Project Overview

Green infrastructure is a large-scale initiative for the 21st century. The objective is to transform Lake County communities into sustainable centers by identifying an interconnected system of landscapes to preserve natural habitats, protect biodiversity, and promote healthier lifestyles. Green infrastructure can improve our quality life, while supporting intelligent, balanced economic growth across communities.

In 2015, the Lake County Forest Preserve District selected The Conservation Fund to lead the development of a geographic information system (GIS) based Green Infrastructure Model and Strategy (GIMS) to guide regional and local green infrastructure planning by agencies, organizations, corporations, and citizens of Lake County, Illinois. This strategy was reviewed by an advisory group and supports consistent planning and implementation efforts toward a common vision for conservation in and around Lake County.

This modeling framework will serve as a visual representation and guidance while working toward the District's 100-Year Vision for Lake County, including strategic directions and objectives to:

- Conserve nature at a landscape scale
- Prevent species loss
- Use data for precision conservation
- Eradicate buckthorn
- Improve water quality

Goals

The Lake County GIMS provides a framework for identifying land conservation and restoration opportunities for the county's major landscape types: woodland/forest, prairie/grassland/savanna, wetlands, and freshwater aquatic systems.

This GIS-based model provides information to make data-driven decisions about five special projects, including an assessment of:

- Potential large-scale woodland, wetland, and prairie habitat opportunity areas
- 10,000-acre ecological complexes in and around Lake County
- Water resource capabilities and groundwater recharge areas
- Lake Michigan ravine and lake plain opportunities
- Ecosystem services valuation in Lake County

The District and the advisory group selected three ways to illustrate the boundaries of resources within the study area, based on GIMS data, landscape processes, watersheds, and the desire to provide habitat for Lake County's native species to ensure that no species are lost and that populations of plants and animals can expand and increase. (*See map on page 4.*)

Strategic Habitat Conservation Areas

As defined by the United States Fish and Wildlife Service, Strategic Habitat Conservation Areas (SHCA) are large, landscape scale conservation areas to address challenges, such as habitat fragmentation, disease, and climate variability, which span jurisdictional boundaries.

Addressing these challenges requires planning at an ecologically appropriate scale, such as watersheds and ecological regions, rather than at small scales, such as single land management units.

The District, advisory committee, and other collaborators identified seven potential SHCA:

- Chain O'Lakes
- Fox River Hill and Fen
- Lake Michigan North
- Lake Michigan South
- Lake-McHenry Wetlands
- North Central
- Des Plaines River

Ecological Complexes

A working objective of the GIMS is to identify 10,000-acre ecological complexes within and around Lake County, Illinois. An ecological complex is a collection of core preserves (2,000–5,000 acres) within an SHCA that provides habitat and migration corridors for plant and animal species, so that they may survive and reproduce. These complexes have been identified as priority areas on which the District and other local agencies should be implementing conservation where it will have the most measurable effect.

Using data derived for the GIMS, four ecological complexes have been identified:

- Des Plaines River
- Lake-McHenry Wetland
- Lake Michigan Lake Plain
- North Central

Enhancement Areas

These are areas of the study that provide protection and habitat for species and communities, but current land uses limit further expansion or acquisition. These enhancement areas contain important ecological resources that should be protected and enhanced through community conservation.

Using data derived for the GIMS, four enhancement areas have been identified:

- Central
- Glacial Lakes
- South Central
- West Fork

Ecological Services

Ecosystem services are the collective benefits from an array of resources and processes that are supplied by nature. Forests, wetlands, prairies, water bodies, and other natural ecosystems support human existence. Only recently has it become possible to quantify and reliably estimate the contributions that green infrastructure makes to human well-being and to measure the benefits that nature provides.

Executive Summary

Green Infrastructure Model and Strategy

An evaluation and economic estimate was completed for the following ecosystem services:

- *Carbon Storage, Estimated Annual Value of $4.1 million/year*—Sequesters carbon in vegetation and soils, thereby reducing atmospheric CO_2 and global climate change
- *Groundwater Recharge, Estimated Annual Value of $344 million/year*—Maintains natural rates of groundwater recharge and aquifer replenishment
- *Native Flora and Fauna*, *Priceless*—Protects species diversity and maintains ecosystem functions
- *Recreation and Ecotourism, Estimated Annual Value of $1.29 billion/year*—Increases human health through outdoor, nature-based experiences
- *Water Flow Regulation/Flood Control, Estimated Annual Value of $1.85 billion/year*—Maintains water flow stability and protects areas against flooding
- *Water Purification, Estimated Annual Value of $210 million/year*—Maintains water quality for human consumption, recreation, and aquatic life
- *Air Purification, No Documented Estimate*—Removes particulates and other pollutants from the air

This GIMS helps identify important landscapes in the region that should be preserved to:

- Foster environmental benefits, including clean air, freshwater, vibrant wildlife, and food sources.
- Conserve places that provide a high quality of life and preserve cultural values.
- Connect people with nature.
- Avoid hazard areas by using natural landscapes as buffers against storms, floods, or drought.
- Allow space for natural environments to adapt to climate variability.

Partnership Involvement

The Lake County GIMS represents several regional conservation plans and supports the following vision established and approved by the Lake County Land Preservation Partners: "To release a Lake County landscape where, by the year 2030, at least 20 percent of the county is preserved forever as natural areas, parks, trails, farmland and scenic views."

Additionally, the Lake County GIMS builds on the previous efforts of the Chicago Wilderness regional Green Infrastructure Vision, building a more refined model with higher resolution and up-to-date GIS data. The GIMS also builds on the efforts of The Conservation Fund's support to the Chicago Metropolitan Agency for Planning to assess ecosystem service valuation in Lake and six other Illinois counties.

This strategy involves the District providing the GIMS to local groups and other entities to aid community conservation efforts, including buffers to natural areas, green infrastructure to encourage infiltration of surface water, improving water quality, and expanding natural plant communities into buffer areas, homesteads, and stormwater management areas.

Executive Summary

Green Infrastructure Model and Strategy