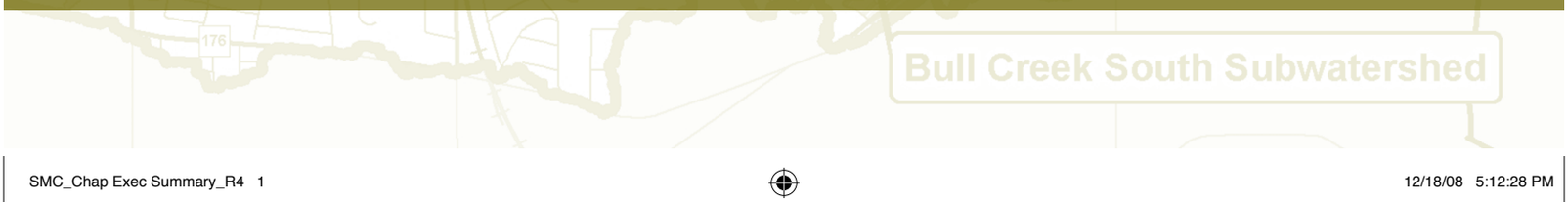
# Bull Creek–Bull's Brook Watershed-Based Plan

## A Strategy for Protecting and Restoring the Watershed

**Executive Summary** August 2008



# Why this Watershed Plan?

Water is elemental to our lives. Our bodies are largely composed of water—and we need to consume clean water for our survival. Plants and animals also need water—and we in turn depend on these plants and animals for food, medicines, fuel and the everyday products we use. Although elemental to our individual lives, our communities and our planet, we sometimes take water for granted.

This plan is important to you because it specifically addresses water problems (and promises) here in your community within the Bull Creek-Bull's Brook watershed. Because clean and abundant water, healthy lakes and streams, and safety from flooding are important for residents and businesses—and generally the economic and environmental health of our community—it is also important to community leaders.

**As a resident, landowner, business or community official your actions make a difference in keeping water in our creeks and lakes clean, reducing flooding, and protecting natural areas that help do both as well as providing habitat and places for people to recreate.**

How water flows and collects in streams, wetlands and lakes is based on landform. Because water flow generally does not follow political jurisdiction boundaries, we recognize that most water resource problems need to be addressed at the watershed level, which frequently involves several political jurisdictions. The watershed planning process for Bull Creek & and Bull's Brook brought the municipalities, townships, county and the broader community of homeowner associations, businesses, institutions, non-profit organizations and residents that live or work in the watershed together to plan for managing and improving the land, lakes, streams and wetlands of the watershed.

*Clockwise from top: Bull Creek South, Libertyville; Aldo Leopold Lake, Prairie Crossing, Grayslake; St. Mary's Lake, Mundelein*

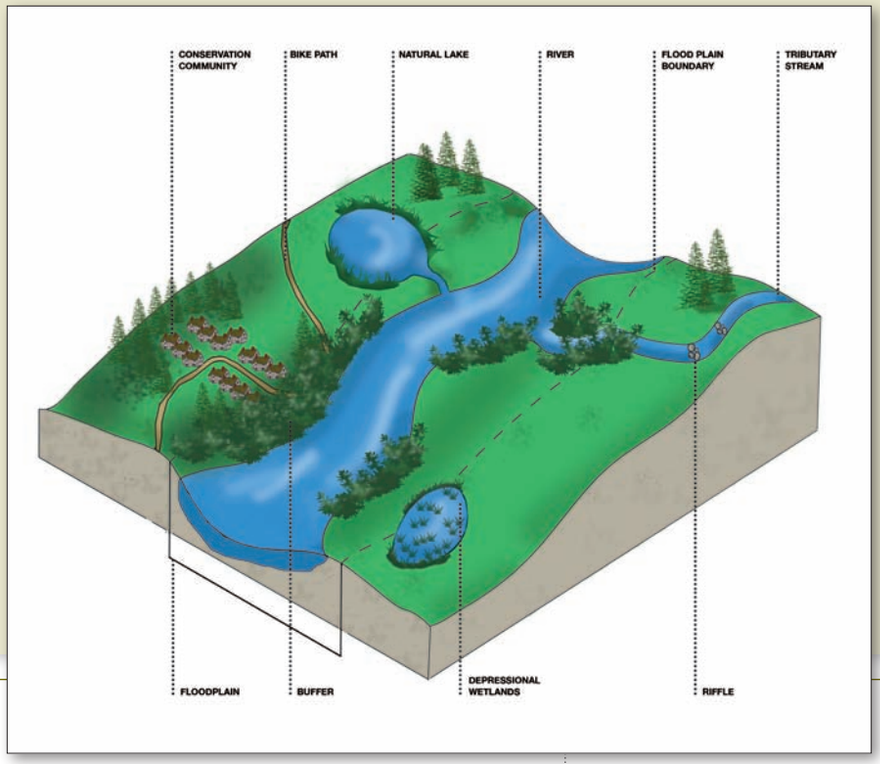
As a resident, landowner, business or community official, your actions make a difference in keeping water in our creeks and lakes clean, reducing flooding, and protecting natural areas that help do both as well as providing habitat and places for people to recreate. The Bull Creek/Bull's Brook Watershed Plan was created to help stakeholders better understand the watershed and to identify what actions need to be taken to prevent and reduce flood damage, improve water quality, and protect and enhance natural resources, greenways, and recreational opportunities. This comprehensive management plan summarizes the overall condition of the watershed (present day and into the future) and recommends actions as best practices that you as a stakeholder, individually or in collaboration with others, can take to protect watershed resources that are still in good shape—and restore those that are degraded.

