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APPENDIX 1: LIST OF PARTICIPANTS

Funding Agency:

New York State Department of State, *Division of Coastal Resources*
Local Waterfront Revitalization Program

Applicant/Grantee:

Town of Livonia
Timothy Wahl, *Supervisor*

Lead Agency:

Livingston County Planning Department
Project Manager - David Woods, *Planning Director*

Policy Committee:

Full (voting) members:

Chairman - *Supervisor, Town of Livonia* - Timothy Wahl
Supervisor, Town of Conesus - Christine Rumble
Supervisor, Town of Geneseo - Weston Kennison
Supervisor, Town of Groveland - James Merrick
Supervisor, Town of Sparta - Mark Schuster
Mayor, Village of Avon - Richard Burke
Mayor, Village of Geneseo - Richard Hatheway (represented by Peter Bondi, *Trustee*)
Mayor, Village of Livonia - Calvin Lathan
Chairman, Livingston County Board of Supervisors - James Merrick (represented by Livingston County Administrator, Dominic Mazza)

Advisory (non-voting) members:

President, Conesus Lake Association – Gregory Foust (Alternate - Donald Wetzel)
Chairman, Livingston County Water & Sewer Authority - Frank Riedman
Representative of Livingston County Planning Board - Ruth Lea (Alternate - Donald Richards)
Representative of Livingston County Environmental Management Council - William McCleary (Alternate - Jean Meekin)
Representative of Cornell Cooperative Extension of Livingston County - David Thorp (Alternate - Barbara Schirmer)
Representative of Livingston County Farm Bureau - Daniel Mulvaney
Representative of Livingston County Chamber of Commerce - Thomas Fraser, P.E. (Alternate - Walter Isaac)
Representative of USDA Natural Resources Conservation Services - James Booth
Representative of USDA Farm Services Agency - Dean Pendergast (Alternate - Glenda Kelly)
Representative of Livingston County Sheriff's Office, Navigation Patrol - Sgt. Albert Brinkerhoff
Representative of NYSDOT - Greg Kerrick, *Resident Engineer for Livingston County*
Representative of Livingston County Highway Department - Donald Higgins, *Highway Superintendent*
Members of the Planning Committee (see below)

Mailing List

Mark Walker, *Supervisor, Town of Springwater*

Planning Committee (Working Group):

Chairman - David Woods, *Planning Director, Livingston County Planning Department*
Elizabeth Moran, *EcoLogic, LLC*
Ana Fernandez, *EcoLogic, LLC*

Heather Hogarty, *Planner, Livingston County Planning Department*
Joshua Price, *Planning Assistant, Livingston County Planning Department*
Joan Ellison, *Director of Public Health, Livingston County Department of Health*
James Mazurowski, *Director of Environmental Health, Livingston County Department of Health*
Richard Davin, *Conesus Lake Watershed Inspector, Livingston County Department of Health*
Catherine Muscarella, *Executive Director, Livingston County Water and Sewer Authority*
Peter Kanouse, *District Manager, Livingston County Soil & Water Conservation District*
David Zorn, *Executive Director, Genesee/Finger Lakes Regional Planning Council*
Thomas Pearson, P.E., *Regional Water Engineer, NYSDEC Region 8*
Jack Baldwin, *Conesus Lake Association*

Mailing List

Timothy Wahl, *Chairman of Policy Committee*
Mark Schuster, *Chairman of Agricultural Committee*
Donald Wetzel, *Public Education Subcommittee Volunteer*
Dr. Joseph Makarewicz, *SUNY Brockport*
Dr. Isidro Bosch, *SUNY Geneseo*

Agricultural Committee:

Agricultural Producer members:

Mark Schuster, *Sparta, Chairman*
Daniel Mulvaney, *Conesus*
Ronald Maxwell, *Geneseo*
Jon White, *Groveland*
Christopher Cicero, *Livonia*
John Stevenson, *Springwater*
Thomas Platten, *Agraculver Seed*

Agency representatives:

David Woods, *Livingston County Planning Department*
Heather Hogarty, *Livingston County Planning Department*
David Thorp, *Cornell Cooperative Extension of Livingston County* (Alternate-Barbara Schirmer)
Nate Herendeen, *Cornell Cooperative Extension of Niagara County*
John Hanchar, *Cornell Cooperative Extension of Livingston County*
Peter Kanouse, *Livingston County Soil and Water Conservation District*
James Booth, *USDA Natural Resources Conservation Service*
Dean Pendergast, *USDA Farm Services Agency* (Alternate-Glenda Kelly)

Mailing List

Timothy Wahl, *Chairman of Policy Committee*

Public Education Subcommittee:

Chairman - David Woods
Heather Hogarty
Timothy Wahl
Weston Kennison
Richard Davin
Donald Wetzel
David Thorp
Daniel Mulvaney
Catherine Muscarella

APPENDIX 2: SUMMARY OF CLWMP WORK GROUP ACTIVITIES

Description:

Four Work Groups were formed in December 2001 to address specific issues in the watershed, identify data gaps, and to formulate specific recommendations on nonpoint source pollution reduction for the Watershed Management Plan. These recommendations were forwarded onto the CLWMP Policy Committee for consideration and potential inclusion in the Draft Conesus Lake Watershed Management Plan. Each work group's membership included representatives from the Policy Committee, experts in the work group's field of inquiry, state and federal agencies in the watershed, and concerned citizens. The Work Groups include the following:

- **Lake Management Issues Work Group:** Dealt with issues occurring in the Lake itself, including aquatic weeds, algae, fish and wildlife.

Participants

David Woods, *Work Group Chairman, Livingston County Planning Department*

Heather Hogarty, *Planner, Livingston County Planning Department*

Timothy Wahl, *Supervisor, Town of Livonia*

James Merrick, *Supervisor, Town of Groveland*

Dennis Witte, *former Supervisor, Town of Conesus*

Wes Kennison, *Supervisor, Town of Geneseo*

Richard Burke, *Mayor, Village of Avon*

Richard Hatheway, *Mayor, Village of Geneseo*

Peter Bondi, *Village of Geneseo*

Joan Ellison, *Director of Public Health*

James Mazurowski, *Director of Environmental Health*

Richard Davin, *Conesus Lake Watershed Inspector*

Dr. Elizabeth Moran, *EcoLogic, LLC*

Cathy Muscarella, *Executive Director, Livingston County Water and Sewer Authority*

John Hauber, *NYSDEC Region 8, Division of Wildlife*

Matt Sanderson, *NYSDEC Region 8, Division of Fisheries*

Dr. Joseph Makarewicz, *SUNY Brockport*

Dr. Isidro Bosch, *SUNY Geneseo*

Joseph Kane, *former President, Conesus Lake Association*

Richard Palermo, *Conesus Lake Association*

Rusty Ehmman, *Conesus Lake Association*

Jack Baldwin, *CLWMP Planning Committee*

Don Wetzel, *CLWMP Public Education Subcommittee*

Nate Robinson, *Geneseo*

Jack Warner, *Groveland*

Angela Levenson, *Southern Shores Campground*

David Beecher, *Conesus*

Glenn Miller, *Conesus*

Peter Sear, *Livonia*

- **Sanitary Sewer/Septic System and Stormwater Management Issues Work Group:** Dealt with issues concerning sewer system expansion, septic system failure, riparian buffers, stormwater management, and impervious surfaces.

Participants

David Woods, *Work Group Chairman, Livingston County Planning Department*

Heather Hogarty, *Planner, Livingston County Planning Department*

Dennis Witte, *former Supervisor, Town of Conesus*

Dr. Elizabeth Moran, *EcoLogic, LLC*

Richard Davin, *Conesus Lake Watershed Inspector*

James Mazurowski, *Livingston County Department of Health*

Cathy Muscarella, *Conesus Lake County Sewer District*

Frank Riedman, *Livingston County Water and Sewer Authority*

Peter Kanouse, *Livingston County Soil and Water Conservation District*

Tom Pearson, *NYSDEC*

David Zorn, *Genesee/Finger Lakes Regional Planning Council*

Jack Baldwin, *Conesus Lake Association*

Ruth Lea, *Livingston County Planning Board*

Nate Robinson, *Town of Geneseo*

- **Recreational Use Issues Work Group:** Dealt with issues concerning watercraft regulation, boating safety, and waste disposal facilities.

Participants

David Woods, *Work Group Chairman, Livingston County Planning Department*

Heather Hogarty, *Planner, Livingston County Planning Department*

Timothy Wahl, *Supervisor, Town of Livonia*

Dennis Witte, *former Supervisor, Town of Conesus*

Wes Kennison, *Supervisor, Town of Geneseo*

James Merrick, *Supervisor, Town of Groveland*

Dr. Elizabeth Moran, *EcoLogic, LLC*

Sgt. Albert Brinkerhoff, *Livingston County Sheriff's Office, Navigation Patrol*

Richard Davin, *Conesus Lake Watershed Inspector*

James Mazurowski, *Livingston County Department of Health*

Richard Parker, *NYS Office of Parks, Recreation & Historic Preservation*

Matthew Sanderson, *NYS Department of Environmental Conservation*

Don Wetzel, *CLWMP Public Education Subcommittee*

Jean Meekin, *U.S. Coast Guard Auxiliary Flotilla 49*

Don Richards, *Town of Livonia, Livingston County Planning Board*

John Jansen, *Jansen Marina, Conesus*

George Sperry, *Town of Livonia*

Gary Beachel, *Town of Groveland*

Alice Ann Sattora, *Town of Groveland*

Glenn Miller, *Town of Conesus*

- **Road System Issues Work Group:** Dealt with issues concerning road construction, maintenance, ditching and salting.

Participants

David Woods, *Work Group Chairman, Livingston County Planning Department*

Heather Hogarty, *Planner, Livingston County Planning Department*

Timothy Wahl, *Supervisor, Town of Livonia*

Dennis Witte, *former Supervisor, Town of Conesus*

Dr. Elizabeth Moran, *EcoLogic, LLC*

Donald Higgins, *Livingston County Highway Superintendent*

Town and Village Highway Superintendents

Michael White, *Town of Conesus*

Richard Gray, *Town of Geneseo*

Gregory Adamson, *Town of Groveland*

David Coty, *Town of Livonia*

Dennis Palmer, *Village of Livonia*

Gary Kreiley, *Town of Sparta*

Gregory Kerrick, *New York State Department of Transportation*

Richard Davin, *Conesus Lake Watershed Inspector*

Peter Kanouse, *Livingston County Soil and Water Conservation District*

Joseph Kane, *former President, Conesus Lake Association*

David Zorn, *Genesee/Finger Lakes Regional Planning Council*

David Tuttle, *Town of Groveland*

APPENDIX 3: PUBLIC OUTREACH ACTIVITIES COMPLETED AS PART OF CLWMP DEVELOPMENT

1. Public Education Committee

A Public Education Subcommittee of the Planning Committee was formed to develop and disseminate information to the public regarding the Plan and the role that citizens can play in reducing nonpoint source pollution within the watershed.

2. Lecture Series

- Lecture #1: "Relationship between Zebra Mussels, Weed Growth, and Blue-Green Algae"
Presented by Charles O'Neill, Jr., New York Sea Grant, SUNY Brockport (Held on July 20, 1999)
- Lecture #2: "Water Quality and Watershed Protection - Hemlock Lake and Canadice Lake"
Presented by Don Root, Watershed Inspector, and Lenny Shantz, Laboratory Director, City of Rochester Water Treatment Plant at Hemlock Lake (Held on August 18, 1999)
- Lecture #3: "The Changes in the Conesus Lake Fisheries Resource: A Focus on the past 30 Years"
Presented by Matthew Sanderson, Senior Aquatic Biologist, NYSDEC (Held on December 8, 1999)
- Lecture #4: "Cultural Influences on Conesus Lake Over Time"
Presented by Dr. Kenton Stewart, SUNY Buffalo (Held on March 23, 2000)
- Lecture #5: "Lake-Friendly Lawn and Landscape Maintenance"
Presented by Brian Eshenaur, Horticulture Specialist, Cornell Cooperative Extension (Held on April 12, 2000)
- Lecture #6: "Weeds, Algae, and the Health of Conesus Lake"
Presented by Professor Sid Bosch, SUNY Geneseo, and Professor Joseph Makarewicz, SUNY Brockport (Held on May 3, 2000)
- Lecture #7: "What Makes a Lake Work? A Short, Easy Course in Lake Science"
Presented by Dr. Bill Harman, Director, SUNY Oneonta Biological Field Station, Cooperstown, NY (Held on August 29, 2000)

Lecture #1 through Lecture #7 (except Lecture #5) were videotaped. Tapes are available for the public to borrow at the Conesus Lake Association, the Public Libraries in the Villages of Geneseo and Livonia, the County Planning Department, and the County Department of Health.

3. Educational Brochures

Four educational brochures have been developed and distributed to the public:

- "Welcome Boaters". This brochure discusses rules and safety tips for boaters. It is available at the New York State launch off of East Lake Road and at the State fishing access site at the south end of the Lake.
- "Save Our Community: Conesus Lake Watershed." This brochure discusses best management practices to keep in mind for recreational activities, household chemicals, and landscaping and gardening. Other helpful hints for protecting water quality and phone contacts are provided.
- "Conesus Lake Watershed Management Plan: A Vision for the Watershed's Future." This brochure defines a watershed and discusses the purpose of the project and the values of a watershed management plan. It talks about the watershed management planning process and Conesus Lake impairments.
- "Protect Conesus Lake: Stop the Flow of Erosion and Sediment." This brochure details the erosion and sedimentation problem in the Conesus Lake watershed. It also provides information on the Model Erosion and Sediment Control Law.

The County Department of Health provides copies of "Soil Erosion Control for Single Family Dwelling Construction," prepared by the Cornell Cooperative Extension of Ontario County, to the shoreline Town Code and Zoning Enforcement Officers. The copies are distributed to developers and contractors at the time of application for a building permit for a single-family home.

In addition, the County Department of Health has prepared the "Conesus Lake Watershed: Preventing Pollution" fact sheet adapted from information provided by the Utilities Department of the City of Bellevue, Washington. This fact sheet discusses

ways to keep water clean around the home. It talks about care of lawns and gardens, car care, septic systems, swimming pools and spas, and special care around streams and wetlands.

4. Press Releases

Various press releases providing project update following Policy Committee and Planning Committee meetings have been issued.

5. Educational Workshops and Meetings

- An Erosion & Sediment Control Workshop was held on April 25, 2000. The Workshop, which was presented by Don Lake, Jr., Engineering Specialist with the New York State Soil & Water Committee, discussed the fundamentals of erosion and sediment control, best management practices, and enforcement and compliance issues. There were approximately thirty people representing municipal and county highway departments, code and zoning enforcement officials, contractors and other local and county officials.
- Conesus Lake Watershed & Agricultural Information Meeting. On March 19, 1999, an informational meeting was held with farmers in the watershed to give an overview of the watershed rules and regulations, present new state regulations pertaining to Concentrated Animal Feeding Operations (CAFOs) and nutrient management plans, lessons learned in the Lake LaGrange and Lake LeRoy watersheds, opportunities for possible grants and technical assistance, and report on Farm Service Agency and Natural Resource and Conservation Service programs.
- Representatives from the County Planning Department and/or Department of Health attended various public meetings upon request to continue educational efforts, including:
 - Conesus Lake Compact of Towns meetings
 - Conesus Lake Association meetings
 - Conesus Lake Association Lake Tours
 - NYS Federation of Lakes Conference
 - County Chamber of Commerce Ag Committee Decision- Makers Tour
 - County Chamber of Commerce & County Farm Bureau - Farmer & the Neighbor Dinner & Display
 - Livingston County Millennium Celebration

6. Conesus Lake Subwatershed Sign Project

Subwatershed boundary signs have been installed along the roadways to indicate to vehicles and pedestrians that they are entering a protected natural resource zone. It is anticipated that these signs will increase public awareness of Conesus Lake as a valuable natural resource.

7. Livingston County Website

A copy of the *State of Conesus Lake: Watershed Characterization Report* and this document are available on the Conesus Lake information website: <http://www.co.livingston.state.ny.us/conesus.htm>. This website also contains information on the Conesus Lake Watershed Inspection Program.

8. Educational Display for Conesus Lake Water Quality Issues

An educational display was created to provide the public general information about the Conesus Lake Watershed and the Conesus Lake Watershed Planning Project. The display is also used to educate about the Conesus Lake Watershed Inspection Program. It is expected that the display will be visible at major County events and at other programs, conferences, or meetings as the opportunity arises.

APPENDIX 4: MODEL EROSION AND SEDIMENT CONTROL LAW

Text in ***italic bold print*** indicates where the applicable text should be placed and the remaining text deleted. ***italic bold underlined print*** indicates optional items.

Section One: Short Title

This Law shall be known as the “Erosion and Sediment Control Law of the ***Town/Village*** of _____.”

Section Two: Findings of Fact

The (***Town Board/Village Board of Trustees of _____***) finds that uncontrolled drainage and runoff associated with land development has a significant impact upon the health, safety and welfare of the community by potentially causing substantial recreational, aesthetic, environmental and economic losses resulting from adverse impacts on community waters.

Specifically,

- a. Construction requiring land clearing and the alteration of natural topography tends to increase erosion;
- b. Stormwater runoff can carry pollutants into receiving waterbodies, degrading water quality;
- c. The increase in nutrients in stormwater runoff such as phosphorus and nitrogen accelerates eutrophication of receiving waters;
- d. Improper design and construction of erosion control devices can increase the velocity of runoff thereby increasing stream bank erosion and sedimentation;
- e. Siltation of waterbodies resulting from increased erosion decreases their capacity to hold and transport water, interferes with navigation, and harms flora and fauna;
- f. Development as defined in this law and activities associated with development, as well as land grading and earth moving can have a significant and potentially adverse impact on the environment.

Section Three: Purpose

The purpose of this local regulation is to safeguard persons, protect property, prevent damage to the environment and Conesus Lake ***and Hemlock Lake***, as well as all bodies of water or water courses in the ***Town/Village of _____***, and promote the public welfare by guiding and regulating the design, construction, and maintenance of any development or other activity which disturbs or breaks the topsoil or results in the movement of earth on land in the Conesus Lake ***and Hemlock Lake*** watershed(s).

Section Four: Authority

In accordance with (***Article 10 of the municipal Home Rule Law/Article 9 of the Town Law/ Article 4 and 20 of the Village Law***) of the State of New York, the (***Town Board/Village Board of Trustees***) has the authority to enact local laws for the purpose of promoting the health, safety or general welfare of the (***Town/Village***).

Section Five: Jurisdiction

All site preparation and construction activities as defined hereinafter occurring in the Conesus Lake Watershed ***and Hemlock Lake Watershed*** shall be in conformance with the provisions set forth herein.

Section Six: Definitions

Unless specifically defined below, words or phrases shall be interpreted so as to give them the meaning they have in common usage and to give this Law its most effective application. Words used in the singular shall include the plural and the plural the singular; words used in the present tense shall include the future tense. The word “shall” connotes mandatory and not discretionary; the word “may” is permissive.

Agricultural operations (as defined in Article 25-AA of the NYS Agriculture and Markets Law) – Land and on-farm buildings, equipment and practices which contribute to the production, preparation and marketing of crops, livestock and livestock products as a commercial enterprise.

Certificate of Compliance - A written certificate that is issued to the Applicant by the Code Enforcement Officer after all final grading and seeding are completed and all permanent erosion control measures are established as specified in the Erosion Control Permit and to the satisfaction of the Code Enforcement Officer.

Certified Professional - A licensed architect, a licensed engineer, a licensed landscape architect, or an International Erosion Control Association (IECA) Certified Professional in Erosion and Sediment Control.

