

GENEVA LAKE MANAGEMENT PLAN

INTRODUCTION

Geneva Lake is a valuable resource for all of southeastern Wisconsin, especially for the communities located on its shore. Increases in population and development will continue to add



Figure 1: Geneva Lake, WI

pressure to develop and use Geneva Lake and its watershed.

The Lake Management Plan for Geneva Lake offers the water quality and resource protection needed

to meet those demands and maintain Geneva Lake’s unique characteristics and quality. Over the years many efforts have been made by various local, state, and federal agencies to protect Geneva Lake. It is hoped that the Geneva Lake communities adopt this Lake Management Plan to help guide them in future land and lake use decisions.

This Summary Information Sheet is a summary of a more comprehensive Lake Management Plan for Geneva Lake, released in July 2008. The complete management plan is the second edition of the Southeastern Wisconsin Regional Planning Commission’s (SEWRPC) Community Assistance Planning Report #60, first released in 1985. Most of the information in the new management plan is carried over from the first edition. Updated lake data came from a recent comprehensive *Diagnostic Feasibility Study* that was done cooperatively by the United States Geological Survey, the Wisconsin Department of Natural Resources, the Geneva Lake Environmental Agency, the University of Wisconsin Extension, and the local communities.

The Management Plan identifies Geneva Lake’s physical, chemical, biological and social resources. It establishes water quality and recreational *use objectives* along with recommendations for the most cost effective management practices. Some preliminary implementation costs and who is best suited to implement the recommendations are also presented in the complete management plan in more detail.

PHYSICAL CHARACTERISTICS:

Geneva Lake is a deep glacial lake somewhat unique to southeastern Wisconsin (Table1).

Table 1. GENEVA LAKE FACTS	
Surface Area.....	8.3 miles ² (5,262 ac)
Watershed Area.....	20.4 miles ² (13,045 ac)
Shape	
Maximum length.....	7.6 miles (Fontana to Lake Geneva)
Maximum width.....	2.1 miles (Williams Bay to South Shore)
Minimum width	0.5 miles ("The Narrows" Linn Township)
Shoreline Length.....	20.1 miles
Depth	
Maximum.....	141 ft
Average.....	57 ft
Less than 10 ft.....	11%
10 to 70 ft.....	45%
More than 70 ft.....	44%
Volume.....	320,945 acre-ft
Residence Time ^a	13.9 years
^a length of time water remains in the lake.	
Source: SEWRPC and GLEA	

Italicized, blue colored words are defined in the glossary on the last page of this Summary Information Sheet
This Summary Information Sheet is a shortened form of a more in depth report titled “Lake Management Plan for Geneva Lake Walworth County, WI”. Community Assistance Planning Report NO. 60, 2nd Edition, prepared by Southeastern Wisconsin Regional Planning Commission.

Geneva Lake is located in south-central Walworth County, in southeastern Wisconsin. Located on its shores are the Villages of Fontana-on-Geneva Lake and Williams Bay, the City of Lake Geneva, and the Towns of Linn and Walworth. Within Geneva Lake's watershed are lands within the Towns of Delavan, Geneva, and Bloomfield and the Village of Walworth (Figure2).

The atmosphere is the major source of water, contributing 48% of the annual water input. Other sources and their annual contribution are; surface runoff 28%, stream flow 18% and groundwater 6%. Major water losses are the White River 60% and evaporation 40%. Recent groundwater modeling has found that groundwater may play a bigger role in Geneva Lake's annual water budget.

Geneva Lake's watershed is primarily glacial soils with glacial moraines forming the hills surrounding the lake basin. Geneva Lake is 7.6 miles long and lies on a SW / NE axis. It has an irregular shoreline of 20.1 miles. It is the second deepest natural occurring lake in Wisconsin outside of the Great Lakes. Geneva Lake is a headwater lake which drains east into the White River through a controlled outlet structure of a dam and spillway. The White River further drains east to the Wisconsin / Illinois Fox River which flows south into the Illinois River.