# What is a Watershed?

After a rain drop or snowflake falls on the land, it may infiltrate into the soil or it may run off over the land surface to a low spot in the landscape, which is usually a body of water (lake, stream or river). A watershed is the area of land that drains to a particular stream, river or lake.

**The health of a waterbody is a direct reflection of how the land in the watershed is used and managed. Some of the benefits of a healthy watershed are:**

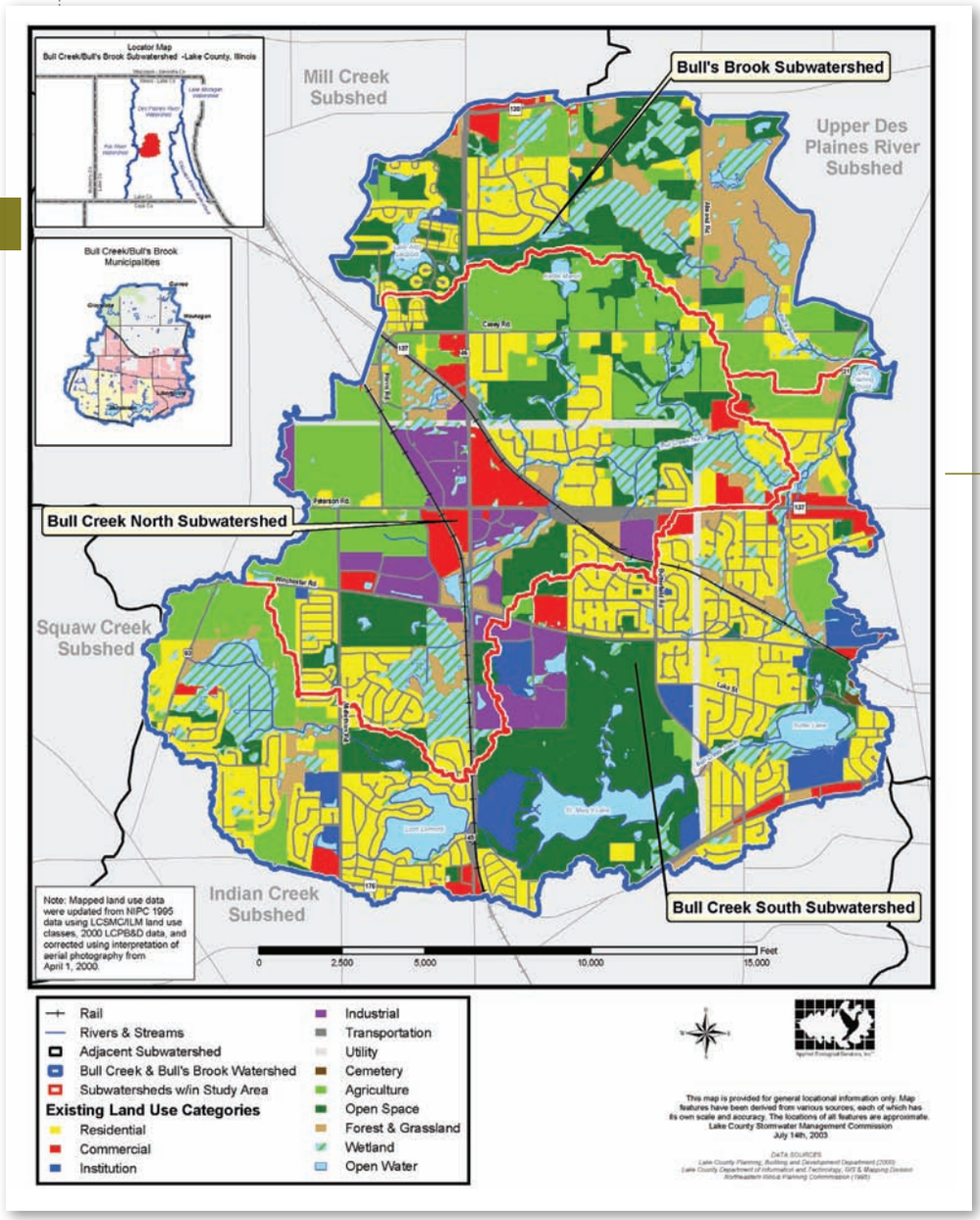
- **improved water quality**
- **fewer flooding problems**
- **enhanced wildlife habitat**
- **provides opportunities for education and recreation**



