# PROJECT SUMMARY

The proposed research address a fundamental question: In a complex urban/metropolitan system, what are the convergences and tradeoffs between conserving biodiversity and the provisioning of ecosystem services to people? The research focuses on the Green Infrastructure Vision (GIV) of the Chicago Wilderness alliance, a conservation consortium of over 240 organizations. The GIV, designed to implement the Biodiversity Recovery Plan of Chicago Wilderness, is already influencing long-range land planning in the Chicago region. The GIV identifies 1.5 million acres of recommended resource protection areas – lands that need careful planning and management in order to protect the 360,000 acres of protected lands and waters in the Chicago Wilderness network.

Two postdoctoral researchers will work with the 12-member ULTRA-Ex research team from a diversity of research institutions and governmental agencies to accomplish three specific objectives: (1) Conduct a critical examination of the connections between the biodiversity-recovery goals of the region-wide Green Infrastructure Vision and the delivery of several critical ecosystem services to human communities throughout the Chicago region. Theoretical and empirical findings of already funded, ongoing projects will inform this research, which will examine linkages between social and ecological systems in the context of biodiversity management, green-infrastructure conceptualization and implementation, and the delivery of ecosystem services from the cultural to the biogeochemical. (2) Determine the viable options for, and initiate a pilot "proof-of-concept" version of, a multi-faceted, interactive, web-based Chicago ULTRA-Hub. The proposed ULTRA-Hub will include an interactive platform for managing data, communicating research findings to planners and the public, and collaborating and interacting with scientists and practitioners. It will also be an umbrella and focal point for urban ecosystem research and policy, and will partner with regional education and outreach programs. (3) Under the guidance of the Chicago ULTRA Council and through a series of outreach and education activities (e.g., a metropolitan-wide graduate course, quarterly meetings of area researchers, planners and land managers), develop the integrated theoretical and empirical framework for the full ULTRA proposal.

**Intellectual Merit:** The proposed research will provide scientifically objective information to strengthen planning and conservation practice in the City of Chicago and the larger Chicago Wilderness region (the name "Chicago Wilderness" refers not only to the alliance itself, but also to the spatially complex network of 360,000 acres that are conserved and managed for biodiversity). Needs faced in the Chicago region are faced in urban areas around the world. Chicago Wilderness and the City of Chicago, due to its leadership in improving urban sustainability, have become models for many large metropolitan areas. Thus, the results of the proposed research will be applicable to understanding the dynamics of complex socio-ecological systems of other regions of the US and the world. A novel contribution of the research is the adaptation of the InVEST decision-support tool to investigating the relationship between the protection of biodiversity and the delivery of a range of ecosystem services in a complex metropolitan region. The proposed research will also contribute directly to biodiversity and ecosystem functioning, green- infrastructure planning, asset-based analysis, and resilience theory.

**Broader Impacts:** The proposed research program will strengthen the infrastructure of science by integrating research groups consisting of ecologists, urban planners and social scientists in several universities, a federal agency, and the City of Chicago administration. The proposed project will train two postdoctoral researchers in broadly inter-trans-disciplinary research, and the work accomplished will prepare regional scientists and planners for a full ULTRA application. The proposed research will have a major impact on interdisciplinary education in the social and natural sciences, involving interdisciplinary graduate training programs across the breadth of the City of Chicago and Chicago Wilderness. The project will have impacts well beyond the Chicago region because of connections between the research team and international networks of researchers associated with the Stockholm Resilience Centre; and through other connections with researchers in China, and several countries in South America and Africa.