MANAGEMENT OBJECTIVES

Water Use and Water Quality Standards have been established for Geneva Lake and are the basis for Geneva Lake's management objectives. The use objectives call for maintaining full recreational use and coldwater sport fisheries for Geneva Lake. Studies conducted over the years indicate that Geneva Lake is generally meeting those objectives. Water Quality Standards supporting warm water fishery and full recreational use objectives apply to the surface waters and concentrations measured during the spring when the lake water is mixing. These standards are listed in Table 2.

Table 2: Recommended Water Quality Standards to Support Recreational, Warm Water Fish and Aquatic Life.

Water Quality Parameter	Water Quality Standard
Maximum Temperature.....	89 °F
pH Range	6.0 - 9.0 units
Minimum Dissolved Oxygen.....	5.0 mg/l
Maximum Fecal Coliform.....	200/400MFFCC/100ml
Maximum Un-ionized Ammonia Nitrogen.....	0.02mg/l
Maximum Total Residual Chlorine.....	0.02mg/l
Maximum Total Spring Phosphorus.....	0.02mg/l
Other.....	^a

^a Unauthorized concentrations of substances are not permitted that alone or in combination with other material present are toxic to aquatic life or interfere with recreational use. Floating or submerged debris, oil, scum or other material shall not be present or deposited on the shore or bed of the lake nor shall they interfere with public rights.