## Do you live or work in Bull Creek-Bull's Brook Watershed?

Bull Creek-Bull's Brook Watershed, located in central Lake County, is part of the Des Plaines River Basin in northeastern Illinois. Three subwatersheds comprise the larger Bull Creek-Bull's Brook watershed and together they drain approximately 14 square miles to three tributaries: Bull's Brook; Bull Creek North; and Bull Creek South. In addition to the stream system, the natural landscape of the watershed is a complex of lakes, wetlands and upland prairies, savannas and woodlands. Interspersed with these natural features are farms, subdivisions of homes, commercial/industrial centers, area schools, St. Mary's University, and recreation facilities (golf courses, soccer and ball fields, playgrounds etc.). The Villages of Libertyville, Mundelein and Grayslake are the predominate watershed jurisdictions along with unincorporated areas of Libertyville and Warren Townships. Approximately 43% of the watershed is in developed land uses.

*2004 Land Use Data*



## What is special about the Bull Creek-Bull's Brook Watershed?

The landscape we see today was created over 10,000 years ago by the last retreat of the Wisconsin Glacier. As the giant ice sheets melted and retreated, they carved out and left behind unique glacial features such as the moraines, ridges, kettle holes (Butler Lake), and the outwash till plains still visible throughout the watershed, but especially in the northern half that is less-developed.

Remnants, some large and some small, of the pre-settlement landscape and plant and animal communities of the watershed remain today. They are the biodiversity of the watershed. These water and natural resources, along with several significant cultural resources are worth protection and restoration. A short list includes:

