

## watershed goals and objectives

The following water quality and land use recommendations have been derived from the outcomes of the four meetings held by the Saratoga Lake Watershed Advisory Committee:

### Watershed Water Quality

**Goal:** Improve the overall quality of Saratoga Lake and all its tributaries. Reduce nonpoint source discharges of phosphorus, sediment, pathogens and toxic substances to Saratoga Lake to promote a healthy and diverse ecosystem and maintain the socio-economic vitality of the watershed.

### Objectives and ideas to date:

- Consider the potential positive impact regarding the export of nutrients out of the watershed (to Mechanicville) due to the potential drawing of water from the lake for water supply.
- The Committee should direct its attention to stormwater issues since point sources appear to be under control.
- Review DEC's newly promulgated stormwater regulations to see how they may apply. Note construction best management practices.

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- Determine boundaries of deep aquifers and determine whether they recharge Saratoga Lake.
- Address the long-term impact of on-site individual wastewater systems.
- Obtain water quality testing equipment that communities can share.
- Locate stormwater discharge sites from existing subdivisions.
- Locate state highway stormwater discharge areas from DEC.
- Locate and digitize culverts, drainage features and other stormwater management devices.
- Review standards for roads in subdivisions.
- Concentrate on solutions to lessen the impact from winter runoff.
- Utilize DOT list of upcoming projects to plan for stormwater and erosion control upgrades.
- Construct new hydrologic gauging station back on the lower the Kayaderosseras Creek.
- Evaluate the impact of zebra mussels on water quality in Saratoga Lake.
- Prepare individual maps of towns showing streams leading to Kayaderosseras Creek and Saratoga Lake.

- Support the comprehensive-planning efforts going on in eight of the watershed communities.
- Create a set of graphics that will explain the history of land use changes in the watershed and future anticipated changes.
- Review natural resource protection standards from individual ordinances of the watershed communities. Request input regarding what techniques are most practical, effective and affordable.
- Create model set of standards that uniformly address stream protection. Present ideas to planning committees for their consideration to be included in comprehensive plans.
- Appoint a full-time lake advocate circuit rider to provide education and outreach to town planning boards.
- Towns should include information about existing and planned standards for stream protection in municipal newsletters and bulletins.
- Towns should support staff and planning board training for the site planning and long-term enforcement of stream corridor management through local government workshops.

These ideas are the start of the recommendation process. Please give the Advisory Committee your feedback via the Saratoga Lake Watershed Management Plan website: [www.saratoga-lake.org](http://www.saratoga-lake.org)

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# land to lake perspectives

The Saratoga Lake Watershed Newsletter

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## chairmen's column

The Watershed Advisory Committee has met three times since the introductory meeting in June of last year. They have analyzed issues relating to water-based recreation, the history of water quality, trends in land use and development, and the potential development of a model set of standards for natural resource protection.

During the January meeting an extensive discussion took place about how buffers could work along stream corridors in the various individual communities. Several issues were revealed especially regarding the logistics of how a buffer should be measured and the most effective width the buffer needs to be. It was suggested that stream protection might be better addressed under provisions in site plan review. A complete discussion of the topic can be found in this newsletter. Consensus of the Committee was that the development of a set of uniform standards for stream corridor protection would be a valuable product for this watershed management process.

We are also pleased with our efforts to extend education and outreach through both the newsletter and personal visits to most of the local planning boards in the 13 communities in the watershed. While the first visit concentrated on the value of watershed protection, the second round of presentations, planned for February, will focus on improved site plan review for the control of on-site stormwater and erosion. Planning strategies, best management practices associated with the construction phase, and follow up monitoring are essential elements of a good site plan.