Develop - To make a site or area available for use by physical alteration.

Development - Development shall mean any physical alteration of a site or are, including, but not limited to, providing access to a site, clearing of vegetation, grading, earth moving, providing utilities and other services such as parking facilities, stormwater management and erosion control systems, and sewage disposal systems, altering landforms, or construction of a structure on the land.

Erosion - The removal of soil particles by the action of the water, wind, ice or other geological agents.

Erosion Control Permit - A permit that is issued by the Code Enforcement Officer before any development and/or land clearing activities can occur on a site.

Erosion Control Plan - A document prepared by a certified professional that identifies pre-development and post-development conditions on a site and outlines the erosion control measures that will be used on a site. This document is required for projects exposing more than 10,000 square feet of soil.

Flood Plain - For a given flood event, that area of land temporarily covered by water which adjoins a watercourse.

Garden - A plot of ground where herbs, fruits, flowers, or vegetables are cultivated, excluding agricultural operations as defined herein.

Gabion - A galvanized wire basket filled with stone used for structural purposes. When they are fastened together, they are used as retaining walls, slope protection and similar structures.

Grading - Excavation or fill of material, including the resulting conditions thereof.

Natural Drainage Channel - A swale, watercourse in a gully, or an unprotected stream.

Performance Standards - The set of standards outlining the erosion control requirements for construction and soil-disturbing activities.

Perimeter Control - A barrier that prevents sediment from leaving a site either by filtering sediment-laden runoff, or diverting it to a sediment trap or basin.

Phasing - Clearing a parcel of land in distinct phases, with the stabilization of each phase occurring before the clearing of the next.

Rip-rap - A combination of large stone, cobbles and boulders used to line channels, stabilize stream banks, and reduce runoff velocities.

Stabilization - The use of practices that prevent exposed soil from eroding.

Stop Work Order - A written order issued by the Code Enforcement Officer to cease and desist all activity and development on a site until such time as the violation is corrected.

Stream Corridor - The landscape features on both sides of a stream, including soils, slope and vegetation, whose alteration can directly impact the stream's physical characteristics and biological properties.

Steep Slope - Grade change of 15% or more.

Swale - A natural or man-made depression or wide shallow ditch used to temporarily route or filter runoff.

Start of Construction - The first land-disturbing activity associated with a development, including land preparation such as clearing, grading and filling; installation of streets, driveways, parking areas and walkways; excavation for basements, footings, piers or foundations; erection of temporary forms; and installation of accessory buildings such as garages.

Utilities - public and private services, including, but not limited to, public water and sewer connection, private wells and septic systems, and telephone, natural gas, electric, and cable television services.

Watershed - A region or area bounded by a greater elevation and draining ultimately to a particular body of water.

Section Seven: Applicability

1. This Law shall apply to all development, as defined herein, which involves the uncovering, exposure or disturbance of 500 or more square feet of soil. Excepted herefrom are agricultural operations whether or not within an Agricultural District, as defined in Article 25-AA of the New York State Agricultural and Markets Law, and private gardens.

2. No person, corporation, entity, organization, or public agency shall initiate any development activities, land clearing, land grading, or earth moving activities (hereinafter also collectively referred to as "land disturbance activity") unless in conformity with the regulations of this law.
3. No person, agency, corporation or other entity shall commence any development or land disturbing activities without obtaining an Erosion control Permit issued by the **Town/Village** Code Enforcement Officer.
4. No person shall be granted an Erosion Control Permit for land-disturbing activity that would require the disturbance or uncovering of 10,000 or more square feet without the approval of an Erosion Control Plan by the **Town/Village** Planning Board.
5. Exemptions. The following activities are exempt from the Erosion Control Plan requirements but must comply with the Performance Standards listed in Section Eleven and have the applicable erosion control measures approved by the Code Enforcement Officer:
 - a. Development or land disturbing activities involving at least 500 square feet of soil, but less than 10,000 square feet of soil;
 - b. Development of one single-family residential structure or one duplex unit and accessory structures and utilities thereto;
 - c. The installation of a lawn for one single-family residential structure; and
 - d. The installation of a driveway for one single-family residential structure.
 - e. The installation of all septic systems which are subject to review, inspection and/or approval of the Livingston County Department of Health.

Section Eight: Procedure for an Erosion Control Permit and Certificate of Compliance

1. An Applicant shall submit an Erosion Control Permit application to the Code Enforcement Officer, who shall inform the Applicant within seven days if the application is incomplete.
2. The Code Enforcement Officer shall refer all complete Erosion Control Permit applications for lands within the Conesus Lake Watershed District to the Conesus Lake Watershed Inspector within seven days of receipt for review and comment.
 - a. The Watershed Inspector shall have 14 days to comment on the application and return those comments to the Code Enforcement Officer: and
 - b. The Code Enforcement Officer shall consider comments from the Watershed Inspector if the comments are received within this period of time.
3. If an Erosion Control Plan is not required, the Code Enforcement Officer shall review the application to determine whether the proposed erosion control measures comply with the Performance Standards outlined in Section Eleven of this Law and approve or deny the Erosion Control Permit based on that review. A pre-construction meeting with the Code Enforcement Officer, the Conesus Lake Watershed Inspector, and the applicant may be required prior to the issuance of an Erosion Control Permit.
4. If an Erosion Control Plan is not required, an Erosion Control Permit must be approved or denied within 60 days of receipt of a complete Erosion Control Application by the Code Enforcement Officer.
5. Issuance of an Erosion Control Permit does not authorize development of the site unless and until all other applicable permits or approvals, including a building permit, are issued pursuant to federal, state and local law.
6. Inspections. The applicant shall arrange with the Code Enforcement Officer for scheduling inspections of the site. The Code Enforcement Officer shall inspect the work and either approve it or notify the applicant in writing of any failure to comply with the requirements of the approved Erosion Control Plan and/or Erosion Control Permit. The Code Enforcement Officer and the Watershed Inspector may conduct inspections at reasonable times to ensure effective control of erosion and sedimentation during all phases of construction. The Code Enforcement Officer may have the **Town/Village** Engineer assist on site inspections. If the **Town/Village** Engineer is consulted for an inspection, the Applicant shall be responsible for the cost of such consultation, pursuant to **Town/Village** law.
7. A Certificate of Compliance shall be issued by the Code Enforcement Officer after all final grading and seeding are completed and all permanent erosion control measures are established as specified in the Erosion Control Permit and to the satisfaction of the Code Enforcement Officer.
8. A permanent Certificate of Occupancy shall not be issued until a Certificate of Compliance is issued for the satisfactory installation and/or completion of erosion control measures.

Section Nine: Contents of the Erosion Control Plan

1. Erosion Control Plans shall be prepared by a Certified Professional. Plans must contain the information set forth in this section to enable the **Town/Village** Planning Board to determine whether the Plan will prevent the development from adversely affecting the water quality of the surface water due to erosion. In making this determination, Plans shall be evaluated pursuant to the Performance Standards in Section 11 hereof, and must therefore contain sufficient information to permit such evaluation.
2. The Erosion Control Plan shall contain the name, address, and telephone number of the owner, contractor, and developer. In addition, the legal description of the property shall be provided, and its location with reference to such landmarks as major waterbodies, adjoining roads, railroads, subdivisions, or towns shall be clearly identified on a map.
3. The structure and content of the Erosion Control Plan shall be as follows:
 - a. Background Information
 - 1) Project description which shall include, but not be limited to, a sequence of construction of the development site, including stripping and clearing, rough grading, construction of utilities, infrastructure, and buildings, and final grading and landscaping. Sequencing shall identify the expected date on which clearing will begin, the estimated duration of exposure of cleared areas, and the sequence of clearing, installation of temporary erosion and sediment measures, and establishment of permanent vegetation.
 - 2) Existing (pre-development) conditions including, but not be limited to, an identification of soils, slopes, and existing vegetative cover and drainage conditions.
 - 3) Proposed future (development) conditions, including, but not be limited to, an identification of drainage conditions and changes in vegetative cover anticipated to result from proposed activity.
 - b. Erosion and Sediment Control
 - 1) Identification of temporary erosion and sediment control measures, including, but not to be limited to, seeding mixtures and rates, types of sod, method of seedbed preparation, expected seeding dates, and type and quantity of mulching for both temporary and permanent vegetative control measures.
 - 2) Identification of permanent erosion and sediment control measures
 - c. Implementation Schedule and Maintenance including, but not limited to, easements and estimates of the cost of maintenance.

Section Ten: Erosion Control Plan Review Process

1. The Applicant shall submit a complete Erosion Control Plan to the Code Enforcement Officer.
2. The Code Enforcement Officer shall inform the Applicant in writing within 14 days if the Erosion Control Plan is incomplete. The Erosion Control Plan shall automatically be deemed complete if the Code Enforcement Officer does not inform the Applicant within 14 days.
3. When the Erosion Control Plan is determined to be complete, the Code Enforcement Officer shall then schedule it for review at the next available **Town/Village** Planning Board meeting, to be held not later than 31 days after the Erosion Control Plan is determined to be complete.
4. All Erosion Control Plans for development in the Conesus Lake Watershed must be referred to the Conesus Lake Watershed Inspector for review and comment within five days of Code Enforcement Officer receipt of the Plan. Comments received from the Conesus Lake Watershed Inspector prior to the **Town/Village** Planning Board meeting will be considered by the Code Enforcement Officer and the **Town/Village** Planning Board.
5. The Applicant shall receive written notice of the time and place of the **Town/Village** Planning Board meeting where the Erosion Control Plan will be reviewed no less than five days prior to the **Town/Village** Planning Board meeting.
6. An Erosion Control Plan shall also be reviewed by the **Town/Village** Engineer or any other certified professional retained by the **Town/Village**. The Engineer or certified professional may then recommend approval or disapproval of the Plan to the **Town/Village** Planning Board prior to the scheduled Planning Board meeting where the Plan will be discussed. A recommendation for approval or disapproval of the Plan must be based on conformance to the Performance Standards listed in Section Eleven.
7. The **Town/Village** Planning Board shall have the authority to impose reasonable conditions to ensure that the objectives of this Law are met.

8. The **Town/Village** Planning Board shall approve or disapprove the Erosion Control Plan. Approval or disapproval of the Plan must be based on conformance to the Performance Standards listed in Section Eleven, so as to protect the water quality of Conesus Lake, and should clearly identify why it does not, in the instance of a disapproval, conform to the Performance Standards.
9. The **Town/Village** Planning Board shall report the decision to the Code Enforcement Officer and the Applicant within 10 days of approval or disapproval of the Plan.
10. If the Erosion Control Plan is approved, the Code Enforcement Officer shall issue the Applicant an Erosion Control Permit within 10 days of receipt of the **Town/Village** Planning Board decision.

Section Eleven: Performance Standards

The following Performance Standards must be applied to all land-disturbing activities described in this law, including those exempted under section 5 hereof, as well as those for which a permit is required hereunder:

1. Existing vegetation on a project site shall be retained and protected as much as possible to minimize soil loss from the project site.
2. Sediment control practices/measures shall be designed to protect the natural character of waterbodies on-site as well as off-site. The practices must be in place before the start of land disturbance activities until the establishment of permanent stabilization.
 - a. The off-site impacts of erosion and sedimentation from the development site shall not be any greater during and following land disturbance activities than under pre-development conditions.
 - b. Water in stream reaches on-site and downstream of construction areas shall not have substantial visible contrast relative to color, taste, odor, turbidity and sediment deposition from the water in reaches upstream of the construction area.
 - c. Sediment laden runoff shall not be allowed to enter any waterbody and result in deposition on the bottom of the waterbody, degrade its natural biological functions, or be deleterious to the classified usage of the water.
3. All erosion and sediment control measures shall be constructed prior to beginning any land disturbance activities. All runoff from disturbed areas shall be directed to sediment control devices. These devices shall not be removed until the disturbed land areas are stabilized.
4. Specific guidance.
 - a. Exposure Restrictions: No more than 10 acres of unprotected soil shall be exposed at any one time. Previous earthwork shall be stabilized in accord with approved design standards and specifications referenced in Section 4.h before additional area is exposed.
 - b. Grading: Perimeter grading shall blend with adjoining properties.
 - c. Vegetative Protection: Where protection of trees and/or other vegetation is required, the location shall be shown on the Erosion Control Plan or on the drawings for the proposed development project. The method of protecting vegetation during construction shall conform to the design specifications referenced in Section 4.h.
 - d. Drainage Control.
 - 1) Surface runoff that is relatively clean and sediment free shall be diverted or otherwise prevented from flowing through areas of construction activity on the project site. (This will greatly reduce sediment loading in surface runoff.)
 - 2) A fill associated with an approved temporary sediment control structure or permanent stormwater management structure, shall not be created which causes water to pond off-site on adjacent property, without first having obtained ownership or permanent easement for such use from the owner of the off-site or adjacent property.
 - 3) Natural drainage channels shall not be altered. Pursuant to Article 15 of the Environmental Conservation Law, a protected stream and banks thereof shall not be altered or relocated without the approval of the Department of Environmental Conservation.
 - 4) Runoff from any land disturbing activity shall not be discharged or have the potential to be discharged off-site or into storm drains or into water courses unless such discharge is directed through a properly designed, installed and maintained structure, such as a sediment trap, to retain sediment on-site. Accumulated sediment shall be removed when it takes up 60% of the storage capacity of the sediment retention structure. (See

Section 4.h below for design specifications.)

- 5) For finished grading, adequate gradients shall be provided so as to prevent water from standing on the surface of lawns for more than 24 hours after the end of a rainfall, except in a swale flow area which may drain as long as 48 hours after the end of rainfall.
 - 6) Permanent swales or other points of concentrated water flow shall be stabilized. Biotechnical approaches using certain types of grasses, such as reed canary grass, are preferable to using sod, gabions and rip-rap where water quality enhancement is a high priority and the swale design allows. However, sod, gabions, or rip-rap may be used to stabilize swales where soils and gradient preclude the use of grasses. Use of grasses may require an erosion control matting as provided for in the design specifications referenced in Section 4.h below.
 - 7) Surface lows over cut and fill slopes shall be controlled as provided for in the design specifications for vegetating waterways referenced in Section 4.h.
- e. Timing.
- 1) Except as noted below, all sites shall be seeded and mulched with erosion control materials such as rye grass, straw mulch, jute, or excelsior (wood shavings) within 15 days of initial disturbance. If construction has been suspended, or sections completed, areas shall be seeded immediately and stabilized with erosion control materials. Maintenance shall be performed as necessary to ensure continued stabilization.
 - 2) For active construction areas, such as borrow or stockpile areas, roadway improvements, and areas within 50 feet of a building under construction, a perimeter sediment control system consisting, for example, of silt fencing or hay bales, shall be installed and maintained to contain soil.
 - 3) On cut sides of roads, ditches shall be stabilized immediately with rock rip-rap or other non-erodible liners, or where appropriate, vegetative measures such as sod. When seeding is approved, an anchor mulch shall be used and soil shall be limed and fertilized in accord with recommendations referenced in Section 4.h.
 - 4) Permanent seeding shall optimally be undertaken in the spring from April 1 through June 15, and in late summer from August 1 to October 15. During the peak summer months and in the fall after October 15 when seeding is found to be impracticable, an appropriate mulch shall be applied. Permanent seeding may be undertaken during summer if plans provide for adequate watering of the seedbed.
 - 5) All slopes steeper than 15%, as well as basin or trap embankments, and perimeter dikes shall, upon completion, be stabilized with sod, seed and anchored straw mulch, or other approved stabilization measures. Areas outside of the perimeter sediment control system shall not be disturbed. Maintenance shall be performed as necessary to ensure continued stabilization.
 - 6) Temporary sediment trapping devices shall be removed within thirty (30) calendar days following establishment of permanent stabilization in all contributory drainage areas. Stormwater management structures used temporarily for sediment control shall be made permanent within this time period as well. Accumulated sediments removed from temporary sediment traps or permanent stormwater management facilities shall be disposed in a manner so as not to erode and enter a water body.
- f. Stream Corridor Management. The bed and banks of all on-site and off-site streams which may be impacted by land clearing, grading, and construction activities shall be protected to prevent sedimentation, stream bank erosion, stream enlargement, or degradation or loss of fisheries habitat. Measures for protecting the bed and/or banks of a stream may include gabion baskets, rip-rap, log cribbing, and vegetative measures. Whenever possible, vegetative stream bank stabilization practices are recommended over structural practices such as rip-rap and gabion linings that may unnecessarily alter the existing stream ecosystem. Native species of vegetation shall be used for stream bank stabilization wherever practical. In undertaking stream bank stabilization activities for protected streams, the Applicant shall comply with appropriate protection of water provisions in Article 15 of the Environmental Conservation Law of the State of New York.
- g. Maintenance
- 1) All points of construction ingress and egress shall be protected to prevent the deposition of materials onto traversed public thoroughfares either by installing and maintaining a stabilized construction entrance or by maintaining a vehicle wash area in a safe disposal area to wash vehicle shells and undercarriage. All materials deposited onto public thoroughfares shall be removed immediately. Proper precaution shall be taken to assure that the removal of materials deposited onto public thoroughfares will not enter catch basins, storm sewers, or water bodies.

- 2) Accumulated sediment shall be removed when 60% of the storage capacity of sediment retention structures is reached. All removed sediment shall be disposed of in a spoil area where it can be graded, mulched and seeded to prevent erosion and sedimentation.
- h. Design specifications. The designs, standards and specifications for controlling erosion and sedimentation found in the most recent version of the following publication are acceptable for use and shall be identified and shown in the Erosion Control Plan: "New York Guidelines for Urban Erosion and Sediment Control," Urban Soil Erosion and Sediment Control Committee.

Section Twelve: Performance Bond

1. In order to ensure the full and faithful completion of all construction activities related to compliance with all conditions set forth by the **Town/Village** Planning Board in its approval of the Erosion Control Plan, the **Town/Village** Planning Board may require the applicant and/or the applicant's contractor to provide, prior to construction, a performance bond, escrow account certification, or irrevocable letter of credit from an appropriate financial or surety institution which guarantees satisfactory completion of the project and names the **Town/Village** as the beneficiary. The security shall be in an amount to be determined by the **Town/Village** Planning Board based on submission of final design plans, with reference to actual construction costs.
2. Where erosion and sediment control facilities are to be operated and maintained by the applicant or by any person or entity that owns or manages a commercial or industrial facility, the applicant, prior to construction, may be required to provide the **Town/Village** with a performance bond or an irrevocable letter of credit from an appropriate financial institution or noted surety to ensure proper operation and maintenance of all erosion control facilities for the life of the project.
3. The performance bond or letter of credit shall remain in force until the surety is released from liability by the **Town/Village**.
4. Per annum interest on the performance bond or letter of credit shall be reinvested in the account until the surety is released from liability.
5. If the developer or owner fails to properly operate and maintain erosion and sediment control facilities, the **Town/Village** may draw upon the account or notify the surety to cover the costs of proper operation and maintenance.