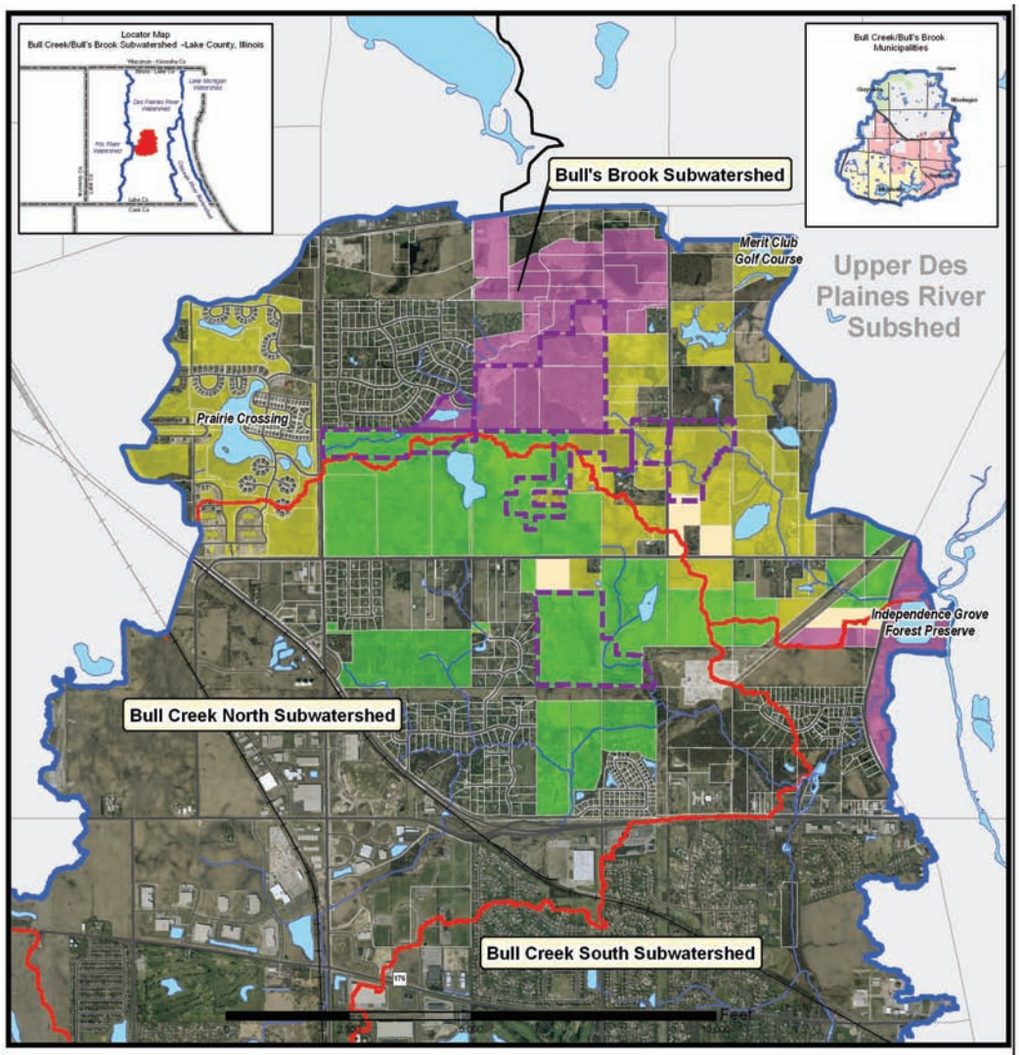
- The South Branch of Bull Creek has a series of lakes: Loch Lomond, St. Mary's and Butler Lakes that are significant features of the communities they are in and the watershed as a whole. St. Mary's University also has one of the largest woodland plant communities in the watershed and central Lake County.
- The North Branch of Bull Creek includes Liberty Prairie, a dedicated nature preserve and one of the remaining few remnant prairies in the state, and extensive high quality wetlands along the creek.
- Bull's Brook includes Sanctuary Pond (a nursery for endangered fish), Leopold Lake, Oak Openings Nature Preserve, and Almond Marsh, which is also a dedicated nature preserve and is home to a number of threatened and endangered species and a significant heron rookery.

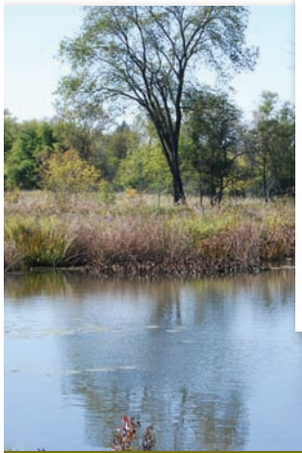
## Watershed Goals

- **Protect and restore natural resources**
- **Improve water quality**
- **Reduce flood damage**
- **Enhance and restore stream health**
- **Guide new development to benefit watershed goals**
- **Preserve green infrastructure**
- **Enhance education and stewardship**
- **Improve watershed coordination and collaboration**

*Left: Almond Marsh;*
*Right: Bull's Brook at Oak Openings Nature Preserve*

Unique to the Bull Creek-Bull's Brook watershed is the Liberty Prairie Reserve. The Reserve is a 5,800 acre area in central Lake County, of which 3,200 acres of public and private farmland and natural areas are permanently protected from further development.