Please continue to join us for the upcoming meetings. The goals, objectives and recommendations will be formulated from Committee discussions and your input on the website. We need your perspective and your ideas for the watershed management plan.  
Lynnwood Taylor and Bob MacMillan  
Co-Chairmen

### Future 2001 Meetings for the Saratoga Lake Watershed Advisory Committee

All Meetings are open to the public and held at the Ballston Spa County Complex Cooperative Extension Auditorium-Building 550 West High Street • 7:00 to 9:00 PM

Thursday, April 5th: Watershed Goals, Objectives and Recommendations

June and July  
Public Outreach Meetings

Thursday, August 2nd:  
Presentation of the Watershed Management Plan

## expanding development pressure in watershed

### Introduction

It is well documented that changes in water quality are directly and indirectly related to changes in land use. Lands that are essentially undeveloped have a greater capacity to absorb pollutants found in urban runoff such as sediment, nutrients, bacteria, oil, grease, trace metals, pesticides and other toxic metals and road salt. Lands that are developed create large areas of impervious surfaces which tends to create an increased runoff that runs off at a much higher rate than runoff that is stored, whether it be natural or manmade.

To look at how changes in land use might be impacting the Saratoga Lake watershed, we can review historical land use data throughout the thirteen communities in the watershed. Advances in Geographical Information Systems (GIS) allows the data to be narrowed as to focus only on information from those parts of the communities that are actually in the watershed. Land use changes are themselves related to shifts in both the animal and human population. This report will study both population and land use changes to show how these changes have potentially affected the water quality in Saratoga Lake.

This part of the study focuses on population changes, shifts in land uses, and growth and development patterns, as measured by building permit data and subdivision activity. Other factors, such as seasonal population, point discharges and sewage disposal are significant, but are not fully evaluated at this stage of the study.

### Trends in Watershed Population

The watershed covers part or all of thirteen communities in Saratoga County, many among which are the fastest growing communities in the state of New York. In fact, according to the Census Bureau, over the past twenty years, Saratoga County has had the third highest rate of population change in the state. Utilizing 2000 estimates from Capital District Regional Planning Commission (CDRPC) and estimated percentages of total population inside the watershed, total population grew 17.0% from 1980 to 1990 to 88,235 in 2000.

This represents a twenty-year watershed population increase of 17,684 people or a twenty percent overall increase in population. The highest percent increases were found in the towns of Greenfield (32.4%), Wilton (43.7%) and Malta (48.5%). The greatest change in actual numbers were Malta (4,929), Milton (2,971), Wilton (2,804), Greenfield (2,202) and Saratoga Springs (1,809).

Population change can also be measured in density or persons per square mile for the year 2000. Ballston Spa has the highest density as expressed in persons per square mile (3464), followed by Saratoga Springs (905), Malta (483), Milton (445), Wilton (358), and Ballston (280). The most significant upward shifts in density between 1980 and 2000 occurred in Ballston Spa (520), Malta (234), Wilton (156), and Milton (83).

### Land Use Shifts

With population changes come corresponding changes in land use. Saratoga County began to realize significant land use changes following the construction of the Adirondack Northway. Widespread suburbanization occurred in the north-south corridor along this highway. Saratoga Lake and its watershed are located in this corridor and naturally people were drawn to the area. As people settled, businesses grew and the amount of impervious surfaces in the watershed continued to climb. The greatest changes in land use type occurred to agriculture which was 13 percent of the land use base in 1976 and in 2000 represented only slightly over 4 percent. Some of these lands likely became distributed to the forest category, which gained over 14,000 acres. Some of it was also lost to the urban sector, which nearly doubled in acreage, rising from 2.5 percent of the total land area in 1976 to 4.26 percent in 2000.

The shift in land use can easily be identified in the loss of working farms. In 1975, there were an estimated 49 active farms in the watershed. Today, the 35 active watershed farms remaining are primarily clustered in the towns of Milton, Ballston and Saratoga. Contemporary farms are considerably smaller and this accounts for the tremendous loss in acreage being used for agricultural purposes.

