRS Urban Field Station Network

**The NRS Urban Field Station Network is multi-disciplinary and interdisciplinary.** The NRS Urban Field Station Network is designed to address pressing questions facing urban and metropolitan regions in the 20-state region of NRS, with application and interactions across the nation and beyond. Questions relating to ecological sustainability, human health and well-being, and recovery from legacies of industry, environmental discrimination, and injustice are complex. Answering them requires multi-disciplinary and interdisciplinary approaches. It is often necessary to combine theories and methods from both ecological and social sciences in order to discern patterns and processes. In some cases, new theories and methods must be developed. Ultimately, urban settings make it essential to assess conservation and management actions from the perspective of linked social-ecological systems (SES).

**The NRS Urban Field Station Network builds and depends on partnerships to conduct relevant research.** Urban Field Stations are physical places to conduct research and deliver science. They are also networks of relationships among scientists, practitioners, and facilities. Core partnerships with non-profit organizations, policy makers, academic institutions, local government agencies, research institutes, educators, and local citizens ensure that the NRS Urban Field Stations can identify critical research needs and provide new information to people who can use it. Urban Field Stations leverage expertise and resources with local partners in order to maximize impact and efficiency. Often, NRS Urban Field Stations are able to forge partnerships with nontraditional new partners, such as working with The Department of Housing and Urban Development, The Rockefeller Foundation, or The Field Museum. Projects may also include

partnerships that stretch across the arts, humanities and sciences (for examples, see [www.ecologicalreflections.com](http://www.ecologicalreflections.com)).

**The NRS Urban Field Station Network facilitates collaborative research.** The Network offers unique opportunities for scientists, artists, practitioners, and educators from a range of different locations, affiliations, and fields to work together. Affiliate scientists, artists, educators, and communication specialists may come from the Forest Service, other government agencies, universities, or NGOs in the US or abroad. Each NRS Urban Field Station has a particular style and setting, supports a range of research interns and fellows throughout the year, and offers significant resources that enable projects to be tended and advanced. At the NRS Urban Field Station locations, often times the Forest Service plays a facilitating role rather than a lead role in advancing efforts and knowledge. Our approach is to best use capacity, capabilities, and interests regardless of organizational status to address relevant pressing issues.

**The NRS Urban Field Station Network focuses on ‘use-inspired’ basic research.** The Network is committed to providing needed information in a timely manner. This requires engaging routinely with practitioners, policy makers, and managers throughout the full research cycle, developing research that meets practical needs while also advancing science. Specific approaches may include synthesizing existing scientific knowledge into a useable form or creating rapid assessment protocols to quickly provide actionable information. Sometimes, Urban Field Station staff serves as conduits of existing science information. Each Urban Field Station develops strategies and capacities for public-facing programs, scientific exchanges, research teams, and data and information delivery systems.

**Urban Field Station research is place-based and widely relevant.** Like the USDA Forest Service’s Experimental Forest and Range network, the NRS Urban Field Stations have a philosophy of addressing local and regional land management problems where they occur. At the same time, the questions asked and answered must be relevant beyond the specific location, advancing the sciences of social and ecological sustainability, adaptation, and resilience. Because NRS Urban Field Stations focus on multi-disciplinary research and work closely with networks of both researchers and practitioners, they are uniquely poised to connect science to decision-makers and to encourage science-based decision-making in urban areas as well as across the urban, suburban, rural continuum.

**The NRS Urban Field Station Network undertakes both short- and long-term studies – and requires both short- and long-term commitments of funding and support.** Urban ecological systems have spatial, hierarchical, and temporal complexity that cannot be understood through short-term studies alone. Short- and long-term research may include experiments, comparisons, modeling, and monitoring. Some studies outlast an individual scientist's career. To support analyses of long-term data and comparisons among sites, the Network emphasizes standardized methods for data collection and information management, including long-term data storage, curation, archiving, access, and discovery. The Baltimore Urban Field Station provides the NRS model; as one of the two urban NSF LTERs, it has long-term, dedicated funding and oversight with which to conduct research while maintaining long-term data archiving principles and approaches.

**The Importance of Urban Field Stations as a Network within the Northern Research Station.** The NRS Urban Field Stations function as a network, learning from the networking experiences and business models of the National Science Foundation's LTERs and the Forest Service's Experimental Forests and Ranges. While this networking approach is a hallmark of research and science delivery by testing generalizability, it also increases science capacity by sharing experiences and lessons learned, and by creating efficiencies and synergies. The Network has demonstrated innovation in developing research, applications, and decision making tools that have been widely applicable and useful beyond the specific locations where we have existing Urban Field Stations. Our intention is that what we learn and apply in one Urban Field Station is applicable and has value for cities across our 20-state footprint and beyond. It is important that consideration be given to how knowledge, lessons, and tools from the Network can be adapted and applied across the entire metropolitan footprint (including suburban, exurban and municipal water supply regions) and across the urban to rural gradient in both national and international contexts, particularly with respect to a social-ecological systems approach. Network coordination is crucial for interacting with leadership at the Station and National levels, for identifying common priorities and projects for research and science delivery, for sharing knowledge and methods, and for adapting and testing theories, approaches, and practices.

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Date