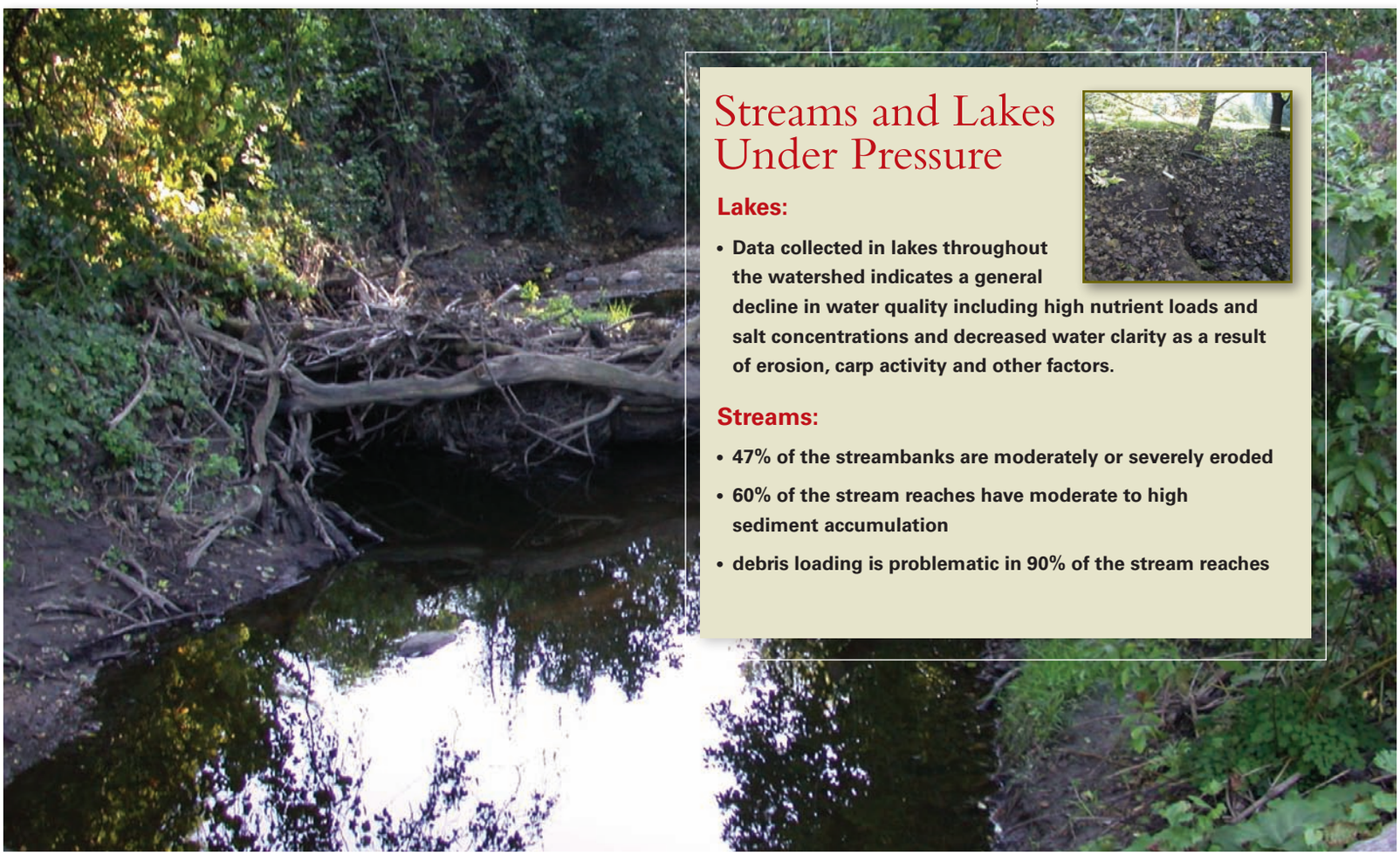
*Legally protected private open lands within the Liberty Prairie Reserve*

## What are the current challenges to watershed health?

Lakes and ponds in the watershed are impaired or becoming impaired by high loads of nutrients in stormwater runoff and high salt concentrations from winter de-icing. Streams are degraded by pollutants in stormwater runoff, erosion caused by the higher volume of runoff to creeks from impervious surfaces such as building rooftops, roads, parking lots etc., and as a consequence of poor riparian or streamside property management and lack of stream maintenance.