Section Thirteen: Enforcement

1. Any development activity that is commenced without first being granted an Erosion Control Permit, or which is conducted contrary to an approved Erosion Control Plan, or contrary to the Performance Standards listed in Section Eleven hereof may be issued a Notice of Violation and restrained by a Stop Work Order issued by the Code Enforcement Officer.
2. Service of a Notice of Violation shall be sufficient if directed to the owner, agent of the owner or contractor and left at their last known place of business or residence, if within the municipality; and if no place of business or residence can be found, then the notice shall be served by posting in a conspicuous place on the premises which are the subject of the violation.
3. A Stop Work Order shall also be issued on the project if any of the following conditions are not met during development of the land:
 - a. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;
 - b. There shall be no suspended, colloidal and settleable solids that will cause deposition or impair waters in the area for their best usages; and
 - c. There shall be no residue from oil and floating substances, visible oil film, globules, or grease. (6NYCRR, Part 703, Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations).
4. Civil and Criminal Penalties. In addition to or as an alternative to any penalty provided herein or by law, any person who violates the provisions of this Law shall be punished by a fine of not less than Two Hundred Dollars (\$200) per day nor more than One Thousand Dollars (\$1,000) per day or by imprisonment for a period not to exceed sixty (60) days, or by both such fine and imprisonment. Such person shall be guilty of a separate offense for each day during which the violation occurs or continues.
5. Any violator may be required to restore land to its undisturbed condition. In the event that restoration is not undertaken within a reasonable time after notice, the **Town/Village** may take necessary corrective action, the cost of which shall become a lien upon the property until paid.

Section Fourteen: Appeals

Any person aggrieved by the action of any official charged with the enforcement of this Law, as the result of the disapproval or approval of an Erosion Control Permit or an alleged failure by the Code Enforcement Officer to properly enforce the Law in regard to a specific application, shall have the right to appeal the action to the **Town/Village** Zoning Board of Appeals. The appeal shall be filed in writing within twenty (20) days of the date of official transmittal of the final decision or determination to the Applicant, shall state clearly the grounds on which the appeal is based, and shall be processed in the manner prescribed for hearing administrative appeals under (*state/local code prevision*).

Section Fifteen: Severability

Each separate provision of this Law is deemed independent of all other provisions herein so that if any provision or provisions of this Law is declared invalid, all other provisions thereof shall remain valid and enforceable.

Section Sixteen: Variance

The **Town/Village** Zoning Board of Appeals may grant a written variance from any requirement of this Law using the following criteria:

1. There are special circumstances applicable to the subject property or its intended use; and
2. The granting of the variance shall not result in:
 - a. An increase or decrease in the rate or volume of surface water run-off;
 - b. An adverse impact on a wetland, water course or water body;
 - c. Degradation of water quality; or
 - d. Otherwise impair attainment of the objectives of this Law.

Section Seventeen: Effective Date

This Law shall become effective on _____.

(Endorsed by the CLWMP Policy Committee on August 16, 2001.)

Note: This Model Law was based, in part, on a NYSDEC Model Law found in "Reducing the Impacts of Stormwater Runoff from New Development" (1992). After the development of this CLWMP model law, the State of New York adopted the Phase II permitting process and made changes to previous guidelines (the NYSDEC Model Law) in order to be compliant with the Federal Clean Water Act. Minor adjustments to this CLWMP Model Erosion and Sediment Control Law would be needed in order to bring this Model Law into full conformance with the revised State regulations.

APPENDIX 5: SUMMARY OF ROAD DITCH AND STREAM BANK SURVEYS

EcoLogic Memorandum

TO: Planning Committee, Conesus Lake Watershed Management Plan
FROM: Ana Fernandez
RE: Summary of road ditch surveys and assessment, Conesus Lake watershed
DATE: December 4, 2001

One of the technical issues identified in the Conesus Lake Watershed Characterization effort was the potential for eroding road ditches to be a source of sediment to the tributaries to Conesus Lake (both permanent and intermittent) and ultimately to Conesus Lake itself. Watershed residents raised this issue during the project scoping session in June 1999 as well as during the public presentations of the draft State of Conesus Lake and Watershed (the Characterization report). New York Dept of State includes roadbank inventories as part of their technical requirements for the watershed plans.

To date, the watershed planning team has completed two inventories of the condition of road banks in the watershed. The first road ditch erosion survey was completed in May 2001 using volunteers trained by the Livingston County Planning and Health Departments. The trained volunteers covered the entire watershed and assigned a relative rank to each of the road ditches. Condition was noted as:

- Good
- Moderate/Repair needed
- Poor/Lacking sedimentation control structures

Data from this survey were tabulated and mapped. Livingston County Planning Department staff incorporated results of the survey into the draft watershed characterization report.

A follow-up survey was completed in August 2001 by EcoLogic staff. The objective of the second survey was to quantify the potential sediment loss from the sites. The data could then be used to determine priority areas in need of restoration based on their potential for contributing sediment to Conesus Lake.

The second survey was designed using the results of the visual survey as a basis for stratifying the sites. Twenty percent (20%) of the sites in each of the three categories were selected at random for inclusion in the follow-up survey.

The follow-up survey included measurements of ditch width, depth, and bank slope. The EcoLogic field team also noted visible signs of erosion, drainage pattern, kind and amount of vegetation, adjacent land use, eroded distance, etc. The results from this survey were used to calculate approximate amount of soil displaced per mile per year.

Results indicate that the range of potential channel erosion of road ditches in the Conesus Lake watershed was 7.9 – 101 tons/year/mile. Median was 16.9, average 21.6 tons/year/mile. Using the spread between the 1st and 3rd quartiles (13.8 – 25.3 tons/yr/mi) as indicative of moderate erosion, we found that 18 sites out of 74 (24%) classify as High erosion sites. Six (6) of these sites are located within the Inlet, 2 in the No Name and S. McMillan watersheds, and 1 each in the Wilkins, NE Creeks, Central, SW Creeks, Cottonwood, Hanna's, N. McMillan, and S. Gully watersheds.

Only 4 sites (2 in the Inlet, 1 in Wilkins and 1 in S. McMillan) had potential erosion rates greater than 50 tons/yr/mi. Six (6) sites had erosion potentials between 30 and 50 tons/yr/mi (1 each in the NE Creeks, SW Creeks, Inlet, Cottonwood, Hanna's, and S. McMillan watersheds).

Tables 1 and 2 rank all subwatersheds based on their median and average erosion potential, respectively.

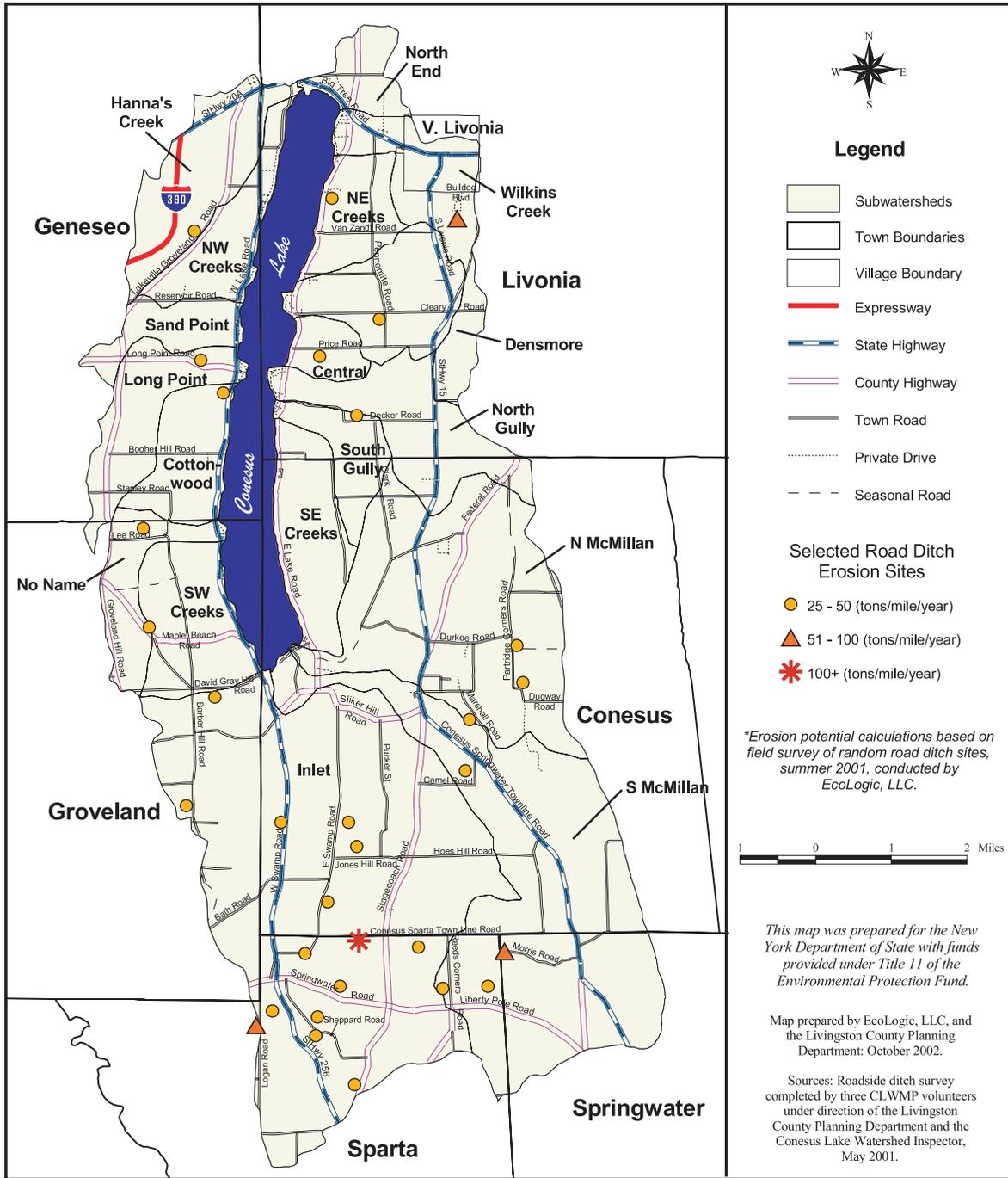
Table 1. Road ditch erosion potential ordered by median results.

Subwatershed	No. of sites	Road Ditch Channel Erosion (tons/yr/mi)			
		min	median	average	max
NW Creeks	2	10.4	12.2	12.2	14.1
Densmore	3	9.1	12.3	13.8	19.8
NE Creeks	3	9.5	13.0	19.8	36.9
Wilkins	4	12.8	13.4	22.9	52.1
Cottonwood	4	9.3	14.8	18.7	36.0
South McMillan	13	10.5	15.0	19.5	51.6
Sand Point	4	12.4	15.5	15.0	16.9
Hanna's	3	15.3	16.3	26.7	48.3
North McMillan	4	13.8	16.9	18.5	26.3
North Gully	2	17.7	18.0	18.0	18.3
Inlet	19	7.9	18.3	27.0	101.0
Central	2	13.9	19.9	19.9	25.9
SW Creeks	3	18.7	22.0	26.3	38.0
Long Point	2	20.7	23.0	23.0	25.3
No Name	4	18.4	24.3	23.5	26.8
South Gully	1	26.6	26.6	26.6	26.6
TOTAL	74	7.9	16.9	21.6	101.0

Table 2. Road ditch erosion potential ordered by average results.

Subwatershed	No. of sites	Road Ditch Channel Erosion (tons/yr/mi)			
		min	median	average	max
NW Creeks	2	10.4	12.2	12.2	14.1
Densmore	3	9.1	12.3	13.8	19.8
Sand Point	4	12.4	15.5	15.0	16.9
North Gully	2	17.7	18.0	18.0	18.3
North McMillan	4	13.8	16.9	18.5	26.3
Cottonwood	4	9.3	14.8	18.7	36.0
South McMillan	13	10.5	15.0	19.5	51.6
NE Creeks	3	9.5	13.0	19.8	36.9
Central	2	13.9	19.9	19.9	25.9
Wilkins	4	12.8	13.4	22.9	52.1
Long Point	2	20.7	23.0	23.0	25.3
No Name	4	18.4	24.3	23.5	26.8
SW Creeks	3	18.7	22.0	26.3	38.0
South Gully	1	26.6	26.6	26.6	26.6
Hanna's	3	15.3	16.3	26.7	48.3
Inlet	19	7.9	18.3	27.0	101.0
TOTAL	74	7.9	16.9	21.6	101.0

Map 5-1 Conesus Lake Watershed Road Ditch Erosion Potential



Discussion

Overall, the condition of road ditches in the Conesus Lake watershed is good. Ditches with the highest potential erosion rates were those that were not vegetated, on very steep slopes with road constructed over coarse fill material, and those with very high, steep banks.

Ranking subwatersheds (Table 2) by the average road ditch erosion potential tends to skew the ranking where one or two sites have very high numbers. The rank based on median road ditch erosion potential is less likely to be biased. However, specific sites with very high potential erosion should be targeted for remedial measures regardless of their subwatershed rank.

Recommendations

The practice of re-seeding ditches should be extended over the entire Conesus Lake watershed. In addition, sites with severely undercut banks should have those banks re-graded to avoid collapse. These sites might then require some type of reinforcement at the base to avoid future undercutting.

EcoLogic Memorandum

TO: Planning Committee, Conesus Lake Watershed Management Plan

FROM: Ana Fernandez

RE: Summary of streambank surveys and assessment, Conesus Lake watershed

DATE: December 18, 2001

One of the technical issues identified in the Conesus Lake Watershed Characterization effort was the potential for eroding streambanks to be a source of sediment in the tributaries of Conesus Lake (both permanent and intermittent) and ultimately to Conesus Lake itself. Watershed residents raised this issue during the project scoping session in June 1999 as well as during the public presentations of the draft State of Conesus Lake and Watershed (the Characterization report). New York Dept of State includes streambank inventories as part of their technical requirements for the watershed plans.

To date, the watershed planning team has completed two inventories of the condition of streambanks in the watershed. The Conesus Lake Watershed Inspector performed the first stream/rivulet erosion survey in late May, 2001. This first survey attempted to locate and classify all the streams/rivulets in the Conesus Lake watershed.

The second survey was done in three separate stages, starting in mid-Oct. and ending in mid-November. A 20% random sample was chosen from each of the categories from the previous survey:

No Erosion: Grass on both sides of the bank and no visible erosion.

Slight: Small areas of bare earth, but slight slope and no signs of erosion.

Moderate: Bare ground visible with moderate slopes.

Severe: Undercutting of roots and banks visible on moderate slopes.

Very severe: Bare ground with slopes exceeding 45% and evidence of erosion visible in the water.

Not surveyed.

Because most of the streams/rivulets lie within private property, the Livingston County Planning Department made an intensive effort to contact all property owners bordering the chosen sites to obtain their permission for access. In addition, the field team notified owners, if present, before entering any private property.

The team took measurements of stream width, depth, and bank slope. Notes were taken as to visible signs of erosion, drainage pattern, kind and amount of vegetation, adjacent land use, eroded distance, etc. The results from this survey were used to rank subwatersheds according to their erosion potential.

Results

Of the original 90 sites, 2 were denied access and 18 got no response from the owners; therefore, the erosion potential for these sites could not be calculated.

The range for potential channel erosion of streams/rivulets in the Conesus Lake watershed was 8.0 – 209.3 tons/year/mile (Table 1). Median was 39.5, average 46.5 tons/year/mile. Using the spread between the 1st and 3rd quartiles (19.2 – 58.4 tons/yr/mi) as indicative of moderate erosion, we found that 17 sites out of 72 (24%) classify as High erosion sites. Six (6) of these sites are located within the N McMillan watershed, 3 in S McMillan, 2 in N Gully, and 1 each in Wilkins, SW Creeks, Inlet, No Name, S Gully, and NW Creeks.

Table 1. Stream segments surveyed ordered by their calculated potential erosion rate.

tons/yr/mi	Stream segment*	tons/yr/mi	Stream segment*
8.0	C13	42.3	N75
8.1	G103	42.5	G72
9.3	B22	42.8	N10
9.5	B33	44.9	H3
9.6	N12	45.4	G30
10.5	B23	45.9	G95
11.4	B32	47.0	G57
11.9	O15 Rivulet	48.9	R1
12.5	N4	50.3	G79
12.7	G53	52.3	F9
13.6	F12 Rivulet	52.6	M8
15.6	D14	55.9	G83
15.7	S26	58.4	S1Rivulet
16.4	N9	59.2	N60
17.5	B18	60.0	N67
18.0	G7	62.4	G23
18.6	S21	63.2	Q8
19.2	N34	72.6	N66
19.4	O16 Rivulet	73.1	N80
20.0	E5	77.9	F4 Rivulet
20.2	N59	81.3	P8
20.5	D11	81.6	R12
20.5	S39	82.4	N68
22.1	G97	89.4	N62
23.3	D19	98.8	L6
23.4	B11	102.7	S1
24.8	N31	138.8	Q19
26.3	G38	151.3	B15
27.2	O8 Rivulet	201.9	S34
33.4	F8 Rivulet	209.3	S5
34.4	S22	no channel	C14
34.6	G122		
37.8	J1Rivulet		
39.2	S6 Rivulet	min	8.0
39.5	S3	median	39.5
40.0	S8	average	46.5
41.0	N3	max	209.3
41.3	F9 Rivulet		
42.2	J5 Rivulet	1st q	19.2
42.3	G63	3rd q	58.4

*Letter designation refers to subwatershed; number was arbitrarily assigned within each subwatershed.

Only 3 sites (2 in S McMillan and 1 in Wilkins) had potential erosion rates greater than 150 tons/yr/mi. Two (2) sites had erosion potentials between 100 and 150 tons/yr/mi (1 in S McMillan, 1 in N Gully).

Table 2 ranks all subwatersheds based their corrected stream factor. Stream factors were calculated for each site using the formula below. Watersheds were assigned an average stream factor by averaging the results of all the sites in that watershed. No sites were available in the North End and Long Point watersheds; therefore, their rank was calculated by averaging the stream factor for sites with similar soil characteristics in other sub-watersheds. Stream factors for each watershed were corrected for watershed size before ranking.

Stream Factor Equation = [bottom material + bank vegetation + bank condition] + (average velocity) * (miles of stream channel in the watershed)

Bottom material: soil, gravel, rock

Bank vegetation: no vegetation (35-0% cover), sparse (35-65% cover), heavy (> 65% cover)

Bank condition: no erosion, mild, severe

Manning's equation: $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ = average velocity

r = hydraulic radius (calculated using different formulas based on channel shape, width, depth and bank slope)

s = stream slope (gradient)

n = basic roughness coefficient (based on bottom material, vegetation, meanders, etc.)

Discussion

Overall, the streams in the Conesus Lake watershed exhibit moderate to high erosion. The main reasons for this are the topography of the watershed and the soil characteristics.

Most of the streams and rivulets in the Conesus Lake watershed are not permanent; they flow only during periods of heavy rains or snowmelt. For this reason, much of the sediment transported in those streams/rivulets could be the result of adjacent land use, not just channel erosion. Therefore, it is important to consider adjacent land uses when targeting sediment transport of streams/rivulets in the Conesus Lake watershed.

The majority of the rivulets are concentrated in very steep areas around the lake. For the most part, the land immediately adjacent is either undisturbed or with heavy vegetation next to and covering the rivulet banks. But there are areas where the land has been disturbed. When this happens, especially at the head of a rivulet, the sediment load is greatly increased because of the runoff transport and the abrasive action of sediment-laden water in a confined channel. Most heavy erosion will occur at the bottom of a stream/ rivulet due to the cumulative action of water and sediment.

The site with the heaviest calculated erosion potential was at the mouth of the Inlet. This seems counter-intuitive given the flatness of the land in this area. However, all the signs of heavy erosion (undercut banks, exposed roots) were observed during the field survey. The formula used to calculate erosion potential is very sensitive to width and depth of the channel. Because the Inlet is fairly wide and deep in this area, the results are not unexpected. The other two sites with erosion potentials over 150 tons/year/ mile also exhibited extensive areas of undercut banks and exposed roots.