### Growth and Development Patterns

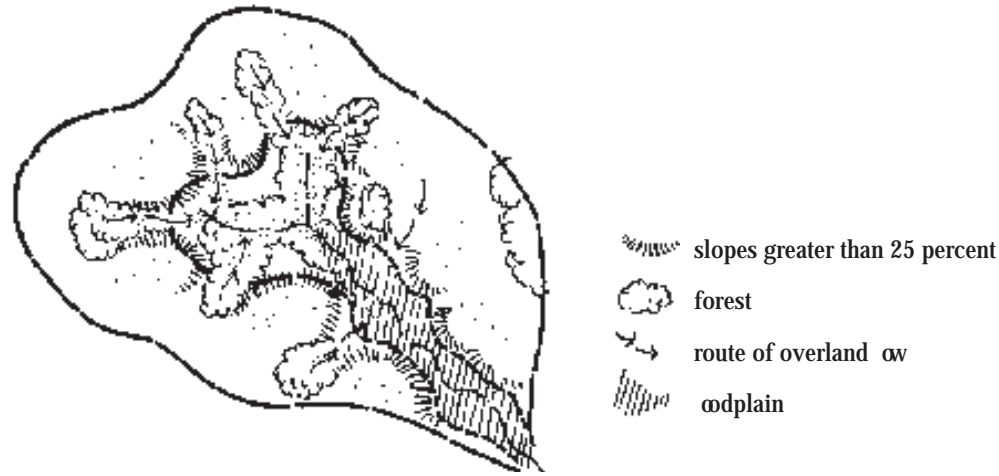
The Saratoga Lake Watershed Land Use Map has been developed to show current land use distributions. Different types of development are occurring throughout the watershed. The towns having the highest level of residential and commercial permits issued over the last eight years were Greenfield, Malta, Saratoga Springs, and Wilton. Most of the commercial growth occurred in Wilton along the Route 50 corridor. Commercial businesses create the highest amount of impervious surfaces. The committee will examine whether the present mechanisms for stormwater and erosion control along streams are adequate in each of the communities. Eight out of the thirteen communities are in the process of developing or updating a comprehensive land



## site analysis

### Protect Sensitive Areas

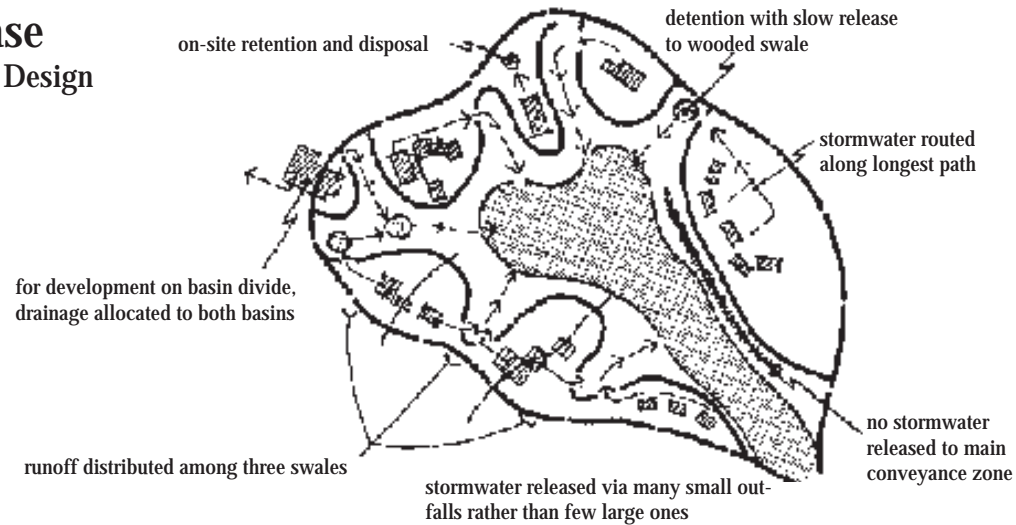
- Establish Buffer Network
- Wetlands
- Waterways
- Flood Plains
- Steep Slopes
- Habitats
- Forests



## planning & design phase

### Reduce Impervious Cover in Site Design

- Limit Clearing
- Cluster Buildings
- Pervious Parking Surfaces
- Narrower Streets
- Phase Construction
- Require Bonding