### More specifically watershed threats include:

- **Erosion, excess nutrients, and road salt are the biggest threats to water quality**
- **Natural resources are threatened by adjacent and upstream development**
- **Stream channels are degrading due to lack of maintenance**
- **Lakes and streams are threatened by greater volumes of stormwater runoff and pollution**
- **Poor development practices negatively impact water and other natural resources**
- **Automobile "habitat" creates disproportionately more runoff and pollution**
- **Watershed stakeholders lack the knowledge, skills and resources that they need to address watershed issues**
- **Lack of communication, coordination and collaboration among watershed stakeholders to maintain/improve watershed health**



## Streams and Lakes Under Pressure



### Lakes:

- **Data collected in lakes throughout the watershed indicates a general decline in water quality including high nutrient loads and salt concentrations and decreased water clarity as a result of erosion, carp activity and other factors.**

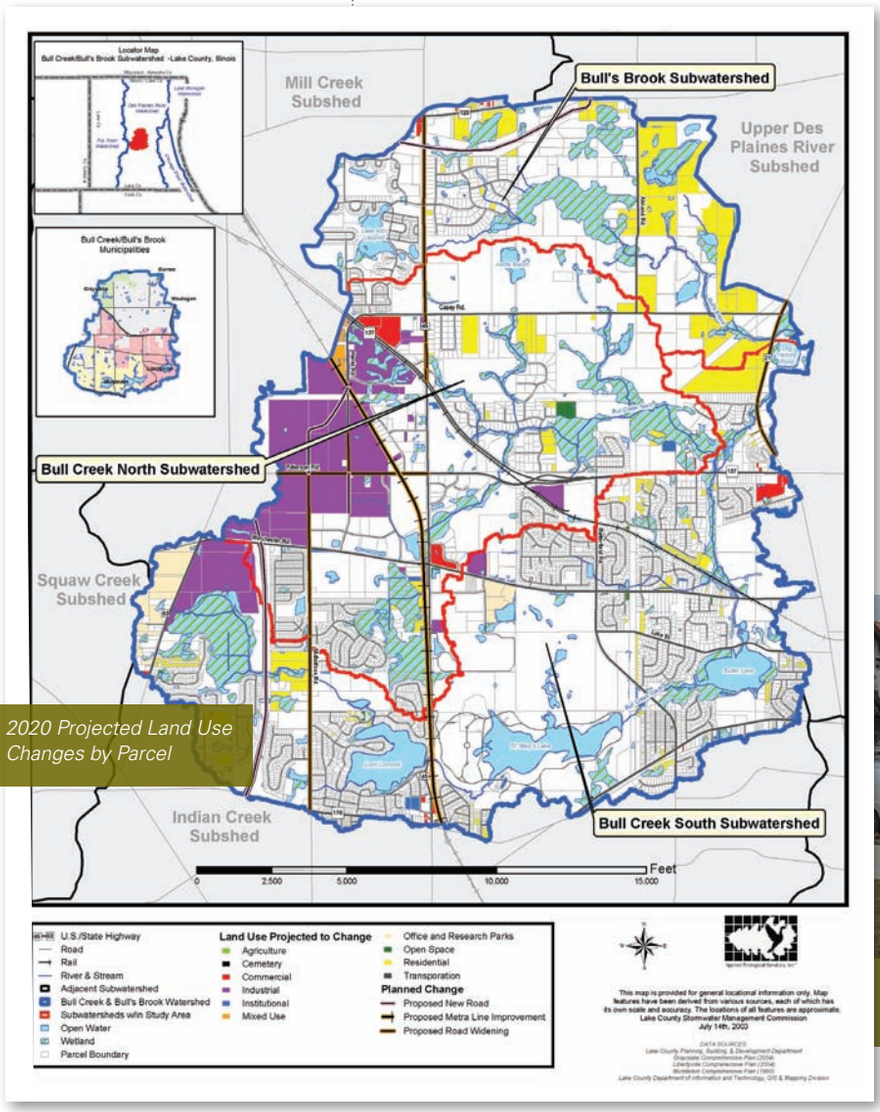
### Streams:

- **47% of the streambanks are moderately or severely eroded**
- **60% of the stream reaches have moderate to high sediment accumulation**
- **debris loading is problematic in 90% of the stream reaches**