Recommendations

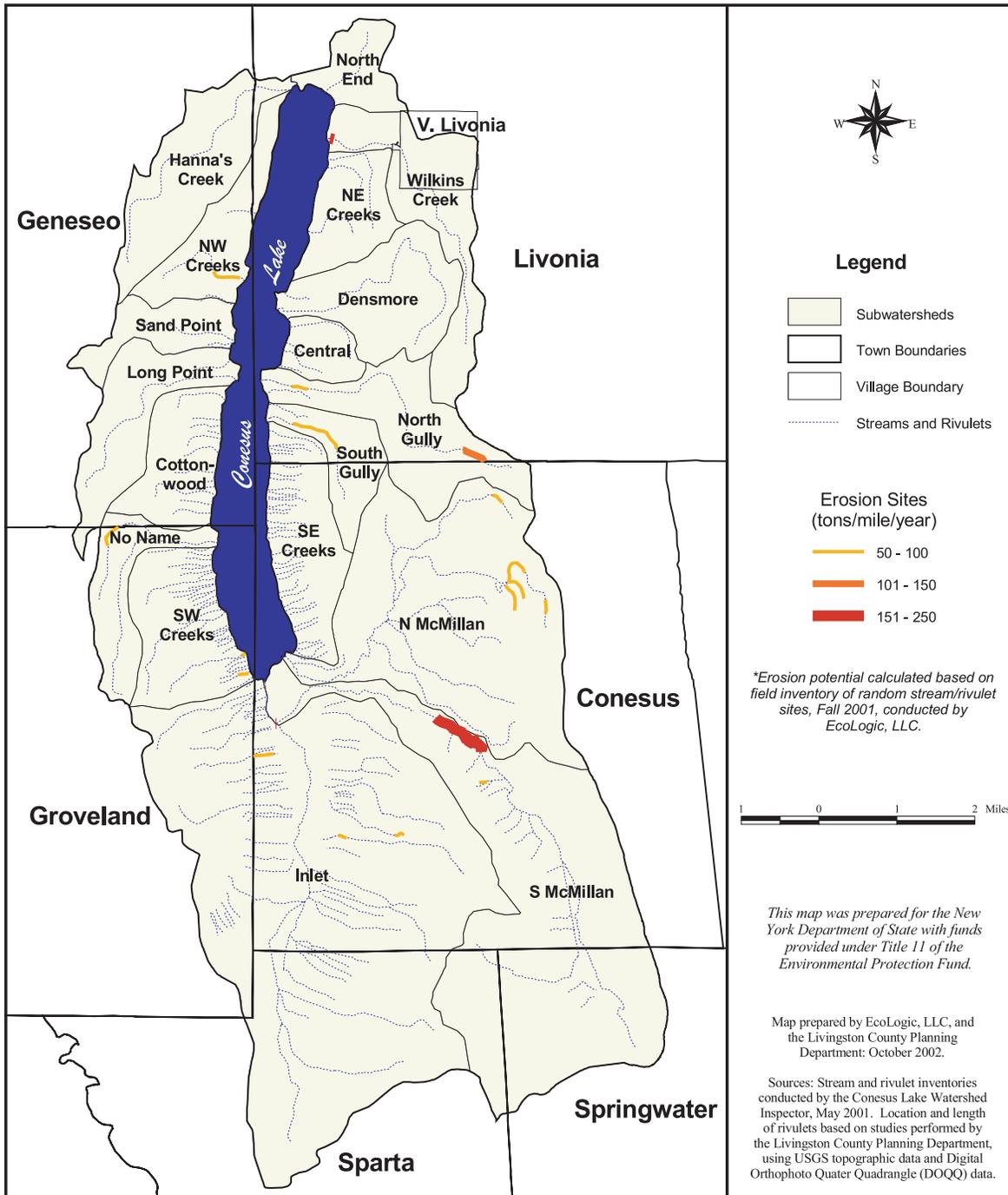
Much of the erosion in the Conesus Lake watershed is natural given the steep topography and coarse soils. In areas of undisturbed land, buffers should be created and explicitly maintained as such. In areas where land use creates soil disturbances (development, agriculture, etc.) care should be taken to establish erosion control measures such as silt fences and grassed waterways, and to implement agricultural Best Management Practices, including the establishment of riparian buffers wherever possible.

Table 2. Streambank erosion potential by subwatershed.

Adjusted Stream Factor	Watershed
4.1	Sand Point
5.4	NE Creeks
9.6	Inlet
15.1	Hanna's
22.1	N Gully
25.6	Wilkins
27.3	South McMillan
28.3	Densmore
31.6	Cottonwood
31.7	SW Creeks
34.3*	Long Point
37.9	SE Creeks
41.0*	North End
41.8	NW Creeks
49.9	No Name
51.2	S Gully
86.9	Central
95.6	North McMillan

* average of sites with similar soil characteristics in other sub-watersheds.

**Map 5-2
Conesus Lake Watershed Stream and Rivulet Erosion Potential**



APPENDIX 6: COMPARISON OF LOCAL LAND USE ORDINANCES IN WATERSHED MUNICIPALITIES

The *State of Conesus Lake: Watershed Characterization Report* has identified erosion and sedimentation as significant contributors of nutrients to Conesus Lake. The influx of nutrients into the Lake has been linked to the proliferation of undesirable conditions such as increased weed growth and algae blooms. Erosion and stormwater runoff in the Conesus Lake watershed are two of the largest contributors of nonpoint source pollution to Conesus Lake.

One of the goals of the Conesus Lake Watershed Management Plan will be the reduction of erosion and nonpoint source pollution in the watershed. The mitigation measures that will help to achieve this goal can be either structural (i.e. construction of regional stormwater management facilities) or regulatory (i.e. adoption of new laws or amendments to existing laws). The focus of this report is on the land use regulations that currently exist in the watershed and how they relate to and address nonpoint source pollution.

One of the most influential tools available to local governments is the power to regulate the physical development at the local level. Through control of land use, each community is able to develop and display the most desirable physical characteristics and to protect the public health and welfare and environmental quality of the community. Municipal land use regulations play an important role in the control and reduction of nonpoint source pollution by regulating factors such as impervious cover, drainage and stormwater facilities, and development on sensitive environmental areas. A map of the zoning districts in the watershed is on page 93.

A comparison of land use regulations in the Conesus Lake watershed municipalities (Towns of Conesus, Geneseo, Groveland, Livonia, Sparta, Springwater and the Village of Livonia) begins on page 94. The categories of comparison for the local land use regulations include:

- 1) Erosion & Sediment Control
 - a) Riparian buffers and wetlands
 - b) Vegetation retention & enhancement
 - c) Open land and parks
 - d) Setbacks
 - e) Steep slope restrictions
 - f) Grading and excavation
- 2) Drainage & Stormwater Management
 - a) Drainage & stormwater management facilities & easements
 - b) Impervious surfaces
 - c) Flood management
- 3) Ground- and Drinking Water/Sewage
 - a) Private water systems (wells)
 - b) On-site sewage systems (septic)
- 4) Other
 - a) Cluster developments

Most development in Livingston County consists of many individual projects built over decades. Development alters the surface of the land by replacing natural cover with roof tops, roads, parking lots, driveways and sidewalks. These surfaces are impermeable to rainfall and are collectively known as impervious cover. According to the Center for Watershed Protection, recent watershed research has shown that impervious cover can have a negative impact on the quality of aquatic resources. The influence of impervious cover on aquatic systems presents a challenge to communities with the dual interests of promoting growth and protecting the local environment.

Municipalities can regulate impervious cover by limiting the amount of lot surface that can be covered over by impermeable materials such as buildings and structures. This is most often accomplished through maximum lot coverage limits in zoning regulations. Shoreline areas and near-shore areas are especially sensitive to the amount of impervious cover allowed because of their proximity to Conesus Lake. Lots with excessive impervious cover will promote direct runoff into the lake, instead of allowing the water to percolate and filter into the soil. Small lots on the shoreline and in the near shore area can aggravate the situation with high housing densities and the presence of impervious infrastructure (roads). The following table examines the minimum lot size and maximum lot coverage requirements of the shoreline and near-shore areas:

Municipal Zoning of Shoreline and Near-Shore Properties Comparison of Minimum Lot Size and Maximum Lot Coverage Requirements

Zoning District	Minimum Lot Size Requirement	Maximum Lot Coverage
Town of Livonia		
Waterfront Development (WD)	Determined through site plan review process	minimum 30% green space maximum 40% lot coverage
Neighborhood Residential (NR)	Min. area for residential uses varies depending upon availability of public water and sewer. Single-family lot sizes range from min of 15,000 - 40,000 square feet. Two-family minimum lot sizes range from 20,000 to 80,000 square feet. Min. lot size for multi-family and mixed residential developments are guided by the multi-family density standard of 8 DU/Acre.	25%
Town of Conesus		
Lake Residential-1 (LR1)	single family = 5,000 sq.ft.; two family = 7,500 sq.ft.	50%
Lake Residential-2 (LR2)	single family = 3,000 sq.ft.; two family = 5,000 sq.ft.	50%
Town of Geneseo		
Lake Neighborhood Business Zoning District (LNB)	1 acre	35%
Lake Shore Zoning District (L)	6,000 sq.ft.	35%
Town of Groveland		
Lake Shore Residential (LSR)	6,000 sq.ft.	35%

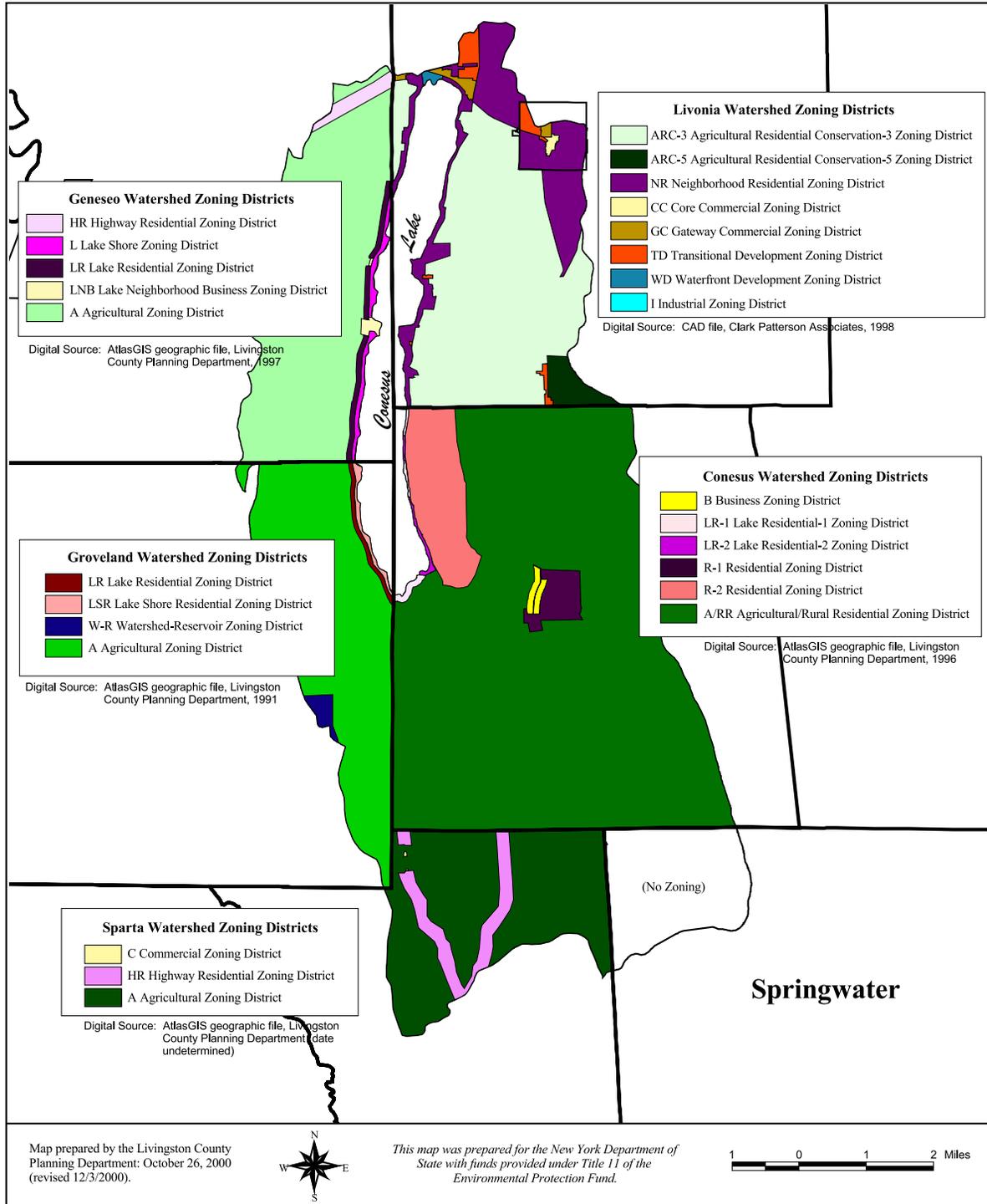
Maximum lot coverage requirements range from 25% for residential uses in the Town of Livonia to 50% for residential uses in the Town of Conesus. Because impervious cover can contribute direct runoff into the lake from these shoreline and near-shore areas, maximum lot coverage requirements should be more restrictive in these zones. There are also zoning districts in the watershed that do not specify maximum lot coverage requirements. All zoning districts in the watershed should adopt maximum lot coverage limits to control the amount of impervious surface.

Some municipalities in the watershed have sections in the zoning regulations that require the developer and municipal boards to consider development impact on erosion and sedimentation through local regulatory stormwater and erosion control, regulatory management of steep slopes and structural measures, regulatory management of impervious surfaces, regulatory management of wetlands and riparian corridors, and regulatory management of open space (as an effective means to filter surface water before it reaches the groundwater level). The Town and Village of Livonia have the most comprehensive zoning regulations in the watershed with regards to defining sensitive environmental areas (land conservation areas), creating overlay districts, and providing specific regulations for those areas. The Towns of Conesus and Sparta also have areas that have additional regulations for steep slope areas. A complete comparison begins on page 6-4 below.

The Conesus Lake Watershed Management Plan Policy Committee endorsed a Model Erosion and Sediment Control Law, which addresses issues such as grading and excavation, vegetative coverage and retention, stream corridor buffering and steep slope development. As a recommendation, the watershed municipalities should adopt an Erosion and Sediment Control Law or incorporate the erosion control measures into their existing zoning laws.

The Towns of Geneseo, Livonia and Sparta allow cluster developments in their residential zoning districts. The Town of Livonia also provides illustrated examples of sample cluster development layouts in their zoning code. Cluster developments are most often residential developments, and they allow for houses to be “clustered” on smaller lots on a portion of the property while offering the remainder of the lot for open space. The ultimate benefit of a cluster development is the overall reduction in impervious cover on a parcel and the preservation of open space. These developments should be encouraged in the Conesus Lake watershed with strong requirements for stormwater management.

Conesus Lake Watershed Zoning Districts



Zoning Laws & Ordinances

Town of Conesus	
Issue	Zoning Ordinance Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	
vegetation retention & enhancement	R-2 district: Minimize removal of vegetative cover.
open land and parks	
setbacks	<p>Lakeshore & Adjacent Upland Zoning Districts</p> <ul style="list-style-type: none"> • <u>Lake Residential-1 (LR-1)</u>: Front = 25 feet; Rear = above high water elevation; Side = 5 feet Minimum lot width = 45 feet (1-family) or 60 feet (2-family) Minimum lot size = 5,000 sq. feet (1-family) or 7,500 sq. feet (2-family) • <u>Lake Residential-2 (LR-2)</u>: Front = 10 feet; Rear = above high water elevation; Side = 5 feet Minimum lot width = 40 feet Minimum lot size = 3,000 sq. feet (1-family) or 5,000 sq. feet (2-family) • <u>Residential-2 (R-2)</u>: Front = 30 feet; Rear = 50 feet; Side = 10 feet Minimum lot width = 150 feet; Minimum lot depth = 150 feet Minimum lot size = 2 acres
	<p>Zoning Districts Beyond the Shoreline Areas</p> <ul style="list-style-type: none"> • <u>Residential - Expanded Hamlet (R-1)</u>: Front = 30 feet; Rear = 50 feet; Side = 10 feet Minimum lot width = 80 feet; Minimum lot size = 12,000 sq. feet • <u>Business (B)</u>: Front = 10 feet; no rear setback; Side = 5 feet No minimum lot width; No minimum lot area • <u>Agricultural (A)</u>: Front = 30 feet; Rear = 50 feet; Side = 10 feet Minimum lot width = 150; Minimum lot area = 2 acres
steep slope restrictions	<p>R-2 district requirements in steep slope areas:</p> <ul style="list-style-type: none"> • Requires minimizing the amount of cutting or embankment, general grading, and removal of vegetative cover. • Requires use of silt fences to control runoff during construction (to be kept in place during construction) • As necessary, requires terracing, placement of sod, planting, and construction of retaining walls. • Land where topsoil has been removed or covered over by fill shall be seeded to provide an effective cover crop within the first growing season following the start of said operation.
grading & excavation	Excavation is not recommended between November 15th and March 15th.
mining	Permitted with a Conditional Use Permit. Applicant must guarantee that area will be returned to a usable slope at the conclusion of a gravel pit operation.
2) Drainage & Storm-water Management	
drainage & storm water facilities & easements	Conditional Use Permit Standards require that "adequate utilities, access roads, drainage, or necessary facilities have been or will be provided."
impervious surfaces	<p>Maximum lot coverage (buildings and structures)</p> <ul style="list-style-type: none"> • LR-1 and LR-2 = 50% • B = 30% • A, R-1 and R-2 = no maximum lot coverage.
flood management	
3) Ground- and Drinking Water/Sewage	
private water systems (wells) on-site sewage systems (septic)	When public water and sewer are not available, the applicant must leave enough property unoccupied by structure or paving for a well and septic system, to be installed in conformance with the Livingston County Department of Health.
4) Other	

Town of Geneseo

Issue	Zoning Law Overview
1) Erosion & Sedimentation Control	Special Use Permit requirement: The proposed will not cause undue harm to or destroy existing sensitive natural features on the site or in the surrounding area or cause adverse environmental impacts such as significant erosion and/or sedimentation, slope destruction, flooding or ponding of water or degradation of water quality.
Riparian buffers & wetlands	
Vegetation retention & enhancement	
Open land and parks	
Setbacks	<p>Lakeshore & Adjacent Upland Zoning Districts</p> <ul style="list-style-type: none"> • <u>Lake Shore (L)</u>: Front = 75 feet; Rear = 5 feet (building to waterline at 817 feet mean lake level); Side = 10 feet Minimum lot width = 100 feet Minimum lot size = 6,000 sq. feet • <u>Lake Residential (LR)</u>: Front = 100 feet; Rear = 30 feet; Side = 15 feet (Conditionally permitted uses = 25 feet Minimum lot width = 150 feet (1-family) or 200 feet (2-family) Minimum lot size = 30,000 sq. feet (1-family) or 40,000 sq. feet (2-family) • <u>Lake Neighborhood Business (LNB)</u>: Front = 125 feet; Rear = 40 feet; Side = 15 feet Minimum lot width = 150 feet Minimum lot size = 1 acre
	<p>Zoning Districts Beyond the Shoreline Areas</p> <ul style="list-style-type: none"> • <u>Highway Residential</u>: Front = 150 feet; Rear = 30 feet; Side = 15 feet Minimum lot width = 500 feet Minimum lot size = 217,800 sq. feet (5 acres) • <u>Agricultural (A)</u>: Front = 70 feet; Rear = 30 feet; Side = 15 feet Minimum lot width = 150 feet (1-family) or 200 feet (2-family) Minimum lot size = 30,000 sq. feet (1-family) or 40,000 sq. feet (2-family)
Steep slope restrictions	
Grading & excavation	<ul style="list-style-type: none"> • Any excavations for the removal of topsoil or other earth products must be adequately drained to prevent the formation of pools of water or drainage onto neighboring property. • Unless specifically permitted, open excavations shall not be maintained, except those excavations made for the erection of a building or structure for which a permit has been issued. • The surface area of any yard or open space adjacent to a building or structure shall be graded so that surface water will be drained away from any such structure.
2) Drainage & Storm-water Management	It is the Town's policy to preserve the normal flow of water and the normal fall of land whenever possible.
Drainage & storm water facilities & easements	
Impervious surfaces	<p>Maximum lot coverage (buildings and structures)</p> <ul style="list-style-type: none"> • L and LR = 35% • LNB = 40% • HR = 30% • A = not applicable
Flood management	The top of any foundation wall or pier located on property adjacent to Conesus shall be at least six feet above the mean lake level of 817 feet.
3) Ground- and Drinking Water/Sewage	
Private water systems (wells) and sewage systems (septic)	
4) Other	<ul style="list-style-type: none"> • Cluster developments are permitted in any district. • Requires public water and sewer service. • All land which is not designed for residential areas, roads or for other public purposes shall be set aside as common open space or recreation land. • Natural features, such as water bodies, marsh areas, steep slopes, forest areas, hilltops and rock outcrops shall be preserved as common open space or recreational land.