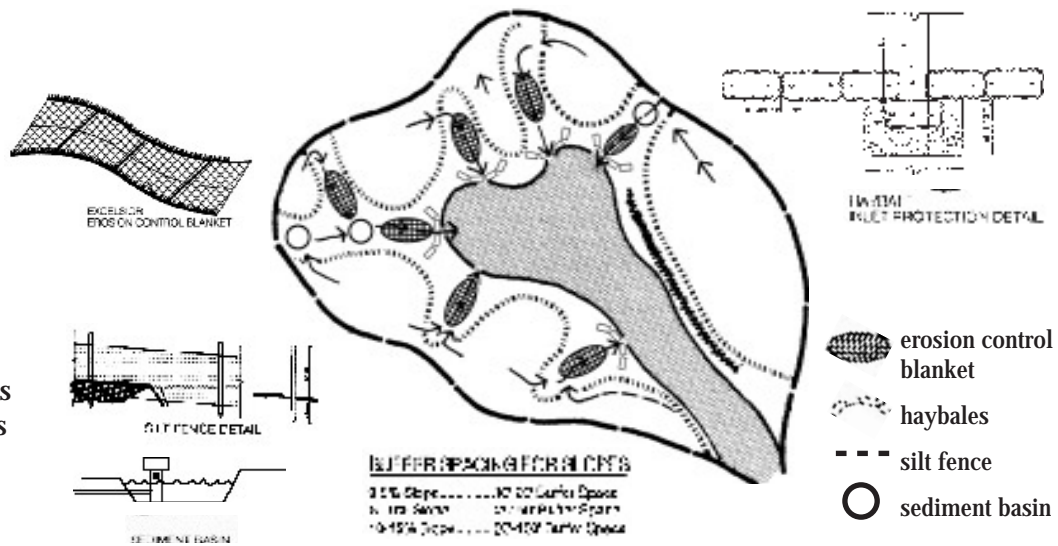
## construction phase

### Control Erosion

- Limit Grading
- Stabilize Drainageways
- Maintain Buffers
- Protect Steep Slopes
- Perimeter Controls

### Control Stormwater

- Install Setting Devices
- Assess Practices After Storms
- Schedule Regular Inspections



## post construction

- Treat Quality of Stormwater Runoff
- Maintain Stream Protection Measures
- Restore Site to Pre-Construction Conditions
- Home Owner Monitor Site Conditions

## considerations for developing a model watershed protection overlay

### Purpose and Need

The purpose of an overlay district or zone is to protect natural resources without disturbing the expectations created by existing zoning ordinances. Existing provisions may properly regulate the relevant district, but more specific provisions may be needed to accomplish other important land use objectives.

An overlay district is created by local legislature by identifying a special resource or development area and adopting new standards that apply in that area in addition to the zoning ordinance. An overlay is superimposed over existing district lines. Provisions in the overlay typically impose a greater level of restrictions on the development of land but only where development as permitted under regular zoning may threaten the viability of the underlying resource. An overlay is typically adopted by a municipality to encourage appropriate development in a special area or when zoning itself is not considered to be enough to protect a certain area.

### Minimum Contents for a Watershed Buffer Overlay Zone

- Section on environmental justification
- Goals and objectives clearly tied to the Watershed Management Plan
- Buffer standards that include width and vegetative requirements and associated vegetation removal rates
- Clear standards regarding the beginning point in which to measure the buffer
- Variance provisions for environmental cause and hardship
- Section on enforcement
- Grandfather clause
- List of permissible, conditional and prohibited uses and activities

### Performance Standards

The goal of performance standards is to protect local waterways of all sizes whether perennial or intermittent. This can be achieved by establishing an overlay with a buffer network. Once this is in place, special performance standards can be developed that reduce the amount of impervious cover in site design, limit erosion during the construction phase, and treat the quality of stormwater runoff. Certain land uses or structures can be prohibited from the buffer area. Monitoring and enforcement of performance standards are an extremely important component of the overlay zone.

### Buffer Requirements

Buffer strips, or zones are a common method used to protect water resources. A buffer zone of 100 feet represents the regulated area adjacent to wetlands in New York State. For purposes of regulatory oversight the zone within 50 feet of the top of the stream banks may be subject to NYS DEC permits for many streams.