Source: SEWRPC and GLEA

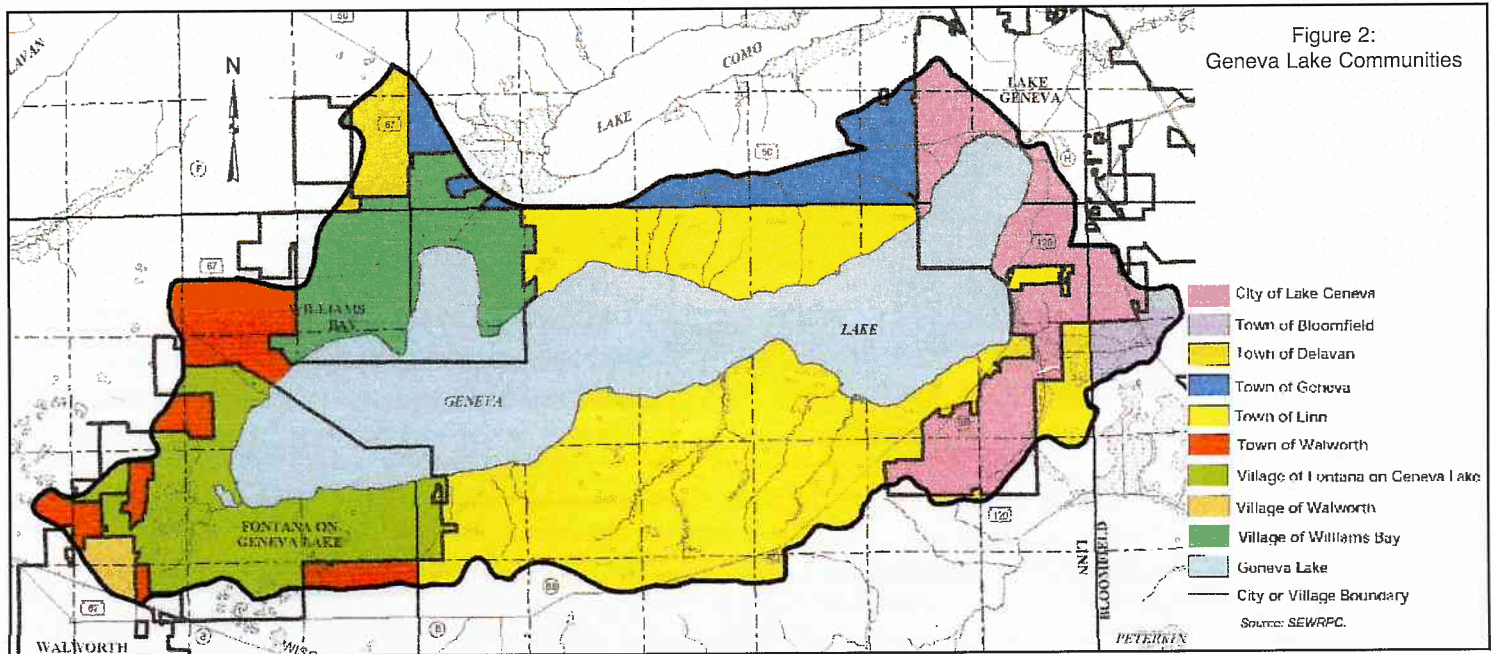
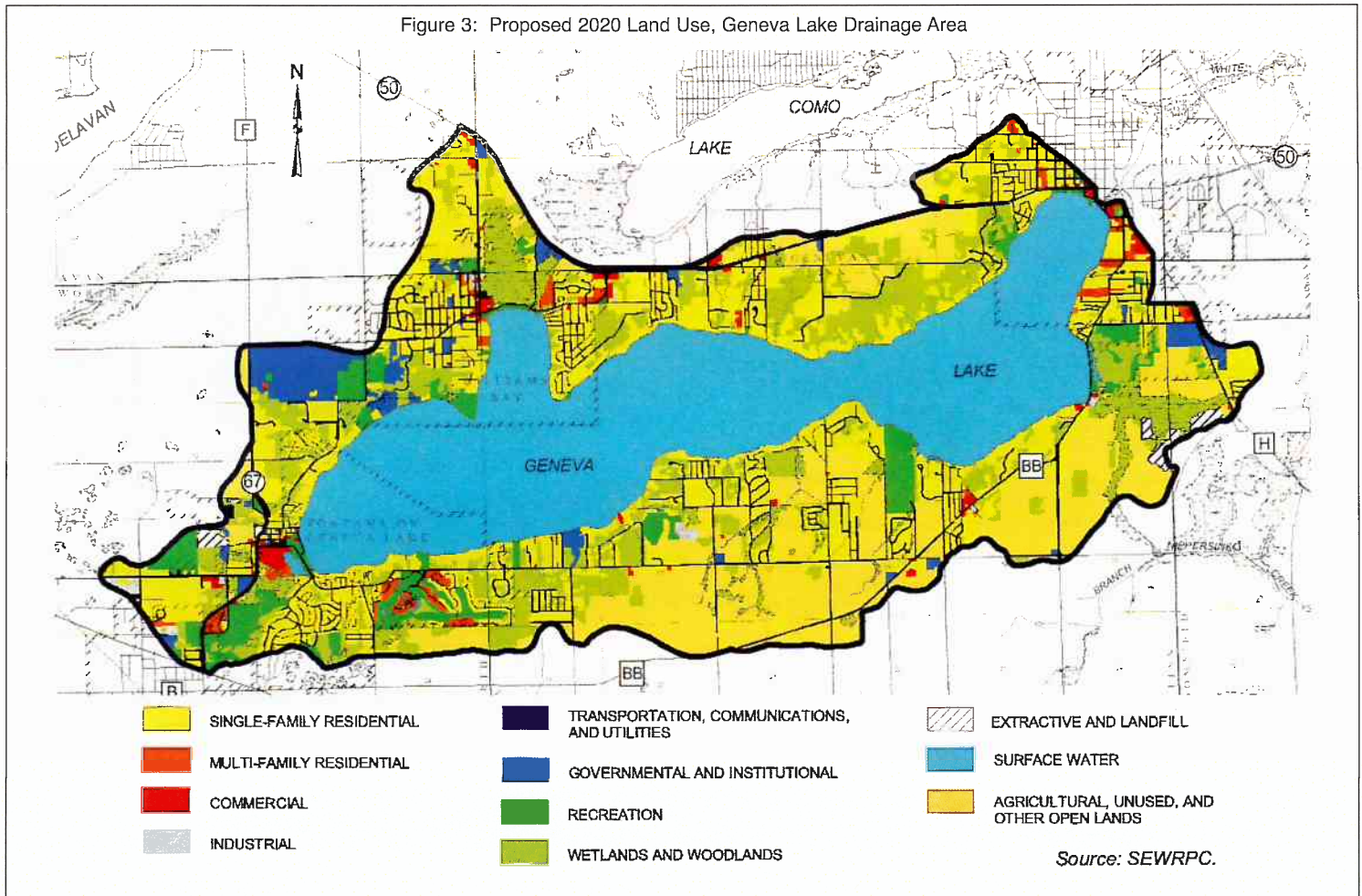