Town of Groveland

Issue	Zoning Ordinance Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	
vegetation retention & enhancement	
open land and parks	
setbacks	<p>Lakeshore & Adjacent Upland Zoning Districts</p> <ul style="list-style-type: none"> • <u>Lake Residential (LR)</u>: Front = 100; Rear = 30; Side = 15 (Conditional Uses = 25 feet) Minimum lot width = 100 feet (1- and 2-family), 200 feet (other permitted uses, except agriculture), or 300 feet (Conditional uses) Minimum lot size = 20,000 sq. feet (1- and 2-family), 3 acres (other permitted uses, except agriculture); or 10 acres (Conditional uses) • <u>Lake Shore Residential (LSR)</u>: Front = 75 feet; Rear = 5 feet (measured from mean lake level of 817'); Side = 6 feet Minimum lot width = 50 feet Minimum lot area = 6,000 sq. feet
	<p>Zoning Districts Beyond the Shoreline Areas</p> <ul style="list-style-type: none"> • <u>Watershed-Reservoir (WR)</u>: setbacks not applicable Minimum lot width and lot area = not applicable • <u>Agricultural (A)</u>: Front = 60 feet; Rear = 30 feet; Side = 15 feet Minimum lot width = 150 feet Minimum lot size = 2 acres
steep slope restrictions	
grading & excavation	<ul style="list-style-type: none"> • <u>A, LR, and LSR districts</u>: Surface area of any yard or open space adjacent to a building or structure shall be graded so as to provide that surface water will be drained away from any such building or structure. • <u>LR and LSR districts</u>: Open excavations shall not be maintained, except those excavations made for the erection of a building or structure for which a building permit has been issued. • Removal of topsoil is permitted in the Agricultural (A) zoning district, provided that the removal shall not endanger the productivity of the area to be stripped
2) Drainage & Storm-water Management	
drainage & storm water facilities & easements	
impervious surfaces	<p>Maximum lot coverage (buildings and structures)</p> <ul style="list-style-type: none"> • LR = 35% (1- and 2-family), 15% (other permitted uses), 10% (Conditional uses) • LSR = 35% • WR and A = not applicable
flood management	<u>LSR district</u> : Top of foundation wall should be at least 6 feet above the mean lake level of 817 feet.
3) Ground- and Drinking Water/ Sewage	
private water systems (wells)	
on-site sewage systems (septic)	
4) Other	

Town and Village of Livonia

Issue	Zoning Law Overview																								
<p>1) Erosion & Sedimentation Control</p> <p>and</p> <p>riparian buffers & wetlands</p>	<ul style="list-style-type: none"> • <u>Conesus and Hemlock Lake Watershed land conservation areas</u> <ul style="list-style-type: none"> - New structures shall be designed and constructed in such manner as to avoid undue adverse environmental impacts. Development must follow erosion and sediment control BMPs and stormwater management BMPs as listed in pages 65-93 in Chapter 6 of the NYSDEC Stream Corridor Management Manual. - All land-disturbing activity, including general construction, highway construction, access road construction maintenance, is prohibited except where remedial measures have been put in place to minimize erosion and sediment production as per the standards of the Livonia Design Criteria and New York State Guidelines for Stream Corridor Management and Erosion and Sediment Control. 																								
<p>vegetation retention & enhancement</p>	<ul style="list-style-type: none"> • <u>Wetland land conservation areas</u> <ul style="list-style-type: none"> - Development activities in wetland and wetland buffer areas shall be regulated by state and federal permit requirements. - Development shall be designed so as not to disturb the natural function and process of the wetland. • <u>Stream corridor land conservation areas</u> <ul style="list-style-type: none"> - No new public road or private road shall be located within 25 feet of the mean high-water mark except for necessary stream crossings. - New structures, except fences, bridges and fishing parking areas, shall not be constructed within 25 feet of the mean high-water mark. - Buffer strips established in the Livonia Code to separate all new structures, except fences, bridges and fishing parking areas, from the stream. - New structures and roads must follow erosion and sediment control BMPs and stormwater management BMPs as listed in pages 65-93 in Chapter 6 of the NYSDEC Stream Corridor Management Manual. - Buffer strips for logging areas established. No more than 1/3 of the timber will be removed in a ten-year period within the buffer strip. A professional timber harvesting program is required. 																								
<p>open land and parks</p>	<ul style="list-style-type: none"> • <u>Forest/woodland land conservation areas</u> <ul style="list-style-type: none"> - Minimize the number of trees 30 feet and over in height that would have to be removed or would otherwise disturb the forest floor. - Activities shall be guided in their layout by a qualified forester or landscape professional. • <u>Landscaping, Screening and Buffer Regulations</u> <ul style="list-style-type: none"> - Purpose of these regulations include: 1) Provide natural visual screening of parking areas and along property boundaries to protect the existing visual quality of adjacent lands; 2) Reduce surface runoff and minimize soil erosion through the natural filtering capability of landscaped areas - Requires that existing site vegetation and unique site features, such as stone walls, shall be incorporated into landscaping plans to the maximum extent feasible. - Issuance of a Certificate of Occupancy shall require completion of lot grading, seeding and required landscaping or posting of a performance guarantee if the applicant cannot perform the work due to seasonal impracticalities. • <u>Landscaping plan</u> <ul style="list-style-type: none"> - Based on the scale and location of the project, the CEO or Joint Planning Board shall determine whether a landscaping plan must be prepared by a licensed landscape architect, landscape designer or other professional. 																								
<p>Setbacks</p>	<p>Lakeshore Zoning Districts</p> <ul style="list-style-type: none"> • <u>Neighborhood Residential (NR):</u> Front = 30 feet (Village Road) or 50 feet (all other roads); Rear = 30 feet; Side = 15 feet <table style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="padding-left: 20px;"><i>Single-Family Dwelling</i></td> <td style="padding-left: 20px;"><i>Min. lot size</i></td> <td style="padding-left: 20px;"><i>Min. lot width</i></td> </tr> <tr> <td style="padding-left: 40px;">With public water & sewer</td> <td>15,000 sq. feet</td> <td>90 feet</td> </tr> <tr> <td style="padding-left: 40px;">With public water only</td> <td>20,000 sq. feet</td> <td>100 feet</td> </tr> <tr> <td style="padding-left: 40px;">With no public utilities</td> <td>40,000 sq. feet</td> <td>150 feet</td> </tr> <tr> <td style="padding-left: 20px;"><i>Two-Family Dwelling</i></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 40px;">With public water & sewer</td> <td>20,000 sq. feet</td> <td>90 feet</td> </tr> <tr> <td style="padding-left: 40px;">With public water only</td> <td>40,000 sq. feet</td> <td>100 feet</td> </tr> <tr> <td style="padding-left: 40px;">With no public utilities</td> <td>80,000 sq. feet</td> <td>150 feet</td> </tr> </table> • <u>Waterfront Development (WD): Town Only</u> <ul style="list-style-type: none"> Front = 35 feet from state highway or 25 feet from a driveway, shared access road or dedicated local road; Rear (waterside) = 25 feet from mean high water level; Side = 15 feet Minimum lot width = 50 feet Minimum lot size = established by Joint Planning Board 	<i>Single-Family Dwelling</i>	<i>Min. lot size</i>	<i>Min. lot width</i>	With public water & sewer	15,000 sq. feet	90 feet	With public water only	20,000 sq. feet	100 feet	With no public utilities	40,000 sq. feet	150 feet	<i>Two-Family Dwelling</i>			With public water & sewer	20,000 sq. feet	90 feet	With public water only	40,000 sq. feet	100 feet	With no public utilities	80,000 sq. feet	150 feet
<i>Single-Family Dwelling</i>	<i>Min. lot size</i>	<i>Min. lot width</i>																							
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With no public utilities	80,000 sq. feet	150 feet																							
	<p>Zoning Districts Beyond the Shoreline Areas</p> <ul style="list-style-type: none"> • <u>Agricultural Residential Conservation-3 (ARC-3): Town Only</u> Front = 75 feet; Rear = 30 feet; Side = 15 feet. <ul style="list-style-type: none"> Minimum lot width = 250 feet Minimum lot size = 3 acres • <u>Agricultural Residential Conservation-5 (ARC-5): Town Only</u> Front = 75 feet; Rear = 30 feet; Side = 15 feet. <ul style="list-style-type: none"> Minimum lot width = 350 feet Minimum lot size = 5 acres 																								

Town and Village of Livonia (cont'd.)

	<ul style="list-style-type: none"> • Core Commercial (CC): Village Only Front = 20 feet or average of block; Rear = 25 feet or average of block; Side = zero setback and fire wall encouraged, otherwise 10 feet Minimum lot width = 50 feet Minimum lot size = established by Joint Planning Board • Gateway Commercial (GC): <i>Yard Abutting Commercial or Industrial District or Use:</i> Front = 40 feet; Rear = 50 feet; Side = 20 feet <i>Yard Abutting Residential or Transitional District or Use:</i> Front = 40 feet; Rear = 100 feet; Side = 100 feet Minimum lot width = 75 feet Minimum lot size = established by Joint Planning Board • Transitional Development (TD): Front = 50 feet; Rear = 30 feet; Side = 20 feet Minimum lot width = same as NR Minimum lot size = 15,000 sq. feet (Single- and Two-family); 5,000 sq. feet/dwelling unit (Multifamily); 5 acres (Mobile home park); Commercial use lot requirements - established by Joint Planning Board
Steep slope restrictions	<ul style="list-style-type: none"> • Steep slope land conservation areas <ul style="list-style-type: none"> - Site plans shall be prepared by a licensed architect or professional engineer and engineered specifically for the steep slope where the building will be placed. - Architectural designs shall minimize the amount of cutting into the embankment, general grading and removal of vegetative cover. A rectangular-shape structure which can be placed parallel to the contour of the hill and/or designing a cantilevered structure for maximum exposure above the ground is acceptable. - Location of driveway, walkway, accessory buildings and structures and general grading shall minimize disturbance of steep slope areas and potential for erosion. - Terracing, sodding, planting and the construction of retaining walls shall be performed as found necessary.
Grading & excavation	(Included as a part of text in other rows.)
2) Drainage & Storm-water Management	
Drainage & storm water facilities & easements	<ul style="list-style-type: none"> • Conesus and Hemlock Lake Watershed land conservation areas • Storm sewer outlets shall not be made directly to lakes, impoundments, streams or their tributary watercourses, without other treatment.
Impervious surfaces	<p>Maximum lot coverage (buildings and structures)</p> <ul style="list-style-type: none"> • NR = 25% • ARC-3 = 10% • ARC-5 = 10% • CC = 30% (100% may be required at the discretion of the Joint Planning Board if adjacent buildings are built to the lot line.) • TD = 30% • WD = Minimum of 30% shall be set aside as planted open space. Building coverage shall not exceed 40%.
Flood management	<ul style="list-style-type: none"> • Floodplain land conservation areas <ul style="list-style-type: none"> - Structures shall be designed and anchored to prevent the flotation, collapse or lateral movement of the structure or portion of the structure due to flooding. - Construction materials and utility equipment that are resistant to flood damage shall be used. - Construction methods and practices that will minimize flood damage shall be used. - Adequate drainage shall be provided in order to reduce exposure to flood hazard Ø - Public utilities and facilities shall be located as to minimize or eliminate flood damage.
3) Ground- and Drinking Water/ Sewage	
Private water systems (wells)	
On-site sewage systems (septic)	
4) Other	<p>Incentive Zoning (includes Residential Cluster Developments)</p> <ul style="list-style-type: none"> - The purpose of the incentive zoning provision is to offer incentives to applicants who provide amenities that assist Livonia in implementing specific physical, environmental or cultural policies of the Comprehensive Plan. - Incentives may be offered to applicants in any district who offer an acceptable amenity to the community in exchange for the incentive. - Allowable amenities include: permanent conservation of natural areas or agricultural lands; provision of passive/active open space; infrastructure improvements; public access to waterfronts; provision of trail linkages; preservation of scenic views; provision of cross access easement or shared access. - Allowable incentives include: increases in dwelling unit density (limited to one dwelling unit per acre unless public water and sewer are available); increases in lot coverage; changes in setback or height standards; change of use. - Livonia Code provides illustrated examples of residential cluster development layouts.

Town of Sparta

Issue	Zoning Law Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	
vegetation retention enhancement	Special Use Permit applications must show the design and treatment of existing and proposed open areas, buffer & areas, and screening devices, including dimensions of all areas devoted to lawns, trees, and other landscaping.
open land and parks	
setbacks	<p>Zoning Districts Beyond the Shoreline Areas</p> <ul style="list-style-type: none"> • Commercial (C): Front = 50 feet; Rear = 20 feet; Side = 15 feet Minimum lot width = 100 feet at building line Minimum lot size = 20,000 sq. feet • Highway Residential (HR): Front = 50 feet; Rear = 20 feet; Side = 10 feet Minimum road frontage = 250 feet Minimum lot size = 108,900 sq. feet (2.5 acres) • Agricultural/Residential (A/R): Front = 50 feet; Rear = 20 feet; Side = 10 feet Minimum lot width = 200 feet at front building line Minimum lot size = 60,000 sq. feet (Larger lot size may be required after review of soils and perc test data by the County Department of Health.
steep slope restrictions	Land conservation overlay zone established to delineate and protect areas in the town where substantial development of the land may cause ecological harm. If a use is in the zone, it is considered a Special Use.
grading & excavation	
mining	<ul style="list-style-type: none"> • Requires a Special Use Permit. • Minimum lot = 10 acres. • All excavated land must be rehabilitated in accordance with reclamation plans within one year after the termination of operations. • Any area of land consisting of more than one acre from which topsoil has been removed or covered over by fill shall be seeded to provide an effective cover crop within the first growing season following the start of said practice.
2) Drainage & Stormwater Management	
drainage & storm water facilities & easements	Special Use Permit applications must show provisions for storm drainage.
impervious surfaces	<p>Maximum lot coverage</p> <p>No maximum lot coverage requirements specified.</p>
flood management	<p><u>Flood Hazard Overlay District:</u> Boundaries = FEMA flood hazard areas as defined by Flood Insurance Rate Maps.</p> <p>Uses must comply with the Town Flood Damage Prevention Law.</p>
3) Ground- and Drinking Water/ Sewage	
private water systems (wells)	<ul style="list-style-type: none"> • Existing or proposed locations must be shown on zoning permit application. • Need documentation by the Livingston County Department of Health that adequate water supply can be available to the site.
on-site sewage systems (septic)	<ul style="list-style-type: none"> • Existing or proposed locations must be shown on zoning permit application. • Need documentation by the Livingston County Department of Health that adequate sewage disposal facilities can be available to the site.
4) Other	<ul style="list-style-type: none"> • Zoning permit must show significant natural or environmental features such as wooded areas, rock outcroppings, and steep slopes (more than 15%). • Cluster developments are allowed in the A/R zone.

Site Plan Review Criteria

Town of Conesus	
Issue	Site Plan Review Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	
vegetation retention & enhancement	
open land and parks	
setbacks	
steep slope restrictions	
grading & excavation	
2) Drainage & Stormwater Management	
drainage & storm water facilities & easements	<ul style="list-style-type: none"> • The Planning Board must consider adequacy of stormwater and sanitary waste disposal facilities. • The Planning Board must consider the adequacy of structures, roadways and landscaping in areas with moderate to high susceptibility to flooding and ponding and/or erosion.
impervious surfaces	
flood management	Must provide base flood elevation data for proposed structures in a floodplain area.
3) Ground- and Drinking Water/ Sewage	
private water systems (wells)	The Planning Board must consider the adequacy of water supply facilities.
on-site sewage systems (septic)	
4) Other	

Town of Geneseo

Issue	Site Plan Review Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	<u>Preliminary Site Plan requirement:</u> Must show the location of existing watercourses, New York State and federal wetlands.
vegetation retention	<u>Preliminary Site Plan requirement:</u> Must show the location of existing wooded areas, rock outcrops, isolated trees & enhancement with a diameter of 8" or more measured 3' above the base of the trunk, and other significant features. <u>Design and review standards:</u> - Landscaping shall be an integral part of the entire project area and shall buffer the site from and/or integrate the site with the surrounding area, as appropriate. - Whenever appropriate, existing trees shall be conserved and integrated into the landscape design plan.
open land and parks	<u>Preliminary Site Plan requirement:</u> Plan must show the percentage of open space provided, the location and development of all proposed buffer areas, including indication of proposed vegetative cover.
setbacks	
steep slope restrictions	<u>Preliminary Site Plan requirement:</u> Plan must show existing contours with intervals of 10 feet or less.
grading & excavation	<u>Design and review standards:</u> The design of buildings and parking facilities shall take advantage of the natural topography of the project site.
2) Drainage & Storm-water Management	
drainage & storm water facilities & easements	<u>Preliminary Site Plan requirement:</u> Plan must have a drainage plan showing existing and proposed watercourses, proposed detention/retention facilities and calculations of the impact to existing drainage created by the proposed development. <u>Design and review standards:</u> Drainage of the site and surface waters flowing therefrom shall not adversely affect adjacent properties or public roadways.
impervious surfaces	
flood management	<u>Preliminary Site Plan requirement:</u> Plan must show approximate boundaries of any areas subject to flooding or stormwater overflows.
3) Ground- and Drinking Water/ Sewage	
Private water systems (wells) On-site sewage systems (septic)	<u>Preliminary Site Plan requirement:</u> Plan must show the description of the water supply system, location of well(s) and/or all proposed water lines, valves and hydrants and of all sewer lines and alternate means of water supply and sewage disposal and treatment.
4) Other	

Town of Groveland

Issue	Site Plan Review Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	<u>Lot development standards</u> : Sites to be developed shall avoid state regulated freshwater wetlands and fringes of water bodies or watercourses.
vegetation retention	<ul style="list-style-type: none"> • Site plans must provide location and development of all proposed buffer areas, including an indication of existing & enhancement and proposed vegetative cover and all existing trees over 8" in diameter. • Must also provide general landscaping and planting schedule. • <u>Design standard</u>: Environmentally sensitive areas shall be protected and left undisturbed.
open land and parks	
setbacks	
steep slope restrictions	<u>Lot development criteria</u> : Sites to be developed shall avoid areas where slopes are greater than 15%.
grading & excavation	Site plans must show grading and drainage plan, showing existing and proposed contours and watercourses.
2) Drainage & Stormwater Management	
drainage & storm water facilities & easements	<u>Design standard</u> : Stormwater and drainage facilities must be adequate for the site.
impervious surfaces	
flood management	<u>Lot development criteria</u> : Sites to be developed shall avoid areas of high groundwater (seasonal or permanent) and soils with excessively slow or fast percolation and flood hazard areas.
3) Ground- and Drinking Water/ Sewage	
private water systems (wells)	Site plans must describe the method of securing water, location of such facilities, and approximate quantity of water required.
on-site sewage systems (septic)	Site plans must describe the method of sewage disposal and the location of the facilities on the site plan.
4) Other	<u>Lot development criteria</u> : Sites to be developed should avoid areas where bedrock is less than five feet from the surface and areas of frequent rock outcrops.