# The Future of the Watershed: What is at Risk?

## Impervious Cover Impacts Water Resources

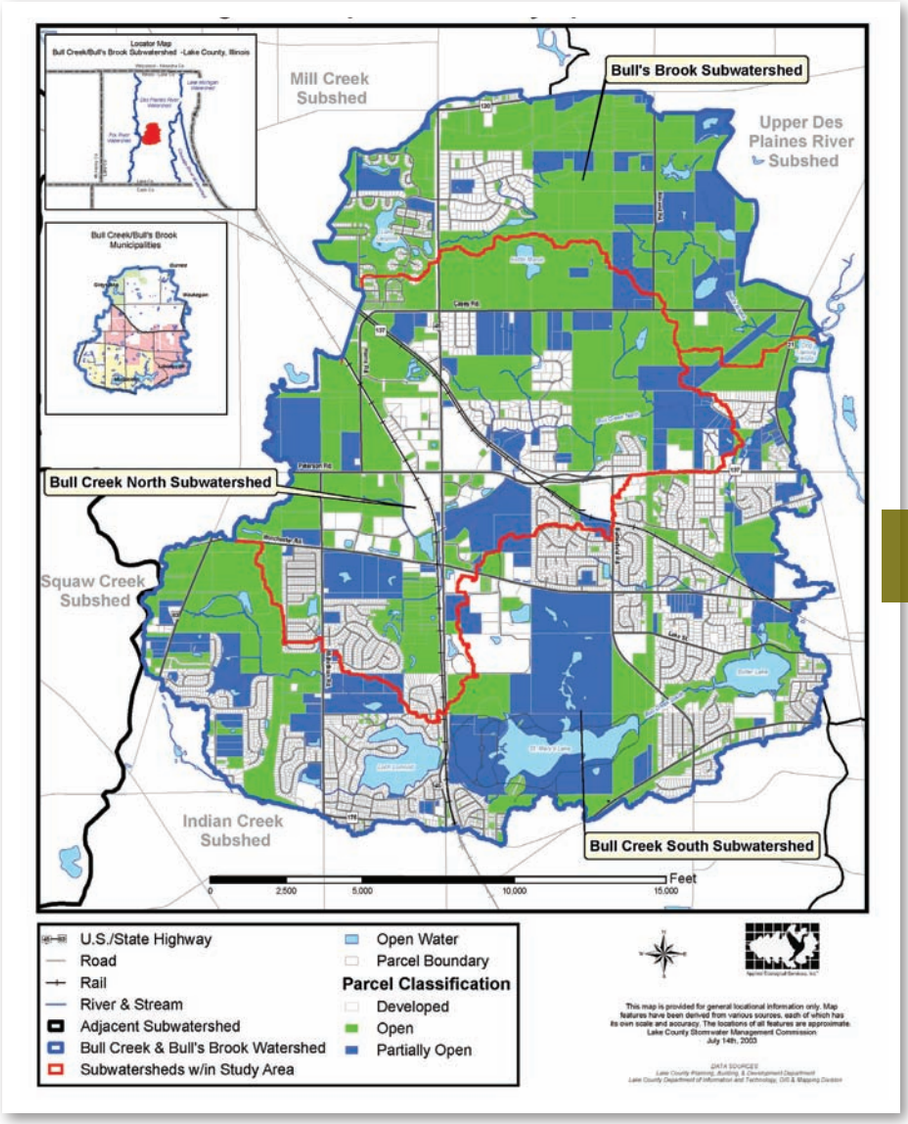
An analysis of the watershed's vulnerability based on the effect of impervious cover on stream and lake quality and flooding was evaluated using the proposed future development in the Bull Creek-Bull's Brook Watershed. Increased impervious cover typically results in more stormwater runoff, which carries pollutants to streams and lakes and causes erosion. Increased volumes of runoff also translate into more frequent flooding and a larger floodplain in some locations. More than 50 homes, businesses and schools are within the mapped 100 year floodplain in the watershed. All of these, and potentially other structures currently outside the floodplain boundary, may be at risk of flood damage in a 100-year flood event. (There is a 26% chance of a 100-year flood damaging your home within the timeframe of a 30-year home mortgage.)




