



# Experimental Forests and Ranges and Urban Long-Term Research Areas Foundation

## Forest Service

### Research and Development Mission Area

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#### VISION

Changes in the environment, including climate modification, invasive species, increased wildland fires, and air pollution, pose threats to the well-being of U.S. forests, waters, rangelands, and humans. Understanding these changes requires long-term research about natural resource trends. The Forest Service's system of 80 Experimental Forests and Ranges (EFRs) and planned network of Urban Long-Term Research Areas (ULTRA) will be transformed into an integrated science network for addressing continental-scale environmental change issues in both rural and urban areas for the coming century. Concurrently, EFRs and ULTRAs will continue to provide critical solutions to local and national level natural resource managers and the American public.

#### CAPABILITIES

A century of research on EFRs has produced many benefits for natural resource management and environmental protection. The foundation for a new emphasis on urban ecosystems has been laid in a decade or more of experience as part of the National Science Foundation's Long-Term Ecological Research network in both wildland and urban sites. Scientists from multiple disciplines working across this unique research network have provided:

- Improved management systems that enhance health and productivity of forests, rangelands and urban green areas.
- The scientific basis for urban and wildland watershed management measures that protect the nation's freshwater supplies and indicate ecosystem health.
- Understanding of long-term acid rain and other pollution impacts that guide environmental protection and public health policies.
- Long-term baseline data on climate, streamflow, precipitation, streamwater chemistry, and rural and urban forest vegetation highlight how environmental and land-use change affect ecosystem services.

#### DELIVERABLES

An integrated EFR and ULTRA science network in the Research and Development mission will provide field laboratories to develop:

- Management guides for rural and urban forests, watersheds, and rangelands that reflect changing environmental conditions, societal expectations, and improved knowledge of ecosystem structure, function, and change.
- Resource management and stewardship systems to mitigate effects of a changing environment and societal expectations.
- Early warning of undesirable environmental change through cross system comparisons and ecological conditions based on long-term records.
- Adaptive management and policy models incorporating changes in climate, population, and land-use.

#### BENEFITS

In addition to the above, an emphasized science program for the EFRs and future development of ULTRAs will provide benefits including:

- Improved health of rural and urban forests, waters, and rangelands through capacity to anticipate and mitigate the effects of environmental change.
- Rapid response to changing conditions with increased common understanding of natural resources among public land managers and the publics they serve.
- Enhanced ecosystem services from public lands.
- Increased societal resilience through strong, cadres of interdisciplinary scientists, land managers, and planners prepared to deal with the uncertainty of environmental change.