Town and Village of Livonia

Issue	Site Plan Review Overview
1) Erosion & Sedimentation Control	Review of preliminary site plan will consider the size, location, arrangement and use of required open space and adequacy of such open space to preserve scenic views and other natural features, to provide wildlife corridors and habitats, to provide suitable screening and buffering; and to provide required recreation areas.
Riparian buffers & wetlands	
Vegetation retention & enhancement	<u>Preliminary site plan:</u> <ul style="list-style-type: none"> - Must show the location of proposed buffer areas, including existing vegetative cover. - Must include a landscaping plan and planting schedule.
Open land and parks	
Setbacks	
Steep slope restrictions	
Grading & excavation	<ul style="list-style-type: none"> • Preliminary site plan must have a grading and drainage plan. The drainage plan shall clearly explain the methodology used to project stormwater quantities and the resultant peak flow conditions. • Review of preliminary site plan shall consider the adequacy of stormwater calculation methodology and stormwater and drainage facilities to eliminate off-site runoff and maintain water quality.
2) Drainage & Stormwater Management	
Drainage & storm water facilities & easements	
Impervious surfaces	
Flood management	
3) Ground- and Drinking Water/Sewage	
Private water systems (wells)	<ul style="list-style-type: none"> • Preliminary site plan must provide a description of the type and quantity of water supply needed, the method of securing water supply, and the location, design and construction materials of such facilities. • Review of preliminary site plan shall consider the adequacy of water supply facilities.
On-site sewage systems (septic)	<ul style="list-style-type: none"> • Preliminary site plan must provide a description of the type and quantity of sewage expected, the method of sewage disposal and the location, design and construction materials of such facilities. • Review of preliminary site plan shall consider the adequacy of sewage disposal facilities.
4) Other	

Town of Sparta

Issue	Site Plan Review Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	
vegetation retention & enhancement	
open land and parks	
setbacks	
steep slope restrictions	<p>Development in the Land Conservation Overlay Zone</p> <ul style="list-style-type: none"> • Site plans must include location of slopes 5% or greater. • Site plans must be prepared by a licensed architect, landscape architect or engineer. • Site plans must adhere to the following guidelines, at a minimum: <ol style="list-style-type: none"> a) The architectural design of structures shall be such as to minimize the amount of cutting into the embankment, general grading, and removal of vegetative cover. b) The location of the driveway, walkway and accessory buildings and general overall grading shall conform to a). c) Terracing, sodding, planting and construction of retaining walls shall be performed as necessary. d) Development shall conform to standards in the NY Guidelines for Urban Erosion and Sediment Control.
grading & excavation	
2) Drainage & Stormwater Management	
drainage & storm water facilities & easements	<ul style="list-style-type: none"> • Site plans must show proposed grading and drainage. • Site plan review must assess the adequacy of these features.
impervious surfaces	
flood management	
3) Ground- and Drinking Water/ Sewage	
private water systems (wells)	<ul style="list-style-type: none"> • Site plans must show details on water supply and sewage facilities. • Site plan review must assess the adequacy of these features.
on-site sewage systems (septic)	
4) Other	

Subdivision Regulations

Town of Conesus	
Issue	Subdivision Regulations Overview
1) Erosion & Sedimentation Control	
Riparian buffers & wetlands	
Vegetation retention enhancement	<ul style="list-style-type: none"> • The Planning Board shall, whenever possible, establish the preservation of all natural features which add value to & residential developments and to the community, such as large trees or groves, watercourses or falls, beaches, historic spots, vistas and similarly irreplaceable assets. • No tree with a diameter of 8" or more as measured 3' above the trunk shall be removed unless it is in a road right-of-way shown on the final subdivision plat. • For the Preliminary Plat review of a major subdivision, the applicant must document the location of all 8"-diameter trees and other significant features on the lot.
Open land and parks	<ul style="list-style-type: none"> • The Planning Board shall require that the subdivider reserve sites of a character, extent, and location suitable for development of a park, playground or other recreational purpose. • For major subdivisions, the land must have at least 5%, or at least 2 acres, reserved for parkland. The requirement can be waived by the Planning Board if a recreation area cannot be properly located therein, but the subdivider must pay the Town \$30 per lot.
setbacks	
steep slope restrictions	
grading & excavation	
2) Drainage & Storm-water Management	
drainage & storm water facilities & easements	Major subdivision preliminary plats must have a storm drainage plan indicating the approximate location and size of proposed lines and their profiles.
impervious surfaces	
flood management	<ul style="list-style-type: none"> • Any culverts or drainage facilities must be designed to accommodate potential runoff from its entire upstream drainage area, whether inside or outside the subdivision. • Land subject to flooding or deemed by the Planning Board to be uninhabitable shall not be plotted for residential development, nor for such other uses that may increase the danger to health, life or property, or aggravate the flood hazard.
3) Ground- and Drinking Water/ Sewage	
private water systems (wells)	
on-site sewage systems (septic)	
4) Other	

Town of Geneseo

Issue	Subdivision Regulations Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	
vegetation retention enhancement	Preliminary Plat requirement: Preliminary plats must show the location of all significant trees, wooded areas, & watercourses and other significant natural features.
open land and parks	<p><u>Design Standards:</u></p> <ul style="list-style-type: none"> - Unless waived by the Planning Board, the subdivider shall provide and dedicate a park or parks suitably located for playground or other recreational purposes and of a size sufficient to serve the proposed subdivision. - In residential areas, the minimum amount of land that may be dedicated shall be 10% of the gross acreage of the subdivision. - In lieu of such a provision, the Planning Board may require as a condition of final plat approval a payment to the town for such park or recreation use, of an amount equal to the appraised value of such a piece of land having frontage on a public road as determined by the Planning Board. These funds shall be reserved and expended for the acquisition or development of park or recreation lands.
setbacks	
steep slope restrictions	
grading & excavation	
2) Drainage & Stormwater Management	
drainage & storm water facilities & easements	<p><u>Design Standards:</u> Lots shall be laid out to encourage positive drainage away from proposed building areas, and wherever desirable, natural drainage courses shall be maintained.</p> <p><u>Preliminary Plat requirement:</u> Location of all proposed septic tanks and drainage field locations must be shown.</p>
impervious surfaces	
flood management	
3) Ground- and Drinking Water/ Sewage	
private water systems (wells)	<p><u>Design Standards:</u></p> <ul style="list-style-type: none"> - If the land to be subdivided is not served by a municipal water supply system, the Planning Board may require the applicant to demonstrate the source and adequacy of any water supply to said land. This may include but shall not be limited to the drilling of test wells on the site of said subdivision. - Where public water supply is reasonably accessible, in the opinion of the Planning Board, the subdivided lot(s) must hook up to the public water supply system.
on-site sewage systems (septic)	<p><u>Design Standards (for both private wells and septic systems):</u></p> <ul style="list-style-type: none"> - Where evidence indicates that the requirements of the Zoning Ordinance are not adequate, the Planning Board may require tests, in accordance with the rules and regulations of the State Health Department, undertaken at the expense of the developer, to determine the adequacy of the proposed lot size and existing grade and soil conditions. In all such cases where the tests indicate a larger lot size to be necessary, the Planning Board may employ the services of a registered and qualified independent sanitary engineer for advice as to the minimum lot size and/or facilities necessary to prevent unsanitary conditions and hazards to the public health. In such cases, the cost of retaining the services of a qualified engineer shall be borne by the developer. - Where the public sanitary sewer, in the opinion of the Planning Board, is reasonably accessible, sanitary sewers shall be installed to adequately serve all lots with connections to the public system.
4) Other	

Town of Groveland

Issue	Subdivision Regulations Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	
vegetation retention enhancement	<ul style="list-style-type: none"> • The Planning Board shall, whenever possible, establish the preservation of all natural features which add value to & residential developments and to the community, such as large trees or groves, watercourses or falls, beaches, historic spots, vistas and similarly irreplaceable assets. • No tree with a diameter of 8" or more as measured 3' above the trunk shall be removed unless it is in a road right-of-way shown on the final subdivision plat. • For the Preliminary Plat review of a major subdivision, the applicant must document the location of all 8"-diameter trees and other significant features on the lot.
open land and parks	<ul style="list-style-type: none"> • The Planning Board shall require that the subdivider reserve sites of a character, extent, and location suitable for development of a park, playground or other recreational purpose. • For major subdivisions, the land must have at least 5%, or at least 2 acres, reserved for parkland. The requirement can be waived by the Planning Board if a recreation area cannot be properly located therein, but the subdivider must pay the Town an appropriate fee per lot.
setbacks	
steep slope restrictions	
grading & excavation	
2) Drainage & Stormwater Management	
drainage & storm water facilities & easements	Major subdivision preliminary plats must have a storm drainage plan indicating the approximate location and size of proposed lines and their profiles.
impervious surfaces	
flood management	<ul style="list-style-type: none"> • Any culverts or drainage facilities must be designed to accommodate potential runoff from its entire upstream drainage area, whether inside or outside the subdivision. • Land subject to flooding or deemed by the Planning Board to be uninhabitable shall not be plotted for residential development, nor for such other uses that may increase the danger to health, life or property, or aggravate the flood hazard.
3) Ground- and Drinking Water/ Sewage	
private water systems (wells)	
on-site sewage systems (septic)	
4) Other	

Town and Village of Livonia

Issue	Subdivision Regulations Overview
1) Erosion & Sedimentation Control	Major subdivision plats must show existing natural features within 200 feet of the proposed subdivision. Natural features shall include but are not limited to natural forests, steep slopes, floodplains, scenic views, stream corridors and wetlands subject to the land conservation standards in the Zoning chapter of the Livonia Code.
Riparian buffers & wetlands	
Vegetation retention & enhancement	
Open land and parks	<u>Major subdivision plats</u> <ul style="list-style-type: none"> - Must show all parcels of land proposed to be dedicated to public use and the conditions of such dedication, including maintenance easements - Must show the location of proposed permanent open space.
Setbacks	
Steep slope restrictions	
Grading & excavation	Major subdivision plats must show an approximate grading plan if natural contours are to be changed more than two feet.
2) Drainage & Stormwater Management	
Drainage & storm water facilities & easements	
Impervious surfaces	
Flood management	Minor subdivision plats must show the boundaries and designation of any flood hazard zones located on the property.
3) Ground- and Drinking Water/Sewage	
Private water systems (wells) On-site sewage systems (septic)	<ul style="list-style-type: none"> • Minor subdivision plats must show the location of any wells and septic systems within 100 feet of any property boundary • Major subdivision plats must show the location of existing sewers, water mains, culverts and drains on the property, with pipe sizes, grades and direction of flow. • Applicants must submit records of soil percolation tests and groundwater availability, demonstrating that any proposed on-site water supply and sewage disposal systems are feasible for the lot sizes and density of the proposed subdivision.
4) Other	Cluster developments may be required in the NR, ARC-3, ARC-5 and TD Districts.

Town of Sparta

Issue	Subdivision Regulations Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	
vegetation retention & enhancement	<ul style="list-style-type: none"> • All lots which are not covered by structures or paving shall be properly seeded or landscaped by the Subdivider. • No tree with a diameter of eight inches or more as measured three feet above the base of the trunk shall be removed unless the tree is within the right-of-way of a street as shown on the Subdivision Plat. • Removal of additional trees shall be subject to approval of the Planning Board.
Open land and parks	<ul style="list-style-type: none"> • Land shall be reserved for park, playground, open space or other recreational purposes in locations designated on the Town's recreation or comprehensive plans, if any, or elsewhere, where the Planning Board deems that such reservations would be appropriate. • Each reservation shall be of an area equal to ten percent of the total land area within the subdivision. • If the recreational land cannot be properly located in the subdivision, or if the Planning Board deems it undesirable, the Planning Board may then require a payment to the Town per gross acre of land which would have otherwise been acceptable as a recreational site.
setbacks	
steep slope restrictions	
grading & excavation	<ul style="list-style-type: none"> • Topsoil moved during the course of construction shall be redistributed so as to provide a minimum depth of six inches of cover to all areas of the subdivision and shall be stabilized by seeding or planting. • At no time shall topsoil be removed from the site without written permission from the Planning Board.
2) Drainage & Stormwater Management	
drainage & storm water & easements	The Planning Board may refer all residential subdivision proposals to the Livingston County Soil and Water facilities Conservation District and/or the Town Engineer for their review as to the acceptability of proposed drainage, erosion and sediment control measures both during construction phases and after completion.
impervious surfaces	
flood management	Land subject to flooding and land deemed by the Planning Board to be otherwise uninhabitable shall not be platted for residential occupancy or for such other uses so as to increase danger to health, life or property, or aggravate the flood hazard.
3) Ground- and Drinking Water/Sewage	
private water systems (wells)	All water supply systems shall be installed pursuant to plans approved by the Livingston County Department of Health.
on-site sewage systems (septic)	All wastewater disposal systems shall be installed in accordance with plans approved by the Livingston County Department of Health.
4) Other	<ul style="list-style-type: none"> • Clustered development is permitted. <ul style="list-style-type: none"> Purpose: to enable and encourage flexibility of design and development of land in such a manner as to promote the most appropriate use of the land, to facilitate the adequate and economic use of streets and utilities and to preserve the natural and scenic qualities of open lands. • Unique physical features such as historic landmarks and sites, rock out-croppings, hilltop lookouts, desirable natural contours, and similar features shall be preserved, if possible.

Town of Springwater

Issue	Minimum Lot Size Law Overview
1) Erosion & Sedimentation Control	
Riparian buffers & wetlands	
Vegetation retention & enhancement	
Open land and parks	
Setbacks	<p><u>Minimum lot size:</u> 1 acre <u>Minimum lot width:</u> 180 feet <u>Minimum lot depth:</u> 180 feet <u>Setback of all structures from a road right-of-way:</u> 25 feet <u>Side setback:</u> 10 feet <u>Rear setback:</u> 10 feet</p>
Steep slope restrictions	
Grading & excavation	
2) Drainage & Storm-water Management	
Drainage & storm water facilities & easements	
Impervious surfaces	
Flood management	
3) Ground- and Drinking Water/ Sewage	
Private water systems (wells)	No well shall be nearer than: 25 feet to the right-of-way of any State, County or Town highway, or to a private right-of-way; 10 feet to any side or rear lot boundary; 100 feet to any tilefield or septic system
On-site sewage systems (septic)	All septic systems and other septic installations shall be governed by the permit process required through the Livingston County Department of Health or its lawfully appointed successor.
4) Other	<p><u>Sketch Plan:</u></p> <ul style="list-style-type: none"> - Must be submitted to the Town before a building permit or certificate of occupancy can be issued. - Must show the existing natural features on the site; the location and dimensions of all existing structures on the parcel; and sufficient information to show that all setbacks and separation distances will be in compliance with this law.

Comprehensive/Master Plan Review

Town of Geneseo	
Issue	Comprehensive Plan Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	Comprehensive Plan identifies ways to improve the health of stream corridors, including: encouraging growth of vegetation to stabilize stream banks, and preventing construction, logging or other earth-moving activities within 50-100 feet of the stream bank.
vegetation retention & enhancement	
open land and parks	<ul style="list-style-type: none"> • See “Clustered Development” below. • Comprehensive Plan recommends the use of provisions in the subdivision regulations to obtain or finance recreational land or facilities.
setbacks	
steep slope restrictions	
grading & excavation	
2) Drainage & Stormwater Management	
drainage & storm water	
facilities & easements	
impervious surfaces	
flood management	
3) Ground- and Drinking Water/ Sewage	
Private water systems (wells)	
On-site sewage systems (septic)	
4) Other	<ul style="list-style-type: none"> • <u>Clustered development (density incentive):</u> <ul style="list-style-type: none"> -is encouraged where permanent preservation of open space or agricultural land will result. -results in more efficient use of roads, sewer and water. It avoids strip development, is often more attractive than conventional development, and helps maintain open space. “When appropriate, clustered designs may be mandated for ‘major subdivisions’ as defined in the Town and Village subdivision regulations.” • <u>Objective #9:</u> Maintain existing cottage development along the Conesus Lake shore, but discourage high density residential development on the west side of West Lake Road. • Land west of West Lake Road is proposed in the Comprehensive Plan for M-2 Medium Density Residential development. The purpose of the M-2 area is to limit the amount of additional curb cuts onto Route 256 and to minimize pollution of the lake from erosion and runoff due to development on the slope.

Town and Village of Livonia

Issue	Comprehensive Plan Overview
1) Erosion & Sedimentation Control	
Riparian buffers & wetlands	
Vegetation retention & enhancement	<ul style="list-style-type: none"> • Woodlots are an important community asset. • The land conservation section of the Town Zoning Code should require major subdivisions to respect priority woodlots and their slope stabilization, habitat, screening, and visual functions in determining an appropriate lot layout. • Subdivision plats should require delineation of the location of any features identified in the Land Conservation section of the Town Zoning Code. This will facilitate review for consistency with the conservation of important natural features.
Open land and parks	<ul style="list-style-type: none"> • The Land Use Plan identifies as permanent open space intended for conservation: <ul style="list-style-type: none"> Land within the 100 year floodplain, Wetlands of 12.4 acres or more that are regulated by NYSDEC, and Areas with slopes in excess of 15 percent. • Development in these areas requires special use approval and the use of best engineering practices. Livonia should consider requiring landowners to set aside land or contribute cash in lieu of land in proportion to the number of residential lots created. Livonia should also carefully consider any future opportunities to expand active or passive access to Conesus Lake or to provide pocket parks in commercial areas.
Setbacks	
Steep slope restrictions	
Grading & excavation	
2) Drainage & Stormwater Management	
Drainage & storm water facilities & easements	<ul style="list-style-type: none"> • The existing stormwater management facilities in the northwest quadrant of the Town are insufficient. There is no stormwater collection system associated with NYS 15/20A. Many older uses have no provisions for stormwater management or they collect and discharge stormwater directly to Conesus Lake. The existing conditions make it difficult to improve stormwater management on a lot-by-lot basis; efforts to correct a problem in one area may inadvertently create a problem in another. • As Livonia continues to develop, it may become less efficient for each individual property to accommodate drainage on site. The town and village can lower long-term maintenance costs for drainage facilities by working cooperatively with landowners to identify appropriate locations for regional drainage facilities before specific development proposals are made. • In the short-term, it is recommended that the town and property owners in the economic development opportunity area in the northwest quadrant of the town complete a drainage study. The drainage study should identify necessary facilities, appropriate locations, and provide cost estimates to be used to allocate costs among property owners/development proposals. The NYSDOT may also be a party in the analysis and execution of appropriate drainage control in this area.
Impervious surfaces	
Flood management	
3) Ground- and Drinking Water/ Sewage	
Private water systems (wells)	<ul style="list-style-type: none"> • Housing will be encouraged in and around existing development where public utilities can be efficiently extended and will be discouraged outside these development nodes. • No substantial capital investment for water or sewer infrastructure is anticipated to serve development in areas designated for agricultural/residential or rural residential use. <p><u>In support of cluster developments:</u> Efforts should be taken to educate potential homeowners regarding the long-term risk of private water supply and sewage treatment facilities. Educational/marketing information should have a positive “did you know” tone that clearly conveys the certainty of reliable water supply and sewage treatment from public utilities and the potential risks of inadequate supply or costly treatment systems over the long-term for lots where density or location indicates no potential for installation of public utilities.</p>
On-site sewage systems (septic)	

Town and Village of Livonia (cont'd.)