*2020 Projected Land Use Changes by Parcel*

Looking into the future—the number of households in the watershed is expected to increase by 22% and the number of jobs by 90% between 2000 and 2030. Consequently, impervious cover is expected to increase in the watershed as land continues to be developed for these new homes, businesses and their accompanying transportation and parking needs. To reduce the negative impacts on the environment, the watershed plan recommends converting development practices from the

*Traditional residential development in Libertyville.*




*Green Infrastructure*
*Open and Partially Open Parcels*

traditional stormwater collection and conveyance systems to low impact development practices that reduce and infiltrate stormwater runoff.

## Loss of Green Infrastructure

Green infrastructure serves an important function in the Bull Creek-Bull's Brook Watershed. It not only forms an interconnected network of natural areas that absorb and infiltrate precipitation, but also includes the wetlands and streams that make up the natural drainage system of the watershed and the green roofs, detention basins and swales of the built stormwater infrastructure.

A parcel level inventory of the watershed's green infrastructure was conducted, and a total of 5,789 acres of open or partially open land was identified. Future land use projections predict that approximately 1,200 acres of this land will be developed over the next 20-30 years (roughly 21%). The hydrology functions that this open land currently provides to the watershed (absorbing, infiltrating, evapotranspiring and storing precipitation) will have to be replaced within the developed lands using low impact development practices so that increases in runoff and its negative environmental and flood damage impacts on the watershed can be avoided.

# Good Things are Beginning to Happen in the Watershed

Watershed partners are taking the lead and moving forward with implementing best management projects and educational activities recommended in the watershed plan. Join the watershed team and take the lead on a project in your neighborhood or community.

***Stream Maintenance*** ➤
*Liberty Prairie Area Homeowners Association: Stream cleanup of Bull Creek North with assistance from Libertyville Township and the youth conservation corps.*

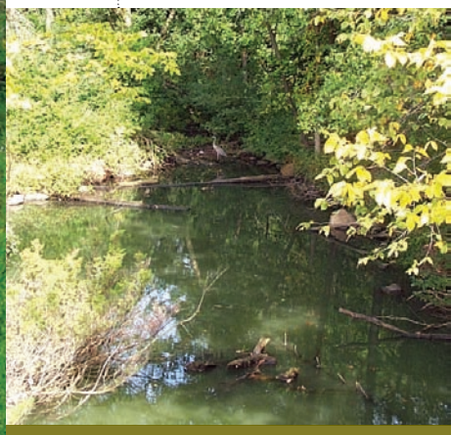
***Pollutant Filter***
*Loch Lomond Property Owners Association: Banned phosphorus in fertilizers; conducts lake education days; and planted native shoreline plants as a demonstration project.*

***Natural Area Restoration***
*Liberty Prairie Conservancy and Libertyville Township: Sedge Meadow Wetland restoration at Liberty Prairie.*

# Low Impact Development

Lake County is constructing a central permit facility in Libertyville that includes a bioswale, vegetated swales, rain gardens, wetland detention and a green roof to capture, filter and infiltrate runoff.

***Shoreline Stabilization/Pollutant Filter***
*Libertyville Parks Department: Regraded and stabilized shoreline with native buffer around Butler Lake*



***Stream Restoration***
*St. Mary's University: Has been awarded a grant to restore Bull Creek South Stream reach on their property.*

***Runoff Reduction***
*Mundelein Park District: Aquatic center developed with parking lot bioswale and landscaping with deep rooted plants to infiltrate runoff.*

# What can we do?

**...the 10 best things that could happen in the next 10 years.**

## Watershed council

- Educate and motivate residents, businesses, institutions and communities to reduce the amount of pollutants they contribute.
- Work with communities to develop a collaborative green infrastructure preservation strategy

## Communities & county

- Adopt the watershed plan
- Require low impact development standards
- Retrofit stormwater facilities, government properties and transportation corridors to reduce runoff and improve water quality
- Use less road salt and look to use of alternative de-icers
- Ban phosphorus in fertilizers

## Residents and businesses

- Convert large areas of yards, commercial and institutional, lawns, and stormwater facilities to native landscaping
- Create rain gardens and disconnect your rooftop runoff from the storm sewer system

## Lake and streamside property owners

- Establish/maintain native plant buffers along shorelines and stream channels

*Prairie Corridor, Native roadside plantings*

*Conservation Development, Prairie Crossing*

*Education, Watershed tour*

*Stewardship, Liberty Prairie*