The width of buffer zones can be highly variable and is influenced by the slope and quality of the vegetation in the buffer zones. Buffers with low slope are more effective than a steeply sloped buffer. A buffer that is composed of trees, shrubs and a minimal amount of grass is more effective than a pure grass buffer strip.

To select an effective buffer width, the goals of the buffer must be identified. In this case, water quality protection is the goal rather than providing green space or wildlife corridors.

In order to operate properly, a buffer zone needs to be located above the normal floodplains and must receive water over a broad-crested front rather than a single point. The normal floodplain of a small stream is readily identified along the bank or section of land that has been regularly eroded from past seasonal flooding. This erosion may not be a bare open scar but will appear as a slumped grass slope or shrub slope. Lines of debris are also useful in identification of a stream

discharged from a pipe. As a stormwater movement technique, sheet flow from limited impervious surfaces is the best means to load stormwater to a buffer zone. If stormwater comes by a pipe or even a roof gutter discharge it must be spread out over the widest possible area in order not to overload the system. Buffer zones work best around low-density development such as housing, farmsteads and small commercial facilities.

Conceptually, a buffer zone needs to be at least 30-50 feet wide and outside the area of seasonal flooding. The vegetation should be a zone of grass to spread the stormwater, and shrubs and trees should surround the immediate stream corridor. Finally, any buffer zone, especially a small high quality, heavily planted zone of shrubs, is better than no buffer at all. Local governments should be encouraged to design their programs to be responsive to the economic concerns of the development community. The purpose of the buffer is to put distance between development activities and the stream, not to discourage development from taking place.

For more details see Tom Schueler, Site Planning for Urban Stream Protection, The Center for Watershed Protection, 8737 Colesville Road, Suite 300, Silver Springs, Maryland 20910 and the Metropolitan Washington Council of Government.

	Buffer Width at 50% Removal Rate	Buffer Width at Maximum Pollutant Removal Rate
Total Suspended Solids	50 Feet	70% at 180 Feet
Total Phosphorous	25 Feet	60% at 40 Feet
Total Nitrogen	25 Feet	60% at 40 Feet

seasonal high water during the spring. These indications of seasonal high water should be the stream side edge of the buffer zone. It is important to protect the floodplain area since vegetation buffers are less effective in the early spring when the plants are not actively growing.

The table above shows the pollutant removal by vegetation buffers primarily based on grass filter strips. The table shows the distance at which 50% removal of the selected pollutant occurs. The table also shows that increasing distance does not dramatically improve the ability of the buffer to remove nutrients.

In order to obtain the benefits of a buffer, the stormwater must enter the buffer areas along a broad front. Stormwater cannot be








### Enforcement

Strict enforcement during and after site development is necessary to ensure buffer standards are enforced and those buffer pollution control mechanisms remain intact after establishment. Ongoing, scheduled inspections during the construction phase are imperative. Compliance with buffer requirements should be part of the occupancy permit so that the municipality can ensure the buffer area has been conserved and that any regrading or revegetation has been completed. Guidance and training in proper buffer management techniques will be necessary for both private owners and municipalities.

Questions? Call Dean Long or Tracey Clothier at the LA Group, P.C. at 587-8100 or visit [www.sara-lake.org](http://www.sara-lake.org)

# watershed map

**legend**

-  streams
-  creeks and kills
-  body of water
-  watershed boundary
-  highways
-  town borders
-  urban area

## what is a watershed?

Overland flow moves only a short distance over the ground before it gathers into minute threads of water. These threads merge with one another, forming rivulets capable of eroding soil and shaping a small channel. This system of channels, is called drainage network, and it represents nature's most effective means of getting water off the land. The area feeding water into the drainage network is the drainage basin, or watershed.

Modern land development often alters drainage networks by obliterating natural channels, adding man-made channels, or by changing the size of drainage basins. Deforestation and agriculture may initiate soil erosion, gully formation, and expansion of the drainage network. Discharges are in turn larger, large flows occur with higher frequencies, erosion is greater, and water quality can be expected to decline.