4) Other

• Cluster Developments

- The preferred development pattern for residential uses is clustered development, which allows development and preservation of land in its natural state.
- Public education will be necessary to encourage landowners and home buyers to recognize the value of purchasing in a clustered residential development.
- Development Standards: Criteria for cluster developments should include the potential for continued active agricultural use of the land; preservation of sensitive environmental features already identified for conservation; preservation of natural areas that support the ecosystem of lands identified for conservation; or the preservation of undeveloped land that protects scenic vistas or provides segments of planned trail linkages.

• The Comprehensive Plan references the Hemlock Lake and Conesus Lake Watershed Protection Regulations, including the protection zones within which certain land uses or development activities are prohibited and/or regulated. The type of activities prohibited or regulated depends on the distance of a property from the lakeshore, public water supply inlet pipes, and tributary streams.

• Any new development that occurs around Conesus Lake should be of a scale consistent with existing uses. Care should also be taken to ensure that new development does not obscure the lake views of existing uses.

• Site Plan Review Recommendations:

Livonia's site plan submission requirements should be amended to include information such as the following:

- Location of any features requiring a land conservation special permit and identification of whether there are archaeological sites which should be preserved;
- Information on the zoning/buildings/uses/natural features within 300 feet of project boundary lines;
- Information on utility, conservation, or recreation easements;
- Information on all proposed non-building structures including fences, retaining walls, and drainage facilities;
- Erosion control measures to be used during construction activities.

Town of Sparta

Issue	Master Plan Overview
1) Erosion & Sedimentation Control	
riparian buffers & wetlands	
vegetation retention & enhancement	"The Town should encourage developers in rural residential areas to maintain vegetative buffers and tree borders along roadways and between adjacent residences."
open land and parks	Goal: Direct the Town's land use and development program in a manner that enhances the natural landscape, helps to create an open space system and establishes a natural environment that reinforces the rural character of the community.
setbacks	
steep slope restrictions	
grading & excavation	
2) Drainage & Stormwater Management	
drainage & storm water facilities & easements	"As a large area of the Town is characterized by poor drainage, local officials should carefully review all development projects for their potential effects on drainage."
impervious surfaces	
flood management	<ul style="list-style-type: none"> • "Limit new residential development in areas which are environmentally sensitive. This would include areas subject to natural flooding, areas with erodible soils, wetlands, steeply sloped areas and other locations characterized by similar physical limitations." • Master Plan recommends the creation of Environmental Protection Overlay Districts (EPOD). The EPOD concept establishes special regulations to protect land areas that are environmentally sensitive. The regulations are superimposed over an existing primary zone district and can be designed to address the land areas with such special characteristics as erodible soils, steeply sloped areas, woodlands, wetlands and flood hazard areas.
3) Ground- and Drinking Water/Sewage	
private water systems (wells)	
on-site sewage systems (septic)	
4) Other	<ul style="list-style-type: none"> • Master Plan indicates that land availability is not a constraint for Sparta. It further indicates that the Town should be able to accommodate the projected development while preserving the Town's existing character. • Master Plan recommends the use of such measures as clustering to protect natural features, conserve energy and reduce public service costs. • Goal: Protect the community's important environmental resources (e.g. aquifers, soils, wetlands, steep slopes, woodlands and floodplains) from the potential adverse effects of development. • <u>Agricultural Practices</u> <ul style="list-style-type: none"> - "New non-farm development should be discouraged on prime agricultural soils." - Goal: Maintain the viability of the Town's agricultural economy, protect prime production lands and maintain Sparta's rural character. - Policies: <ul style="list-style-type: none"> Foster agriculture through the adoption of land use regulations which do not curtail farming operations within the Town's agricultural area. Limit residential development in productive agricultural areas to low-density single-family units. Utilize site plan techniques to minimize the potential loss of prime agricultural soils and disruptions to farming operations that could result from new non-farm development. - Limit the placement of public waterlines, highways, power lines and other investments that would encourage new non-farm development in those areas of the Town designated as agricultural on the land use plan.

APPENDIX 7: GOVERNMENT PROGRAMS FOR NONPOINT SOURCE POLLUTION CONTROL

Major Federal Regulations Affecting Nonpoint Source Pollution

CLEAN WATER ACT ([HTTP://WWW.EPA.GOV/REGION5/DEFS/HTML/CAA.HTM](http://www.epa.gov/region5/defs/html/CAA.htm))

The Clean Water Act (CWA) was passed in 1972 and signaled the creation of federal legislation to protect and restore the biological, chemical, and physical properties of the nation's water. This protection was to be achieved through legislation requiring a permit for the discharge of pollutants, the encouragement of best management practices to control pollution, and funding for the construction of sewage and wastewater treatment plants and facilities. The act was amended five years later and placed more stringent controls on the discharge of toxic materials and allowed states to assume responsibility over federal clean water programs.

The primary focus of the CWA and the 1977 amendments was the prevention of pollution discharges from point sources. In 1987 the act was again amended, this time to focus on nonpoint sources of pollution (NPS). The Section 319 Nonpoint Source Management Program was enacted to aid states, territories and tribal lands in reducing NPS. This is accomplished through technical and financial assistance, training, education, and the monitoring of projects aimed at curbing NPS. In addition, the EPA has requested that funding provided under section 106 of the act for water quality program assistance grants be used by states, territories, and tribal lands for the inclusion and development of programs that reduce NPS. In 1996, Section 319 funding was used in place of Clean Lakes Program (Section 314 Federal Water Pollution Control Act) funding to provide technical and financial assistance for restoring public lakes.

STORMWATER AND EROSION CONTROL ([HTTP://WWW.EPA.GOV/OWM/SW/INDEX.HTM](http://www.epa.gov/owm/sw/index.htm))

Phase I of the USEPA's Storm Water Program was promulgated in 1990 under the CWA.

Phase I relies on National Pollution Discharge Elimination System (NPDES) (<http://www.epa.gov/owm/sw/index.htm#program>) permit coverage to address storm water runoff from: (1) "medium" and "large" municipal separate storm water systems (MS4s) generally serving populations of 100,000 or greater, (2) construction activity disturbing 5 acres of land or greater, and (3) ten categories of industrial activity. In NYS NPDES permitting is under the purview of the NYSDEC, which issues a State Pollution Discharge Elimination System (SPDES) permit (for more information see Appendix I - Stormwater Management Regulations).

The *Storm Water Phase II Final Rule* (<http://www.epa.gov/owm/sw/phase2/>) was published on December 8, 1999. The permitting authority of the Storm Water Phase II Rule will be phased in over a 5-year period. The Phase II program expands the Phase I program by requiring additional operators of MS4s in urbanized areas and operators of small construction sites, through the use of NPDES permits, to implement programs and practices to control polluted storm water runoff.

Phase II is intended to further reduce adverse impacts to water quality and aquatic habitat by instituting the use of controls on the unregulated sources of stormwater discharges that have the greatest likelihood of causing continued environmental degradation, the environmental problems associated with discharges from MS4s in urbanized areas and discharges resulting from construction activity including lowering the construction activity threshold for a permit from 5 acres to 1 acre or more.

SECTION 404 WETLANDS ([HTTP://WWW.EPA.GOV/OWOW/WETLANDS/FACTS/FACT10.HTML](http://www.epa.gov/owow/wetlands/facts/fact10.html))

Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. EPA and the Army Corps of Engineers (Corps) jointly administer the program. In addition, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and State resource agencies have important advisory roles. Activities in waters of the United States that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry.

The basic premise of the program is that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. In other words, when you apply for a permit, you must show that you have a) taken steps to avoid wetland impacts where practicable; b) minimized potential impacts to wetlands; and c) provided compensation for any remaining, unavoidable impacts through activities to restore or create wetlands.

Regulated activities are controlled by a permit review process. An individual permit is usually required for potentially significant impacts. However, for most discharges that will have only minimal adverse effects, the Army Corps of Engineers often grants up-front general permits. These may be issued on a nationwide, regional, or state basis for particular categories of activities (for example, minor road crossings, utility line backfill, and bedding) as a means to expedite the permitting process.

Section 404(f) exempts some activities from regulation under Section 404. These activities include many ongoing farming, ranching, and silviculture practices. Farmers who own or manage wetlands are directly affected by two important Federal programs: (1) Section 404 of the CWA, which requires individuals to obtain a permit before discharging dredged or fill material into waters of the United States, including most wetlands, and (2) the Swampbuster provisions of the Food Security Act, which withholds certain Federal farm program benefits from farmers who convert or modify wetlands. Together, these two programs have helped to reduce the rate at which wetlands are converted to agriculture and other uses.

TOTAL MAXIMUM DAILY LOADS (TMDL) ([HTTP://WWW.DEC.STATE.NY.US/WEBSITE/DOW/TMDL.HTML](http://www.dec.state.ny.us/website/dow/tmdl.html))

Section 303(d)(1)(C) of the Clean Water Act and EPA's implementing regulations (40CFR Part 130) require states to identify those waterbodies that do not meet water quality standards after application of the technology-based effluent limitations required by the Act. The states are then required to develop a Total Maximum Daily Load (TMDL) (<http://www.epa.gov/owow/tmdl/>) analysis for the pollutants that are not meeting water quality standards in those waterbodies.

By definition, a TMDL specifies the allowable pollutant loading from all contributing sources (e.g., point sources, nonpoint sources, and natural background) at a level necessary to attain the applicable water quality standards with seasonal variations and a margin of safety that takes into account any lack of knowledge concerning the relationship between the sources of the pollutant and water quality.

CLEAN WATER ACTION PLAN (CWAP)

In 1997, twenty-five years after the passage of the CWA, the Clean Water Action Plan (CWAP) was launched. As part of President Clinton's Clean Water Initiative, the CWAP provides funding for programs developed by the EPA and USDA in conjunction with other federal agencies and state and local governments focusing on restoring and sustaining the quality and health of water resources. The CWAP is based upon four primary elements:

1. **Watershed Approach** – more effective means of planning and managing water resources compared to approaches based on political boundaries.
2. **Stricter Standards** – tighter controls and enforcement of NPS regulations as they relate to water quality at the federal and state levels.
3. **Stewardship** – greater public and private involvement in the planning and management of natural resources and their protection from NPS at the state and local levels.
4. **Informed Citizens and Officials** – increase the monitoring and reporting of water quality and the effects of NPS with greater involvement of state and local officials and agencies.

SAFE WATER DRINKING ACT ([HTTP://WWW.EPA.GOV/REGION5/DEFS/HTML/SDWA.HTM](http://www.epa.gov/region5/DEFS/html/sdwa.htm))

The Safe Drinking Water Act was passed in 1974 to protect drinking water supplies from harmful contaminants. The legislation attempts to provide safe drinking water through primary drinking water regulations, underground injection control regulations, and protection of sole source aquifers. In 1986 the act was revised to speed up implementation and included additional provisions for regulating contaminants, filtration systems, distributions systems, and wellhead protection systems.

The Safe Water Drinking Act establishes both health-related (primary) and nuisance-related (secondary) standards for public drinking water. Under the original legislation, the EPA set primary standards for 25 contaminants. The 1986 amendments required the EPA to include an additional 48 contaminants, raising the total number of chemicals regulated in drinking water to 83.

In August 1996, the Safe Water Drinking Act was amended to include a program that requires states to monitor and evaluate the quality of sources of drinking water supplies through the **Source Water Assessment Program (SWAP)** (<http://www.epa.gov/safewater/sdwa/summ.html#1A>). In addition, more stringent standards for drinking water and reporting of contaminant levels by water providers to their customers were also included. Other amendments passed in 1996 included financial assistance to communities attempting to upgrade or replace existing water treatment facilities and train and certify water treatment plant operators. The 1996 amendments also granted states the authority to require public water suppliers with over 10,000 customers to annually disclose the levels of contaminants in public water.

The Safe Drinking Water Act is important in that it not only protects the water humans consume directly, but also water used for agriculture and the production of livestock. The identification and control of NPS is a major consideration in attaining the standards set by the EPA to ensure the quality of water used for drinking and agricultural purposes.

Additional Information on Safe Water Drinking Act - 25 Years of the Safe Drinking Water Act: History and Trends can be found at <http://www.epa.gov/safewater/sdwa/trends.html>.

COASTAL ZONE ACT ([HTTP://WWW.EPA.GOV/OWOW/NPS/CZMACT.HTML](http://www.epa.gov/owow/nps/czmaact.html))

In 1990, under the Authority of Section 6217(g) of the Coastal Zone Act Reauthorization Amendments (CZARA), the EPA issued **Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters** (<http://www.epa.gov/owow/nps/MMGI/>). This document is intended to serve as a compilation of technical measures that states should include in their coastal NPS control programs.

The management measures outlined therein are not designed to replace existing programs, but rather to compliment existing programs through updated technical documentation and the introduction of newly developed management measures. Management measures are defined in the CZARA as:

economically achievable measures for the control of ... nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. [Section 6217(g)(5)]

The guidance provided is an attempt to focus on nonpoint sources that are regarded as large contributors to reduced water quality in coastal areas. The management measures apply to five main sources of NPS that threaten water quality throughout the nation. The five main sources are:

- Agricultural runoff
- Urban runoff
- Forestry (silviculture) runoff
- Marinas and recreational boating
- Hydromodification (channelization and channel modifications, dams, and streambank and shoreline erosion)

Management measures are also included for wetlands, vegetated treatment systems, and riparian areas as applicable to NPS. The EPA has recognized that the most effective means of controlling NPS include measures aimed at controlling point source pollution as well. The overlap between point and nonpoint sources is substantial in many instances.

FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT (FIFRA) ([HTTP://WWW.EPA.GOV/REGION5/DEFS/HTML/FIFRA.HTM](http://www.epa.gov/region5/defs/html/fifra.htm))

Also passed in 1972, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) provides for the control of the distribution, sale, and use of pesticides. Enforcement is accomplished through the regulations requiring users of pesticides to register at the time of purchase. Amendments to the law now require that persons applying pesticides be certified to reduce accidents and misuses that may result in increased NPS.

State Agencies With Water Resources Regulatory Authority Affecting Nonpoint Sources

DEPARTMENT OF STATE ([HTTP://WWW.DOS.STATE.NY.US](http://www.dos.state.ny.us))

The NYDOS, Division of Coastal Resources provides financial and technical assistance and promotes initiatives at the local, regional, and state level to protect and enhance the coastal ecosystems and economies of New York State. A large portion of the funding for the RPP is funded through the NYDOS, Division of Coastal Resources' Local Waterfront Revitalization Program. Technical assistance includes information and data on programs including CZARA, GIS data, and land use.

The NYDOS has a tremendous influence on land use regulation in New York State. While New York is a "home rule" state, the enabling legislation for the development of land use regulations and the process for developing, implementing, and appealing decisions based on them is the product of the NYSDOS.

DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) ([HTTP://WWW.DEC.STATE.NY.US](http://www.dec.state.ny.us))

NYSDEC is charged with conserving, improving, and protecting natural resources and the environment, and controlling water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well being. The NYSDEC attempts to reduce NPS through a number of activities including technical assistance for prevention, education, and monitoring and financial assistance for demonstration programs, improvement of existing facilities, and the construction of new ones.

The NYSDEC provides technical assistance and funding for programs aimed at preventing NPS through watershed management, dissemination of resources on best management practices, water quality monitoring, and assessing waterbodies throughout the state.

The New York Environmental Conservation Law (NYECL) contains several provisions relating to the implementation, monitoring, and enforcement of measures aimed at eliminating or reducing NPS. The NYECL establishes enforcement of penalties pertaining to the discharge of matter if such discharge violates the standards set in section 17-0101 regarding water quality and the endangerment of fisheries set in sections 17-0503, 11-1301 (1)(a), 71-01-919 (1)(b), 71-0923, and 71-0925.

Unified Watershed Assessments and Watershed Protection and Restoration Strategies

The NYSDEC has developed the Unified Watershed Assessments (UWA) (<http://www.dec.state.ny.us/website/dow/uwa/index.htm>) and Watershed Protection and Restoration Strategies (WRAPS) as a result of the federal Clean Water Action Plan (see Appendix P). Each of the watersheds within the state has been classified into one of four categories based on groundwater and surface water quality and impairments. The watersheds were then ranked according to the level of impairments and targeted for WRAPS and improvements based on these rankings.

Priority Waterbodies List (PWL)

Section 17-0301 of the New York Environmental Conservation Law (NYECL) establishes water quality standards and classifications of waterbodies in relation to these standards also known as the Priority Waterbodies List (PWL). Section 17-0101 requires “the use of all known available and reasonable methods to prevent and control the pollution of the waters of the state” to guarantee the quality of water in New York State waterbodies meets acceptable standards based on these classifications.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

The NYSDEC oversees implementation of the FIFRA.

State Environmental Quality Review Act (SEQR)

The State Environmental Quality Review Act (SEQR) (<http://www.dec.state.ny.us/website/dcs/seqr/index.html>) is a preventive measure that requires the completion of an Environmental Impact Assessment (EIA) and Environmental Impact Statement (EIS) for proposed state and local development. SEQR requires investigation into alternative actions and the mitigation of harmful effects of the proposed development. Potential NPS can be remediated through revised design or other measures.

State Pollution Discharge Elimination System (SPDES)

In NYS, NPDES permitting is under the purview of the NYSDEC, which issues a State Pollution Discharge Elimination System (SPDES) permit.

Neighbor Notification Law

The Neighbor Notification Law, formally known as Chapter 285 of the Laws of 2000, added Sections 33-1004 and 33-1005 the Environmental Conservation Law. These new sections add requirements for 48 hour notice to neighbors for certain commercial lawn applications, posting of visual notification markers for most residential lawn applications, providing notice to occupants of multiple dwellings and other occupied structures, and posting of an information sign by retailers who sell general use lawn pesticides. New regulations (6 NYCRR Part 325 Section 41) to implement the Neighbor Notification Law go into effect on March 1, 2001. The amendments to the Environmental Conservation Law and the new regulations are only effective in a County, or in New York City, that has adopted a local law to “opt into” the Neighbor Notification Law in its entirety and without any changes.

Additional Neighbor Notification Law Information can be found at <http://www.dec.state.ny.us/website/dshmp/pesticid/neighbor.htm>.

DEPARTMENT OF AGRICULTURE & MARKETS ([HTTP://WWW.AGMKT.STATE.NY.US](http://www.agmkt.state.ny.us))

In addition, the NYS Department of Agriculture and Markets provides administrative support to the State Soil & Water Conservation Committee (SWCC), which in turn provides guidance to the county Soil & Water Conservation Districts (SWCD). SWCD's receive guidance from the SWCC in administering the NYS Agricultural Nonpoint Source Abatement and Control Program and planning and implementing Agricultural Environmental Management (AEM) programs (see Appendix H). The Agricultural Nonpoint Source Abatement and Control Program funds the Graze New York Program that assists farmers in select counties to implement more intensive grazing, practices.

DEPARTMENT OF HEALTH ([HTTP://WWW.HEALTH.STATE.NY.US](http://www.health.state.ny.us))

The NYS Department of Health (DOH) monitors the impacts of NPS as it relates to the health of the citizens of New York through water quality monitoring and reporting programs. The New York Public Health Law includes statutes regulating the

protection of public water supplies from contaminants due to source and nonpoint source pollution including the enactment of Watershed Rules and Regulations (see Appendix R). The commissioner of the NYSDOH and commissioners of County DOH's determine violations and subsequent penalties.