Figure 2: Geneva Lake Communities

GENEVA LAKE'S MANAGEMENT PLAN

A detailed and comprehensive Lake Management Plan for Geneva Lake was prepared by Southeastern Wisconsin Regional Planning Commission for the Geneva Lake Environmental Agency. A major component of the lake management plan is the land use plan within the lake's *watershed*. Water pollution problems and their solutions are strongly linked to people's activities in the *watershed*. Thus a good land use plan must consider and address the type and locations of land uses as they will determine the character, magnitude and distribution of *non point pollution* sources. Geneva Lake's land use plan, (Figure 3) complements and refines the adopted regional water quality management plan, the regional land use plan and the Walworth County land and water resource management plan.



Major components and recommendations of Geneva Lake's management plan are:

Land Use

- Local communities adopt zoning guidelines set forth in the regional land use and County development plans.
- Historic lake front dwelling densities and setback requirements are maintained.
- Establish strong storm water management ordinances with periodic review.
- Protect environmentally sensitive and unique lands.

Pollution Abatement

- Good urban and rural *non point source* pollution abatement throughout the entire watershed.
- Promote urban housekeeping and yard care practices through public education.
- Uniformly develop and enforce strong construction site erosion control and storm water management.
- Conduct periodic review and refinement of *sewer service area* needs within sewered areas.
- Implement strong *onsite sewage disposal system* management.

Water Quality and Quantity

- Continue ongoing lake water quality monitoring program.
- *Watershed* monitoring as needed.
- Continue Municipal beach bacterial testing.
- Additional studies as needed to better understand the lake and its biota.
- Better understand and retain the lake/groundwater relationship.

Aquatic Biota

- Maintain and protect all fish habitat especially shoreline and *littoral zone* fish habitat.
- Continue stocking of selected game fish and monitoring of rough fish population.
- Implement aquatic plant management plan with updated plant surveys.

- Cleanup floating plant fragments.
- Continue to monitor for invasive species and their distribution.

Water Use

- Enforce boating and pier regulations

Information/Education Programs:

- Aquatic Plant Management.
- Invasive species.
- Safe recreational use.
- The need for shoreline protection.
- *Watershed* awareness.
- Centralized and decentralized wastewater management.
- Lake stewardship.

COSTS

Many of the recommended management efforts are extensions of ongoing efforts already being carried out by the communities and local organizations. Thus some of their costs are already being covered. Refining and upgrading some of these efforts may require additional funding. Other costs can be offset by grants and cost share programs at the State and Federal level.

An exact cost for the implementation of this plan will depend upon the number of acres involved in individual practices, the amount of volunteers and the effort individual land owners are willing to commit. The complete Lake Management Plan for Geneva Lake estimates a 2000 – 2020 capital cost of \$303,600 and an annual operation and maintenance cost of \$181,600 for plan implementation.

GLOSSARY

annual water budget – A breakdown of the sources and amounts of water contributed and lost by a lake.

Diagnostic Feasibility Study – A comprehensive lake study.

glacial moraines – Hills formed by the glaciers.

headwater lake – A lake located at the top of a regional drainage basin.

Water Quality Standards- Goals for managing water quality.

use objectives – Management objectives based upon a preferred use.

non point source – Pollution from diffuse sources.

sewer service area – An area designated to be served by a wastewater treatment plant.

onsite sewage disposal system – A septic system.

watershed – The area of land that drains to a given surface water.

littoral zone – The shallow open water area of a lake.

This Summary Information Sheet is the seventh in a series of information flyers about Geneva Lake and its management. They are educational publications that summarize larger, more detailed reports on Geneva Lake. These summaries are prepared by the Geneva Lake Environmental Agency with the assistance of the original authors. SIS #7 is made financially possible by the generosity of the Lake Geneva Garden Club and the WDNR Lake Planning Grant. Additional copies are available by writing us at the Geneva Lake Environmental Agency, w P.O. Box 914, Williams Bay, WI 53191, calling 262-245-4532, or emailing glea@genevaonline.com.