The 1996 amendments to the SWDA require states to evaluate the quality of sources of public drinking water. Beginning in 1998 and continuing through 2001, the NYSDOH will administer the Source Water Assessment Program (SWAP) (<http://www.health.state.ny.us/nysdoh/water/swap.htm>) to aid local and state efforts to develop and implement strategies to protect drinking water supplies from both point and nonpoint source pollutants. Under the enabling legislation and the Source Water Assessment Program, the NYSDOH is responsible for overseeing public water supply supervision and wellhead protection among other programs.

Agricultural Programs

FARMLAND PROTECTION/AGRICULTURAL DISTRICTS PROGRAM (NYS)

One of the critical issues involved in land use planning decisions for agricultural uses is to ensure that agriculture protection deals primarily with the preservation of agriculture as an economic activity and not just as a use of open space. Traditionally, agricultural uses are part of large lot, low density, residential zoning districts. With increased residential development, however, conflicts between agricultural and residential uses have increased. Complaints about noise, odors, dust, chemicals, and slow-moving farm machinery may occupy enough of the resources of a farmer so as to have a negative impact on the viability of his or her farming activities.

Article 25-AA of the Agriculture and Markets Law is intended to conserve and protect agricultural land for agricultural production and as a valued natural and ecological resource. Under this statute, territory can be designated as an agricultural district. To be eligible for designation, an agricultural district must be certified by the county for participation in the State program. Once a district is designated, participating farmers within it can receive reduced property assessments and relief from local nuisance claims and certain forms of local regulation.

Agricultural district designation under Article 25-AA does not generally prescribe land uses. Under section 305-a of Article 25-AA, municipalities are, however, restricted from adopting regulations applicable to farm operations in agricultural districts which unreasonably restrict or regulate farm structures or practices, unless such regulations are directly related to the public health or safety (Agriculture & Markets Law, §305-a(1); Town Law §283-a; Village Law §7-739). The law also requires municipalities to evaluate and consider the possible impacts of certain projects on the functioning of nearby farms. Projects that require "agricultural data statements" include certain land subdivisions, site plans, special use permits, and use variances. Farm operations within agricultural districts also enjoy a measure of protection from proposals by municipalities to construct infrastructure such as water and sewer systems, which are intended to serve non-farm structures. Under Agriculture and Markets Law, §305, the municipality must file a notice of intent with both the State and the county in advance of such construction. The notice must detail the plans and the potential impact of the plans on agricultural operations. If, on review at either the county or State levels, the Commissioner of Agriculture and Markets determines that there would be an unreasonable adverse impact, he or she may issue an order delaying construction, and may hold a public hearing on the issue. If construction eventually goes forward, the municipality must make adequate documented findings that all adverse impacts on agriculture will be mitigated to the maximum extent practicable. "Right-to-farm" is a term that has gained widespread recognition in the State's rural areas within the past several decades. Section 308 of the Agriculture and Markets Law grants protection from nuisance lawsuits to farm operators within agricultural districts or on land outside a district which is subject to an agricultural assessment under section 306 of the Law. The protection is granted to the operator for any farm activity which the Commissioner has determined to be a "sound agricultural practice." Locally, many rural municipalities have used their home rule power to adopt local "right-to-farm" laws. These local laws commonly grant particular land-use rights to farm owners and restrict activities on neighboring non-farm land which might interfere with agricultural practices.

ENVIRONMENTAL QUALITY INCENTIVES PROGRAM (EQIP)

The Environmental Quality Incentives Program (EQIP) is a USDA-NRCS initiative authorized by the 1996 Farm Bill that provides farmers with technical, financial, and educational assistance to address soil, water, and natural resource concerns in an environmentally beneficial and cost-effective manner. A conservation plan is required to receive EQIP funding. EQIP addresses natural resource concerns through the implementation of structural, vegetative, and land use practices such as manure management facilities, abandoned well capping, tree planting, filter strips, nutrient, pest, and grazing management, and wildlife habitat protection and enhancement. Agricultural producers enter into five-to-ten year contracts with federal funding limited to \$10,000 per year with a maximum of \$50,000 for the total contract.

Additional Environmental Quality Incentives Program (EQIP) Information can be found at
<http://www.nh.nrcs.usda.gov/PROGRAMS/COD/cit/eqipsmry.htm>.

AGRICULTURAL ENVIRONMENTAL MANAGEMENT (AEM)

Agricultural Environmental Management (AEM) is a program to assist farmers in identifying environmental issues on their farms and implementing measures to maintain their economic viability while simultaneously protecting natural resources. Farmers voluntarily enter into these partnerships and remain the primary decision-maker throughout the AEM process. The AEM program focuses on helping farmers comply with federal, state and local regulations relating to water quality and other environmental concerns. The NRCS and County Soil and Water Conservation Districts coordinate the program.

AEM is designed to provide a system for planning and implementing environmentally suitable farming practices through the following steps or tiers:

- Tier 1 – Farmers complete a survey that includes questions regarding current farm activities, future activities or plans, and areas of possible environmental concern. Where no concerns are identified, the AEM process ends and the farmer's good stewardship is documented.
- Tier 2 – Areas for environmental concern identified in the Tier 1 survey are further detailed through the completion of a corresponding worksheet. Technical assistance in completing the worksheet is often provided by a local agricultural agency. Through the worksheet, the need for a management plan is determined. If the related environmental concerns can be easily remedied the farmer's good stewardship is documented and the AEM process ends.
- Tier 3 – A plan to remedy the specific environmental concerns identified in Tiers 1 and 2 is developed and completed. The plan takes into account the economic concerns of the farmer as well as environmental concerns resulting from current agricultural processes. Existing waste management, nutrient management, and conservation plans may be included in the AEM plan.
- Tier 4 – The plan developed in Tier 3 is implemented through Best Management Practices (BMPs) to reduce nonpoint source pollution. Agricultural agency staff provide technical, educational, and (when available) financial assistance to farmers in implementing these BMPs.
- Tier 5 – On-going evaluation of the AEM program at the individual farm, county, watershed, and state level is conducted to insure that environmental concerns related to nonpoint source pollution and the economic viability of agriculture production are addressed.

Additional Agricultural Environmental Management (AEM) information can be found at
<http://www.agmkt.state.ny.us/soilwater/AEM.html>.

ANIMAL FEEDING OPERATIONS

Animal Feeding Operation (AFO) means a lot or facility (other than an aquatic animal production facility) where animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and the animal confinement areas do not sustain crops, vegetation, forage growth, or post-harvest residues in the normal growing season. Two or more animal feeding operations under common ownership are a single animal feeding operation if they physically adjoin each other, or if they use a common area or system for the disposal of wastes.

AFOs include Concentrated Animal Feeding Operations (CAFO). CAFOs are point sources of pollution under the National Pollution Discharge Elimination System (NPDES) and are regulated under Section 301 of the CWA. CAFO General Permit GP-99-01 is a single permit that covers all CAFOs (who apply for coverage) Statewide. Therefore, all CAFOs who are covered by General Permit GP-99-01 will have identical permit language and requirements. Unique facility-specific requirements will be detailed in the Agricultural Waste Management Plan, a requirement for all CAFOs.

CAFO definitions and additional Animal Feeding Operation (AFO) information can be found at
<http://www.epa.gov/owmitnet/afo.htm>.

CONSERVATION RESERVE ENHANCEMENT PROGRAM (CREP)

The Conservation Reserve Enhancement Program (CREP) is a State-federal conservation partnership program targeted to address specific State and nationally significant water quality, soil erosion and wildlife habitat issues related to agricultural use. The program uses financial incentives to encourage farmers and ranchers to voluntarily enroll in contracts of 10 to 15 years in duration to remove lands from agricultural production. This community-based conservation program provides a flexible design of conservation practices and financial incentives to address environmental issues.

Additional Conservation Reserve Enhancement Program (CREP) information can be found at
http://www.fsa.usda.gov/dafp/cepd/crep/fact_sheet.htm.

WILDLIFE HABITAT INCENTIVES PROGRAM (WHIP)

The Wildlife Habitat Incentives Program (WHIP) is a voluntary program for people who want to develop and improve wildlife habitat primarily on private lands. It provides both technical assistance and cost-share payments to help establish and improve fish and wildlife habitat. Participants who own or control land agree to prepare and implement a wildlife habitat development plan. The U.S. Department of Agriculture's (USDA) Natural Resources

Conservation Service (NRCS) offers participants technical and financial assistance for the establishment of wildlife habitat development practices. In addition, if the landowner agrees, cooperating State wildlife agencies and nonprofit or private organizations may provide expertise or additional funding to help complete a project.

Additional Wildlife Habitat Incentives Program (WHIP) information can be found at
<http://www.nhq.nrcs.usda.gov/PROGRAMS/wwd/whipindex.htm>.

APPENDIX 8: CAPITAL IMPROVEMENTS PLAN

CAPITAL IMPROVEMENTS PLAN					
Project	Private/ Public	Cost	Sources of Funding	Sources for Technical Services	Phasing
Establish local walleye rearing ponds in cooperation with DEC fisheries program (if results of feasibility study support proceeding with this effort).	Public	To be determined	Grants	NYSDEC, Academic Institutions, Private consultants	Feasibility study, Identify pond cooperators; initiate stocking 2005
Develop sites for regional stormwater detention/ treatment areas in cooperation with NYSDEC and other stakeholders.	Public	>>\$100K per facility	Grants	NYSDEC, ACOE	Initiate feasibility studies by 2004
Ongoing program to improve wastewater collection and treatment infrastructure	Public	>\$1M	Bond Act, State Revolving Loan Fund (NYS Environmental Facilities Corp)	LCWSA	Ongoing
Install pumpout facilities for boats in areas with easy access.	Public	<\$20K	Clean Vessel Act grants	NYSOPRHP, Private contractors	Operational by June 2005
Winterize facilities at the State boat launch on East Lake Rd. and Long Point Park (T. Geneseo) to permit year-round use of public toilets.	Public	<\$20K	Grants	Private contractor	Completed by Jan. 2005
Identify and develop alternate water supply for residential users drawing pre-filtered (non-potable) water from Village of Avon.	Public	To be determined	Bond Act, State Revolving Loan Fund (NYS Environmental Facilities Corp)	LCWSA, NYSDEC	Initiate feasibility studies by June 2003
Develop interconnections and redundancy of public water supplies.	Public	To be determined	Bond Act, State Revolving Loan Fund (NYS Environmental Facilities Corp)	LCWSA	Initiate feasibility studies June 2003
Repair road ditches identified in 2001 field surveys (Map 5-2)	Public	\$190K per mile	Grants	County and Municipal Highway Departments	Initiate 2003
Restore/stabilize streambanks identified in 2001-2002 field surveys (Map 5-1)	Public	\$160K to \$530K per mile	Grants	SWCD, CCE, NYSDEC	Initiate 2003
Establishment of agricultural BMPs	Public and Private	\$50K to \$100K per farm	AEM program grants USDA Foundations	SWCD, NRCS, FSA, CCE	On-going; target is to have 70% of all farms participating in AEM program by 2005
Extend sewer system to areas show on Sewer System Expansion Areas map (Map 5-1): • Dacula Shores • Conesus Hamlet • Scottsburg Hamlet • Cove areas between Conesus Lake and West/East Lake Roads • Along West Lake Road • Along East Lake Road	Private	>\$1M	Bond Act, State Revolving Loan Fund (NYS Environmental Facilities Corp)	LCWSA	Initiate design by Jan 2004; referendum by Sept. 2004
Purchase aquatic weed harvesters	Public and Private	>\$100K per harvester	Grants, Special Benefit District	Private contractors	Initiate Special Benefit District process by Aug. 2003

APPENDIX 9: CONESUS LAKE MONITORING PLAN

1. Introduction

This monitoring plan was designed to provide strategic information regarding the water quality and ecological status of Conesus Lake. Measuring various physical, chemical, and biological attributes of the lake and its watershed can help stakeholders assess progress towards water quality and resource goals. Information resulting from a well-designed water quality monitoring program may also be used to evaluate the effectiveness of specific controls on nonpoint sources of pollution.

The monitoring program will be revised as the Watershed Management Plan is developed. The watershed characterization will identify specific parameters and areas of concern. Data gaps will be determined through this process. It is anticipated that an annual monitoring program will be an important mechanism for addressing these data gaps.

Water quality and ecological conditions in Conesus Lake are the result of complex interactions between the lake and its watershed. Physical factors such as hydrologic inflows and stratification are important forcing functions, and are closely coupled to chemical water quality. The biological community both responds to and alters the physical and chemical environment. Consequently, this monitoring program takes an ecosystem approach.

Four principles guided development of this monitoring program.

(1) Turn Data into Information, then into Strategic Information.

This evolution is a central attribute of any effective monitoring program. Data are results of individual measurements of the physical, chemical, and biological parameters of the system. For example, results of biweekly monitoring of water temperature, dissolved oxygen, total phosphorus, and chlorophyll-*a* are data.

Data become information when they are compiled and used to test a conceptual framework of the nature of the aquatic system. Temperature and oxygen data can help define stratification and rates of hypolimnetic oxygen depletion; chlorophyll data indicate the abundance of phytoplankton. Phosphorus accumulation in the lower waters and depletion in the upper waters over the stratified period helps managers assess the lake's trophic state. Measured results can be compared to a desired state of the ecosystem. For those parameters with criteria or standards, comparison between measured results (data) and the criteria or standards becomes information.

Information becomes strategic information when it provides a basis for informed decision making. The relative loading of phosphorus and sediment from certain tributaries can help define priority areas for remedial action. Another example is trend analysis. Data from a well-deigned monitoring program can be used to determine whether water quality conditions (for example, water clarity or phosphorus concentrations) or biological conditions (for example, macrophyte growth and zebra mussel density) are changing over time.

In order for data gathered during a monitoring program to support management decisions, the water quality monitoring program must be thought of as serving a series of testable hypotheses relevant to specific objectives for the resource. The spatial and temporal frequency of measurements must be adequate, given the inherent variability in parameters, to distinguish real trends from noise.

(2) Incorporate a quality assurance/quality control (QA/QC) program to document data quality and estimate sampling and analytical sources of variability.

A QA/QC program is a systematic program of planning for and documenting the integrity of the procedures used to collect and analyze samples. It can be expanded to assess the processes used for data management as well. With multiple agencies involved in monitoring, a QA/QC program allows managers to assess comparability of data sets and determine the extent to which system-wide comparisons can be drawn. A QA/QC program is especially important for citizen monitoring. When volunteer programs include a formal QA/QC program, the utility of the information generated is greatly enhanced.

A program of replicate samples, split samples, and audit samples is needed to identify sources of variability in data, and provide feedback to the participating agencies regarding the need to revise their procedures. For trend analysis to be performed, it is essential to be able to identify and quantify sources of variability in the data. Participating laboratories should use standard methods for analysis and document their procedures.

(3) Include "capstone indicators," organisms that, by their presence or absence, provide information regarding the ecological status of the community.

The communities of plants and animals present in Conesus Lake are adapted to ambient conditions of light, nutrients, temperature, sediments, etc. While it is essential to monitor these physical and chemical conditions, the community composition and abundance of the biological communities can provide valuable information. In many respects, public

perception of water quality conditions reflects the status of biological communities such as fish, macrophytes, and zebra mussels.

In addition to characterizing the biological community, the presence and abundance of single populations can provide important information regarding overall water quality conditions. Key indicator species may be of high value as an economic/recreational resource, such as sport fishes. Other indicator species, such as native macrophytes, may be selected because of their importance in providing habitat. Other criteria for indicator species include their relative susceptibility or tolerance to adverse water quality conditions, their ease in measurement, and whether density of the organism is correlated with extent of contamination.

(4) Strive to be cost effective

Monitoring is expensive. A well-designed monitoring program will eliminate any redundancies and increase the value of the overall investment in monitoring. Opportunities to use volunteers from the Conesus Lake Association and other sources should be explored. The resources of the local universities should be utilized as much as possible.

The scope of this baseline monitoring program was designed based on an annual funding level of \$15,000 to \$18,000. If supplemental funding is received, additional tasks can be incorporated into this framework.

2. Approach

The monitoring program outlined in this document reflects specific objectives for Conesus Lake developed through two scoping sessions conducted in June 1999. The effectiveness of existing monitoring programs were examined, areas were identified where additional monitoring would be required.

The monitoring program is based on a three-year cycle of limnological sampling. This return frequency for lake water quality monitoring was selected based on the baseline information of Dr. Makarewicz and his group at SUNY Brockport. As described below, there are annual monitoring programs in place that would supplement the data set with measurements of key parameters including total phosphorus and chlorophyll-*a*. The three-year cycle provides an opportunity to conduct watershed-focused monitoring and pursue issues of concern in greater detail during the other years.

The focus of this program is on surface water resources, Conesus Lake and its tributaries. Groundwater is an important component of the watershed as well. Many watershed residents draw water from private wells, and maintaining the quality of the supply is an important issue for public health and economic viability of the region. Coordination with existing groundwater protection and/or monitoring programs should be considered as resources become available.

3. Summary of Objectives

Based on the results of the scoping session, objectives for Conesus Lake reflect both human and ecological perspectives; human use and enjoyment are balanced with maintenance and enhancement of the lake's chemical, physical, and biological quality. Specific objectives are grouped into four main categories, as listed below.

A. Use attainment

- (1) Assess suitability of Conesus Lake for primary contact recreation and water supply.
- (2) Assess groundwater quality.

B. Trend analysis

- (1) Collect data that will support an analysis of the lake's trophic status.
- (2) Measure concentrations of major anions and cations.
- (3) Map macrophyte density.
- (4) Map macroalgae in littoral zone.
- (5) Estimate abundance of zebra mussels.

C. Ecosystem functioning

- (1) Analyze species composition of macrophyte community.
- (2) Analyze size composition of phytoplankton and zooplankton communities.
- (3) Evaluate species composition of fish community.

D. Sources

- (1) Confirm estimates of concentration and loading of TP and TSS from subwatersheds.
- (2) Identify specific agricultural parcels that are sources of bacteria, nutrients, and/or sediment.
- (3) Determine importance of roadside ditches in contributing TSS and TP to lake.
- (4) Confirm suspected sources with upstream/downstream sampling (stressed stream analysis).
- (5) Confirm elevated sodium and chloride inputs from Hanna's Creek and Wilkins Creek.

- (6) Determine the effects of boating on lake.
- (7) Evaluate whether sewers (especially sewer laterals) are leaking.
- (8) Evaluate effectiveness of on-site wastewater disposal systems and whether hillside systems contribute nutrients, salts, and microorganisms to lake.
- (9) Evaluate effectiveness of best management practices on stream and lake water quality.

4. Examples of Hypotheses Related to the Objectives

The monitoring program has been formulated as a series of testable hypotheses reflecting specific management objectives. This framework focuses monitoring on key variables and enables managers to interpret results of the monitoring program in an unambiguous manner. Framing these questions as null hypotheses helps ensure that sufficient information and the right type of information are developed in the monitoring program.

CATEGORY: LOADING AND SOURCES

Hypothesis: Loading of suspended solids, nutrients and salts to Conesus Lake from the watershed is not significantly different in 2001 - 2002 as compared to baseline estimates in 1990 - 1991.

Discussion: External loading of materials will ultimately define the water quality conditions of Conesus Lake. Without a water quality model that quantifies the linkage between inputs, concentration, and water quality conditions, there is no basis for estimating the reduction in loading needed to reach a desired state. We consequently express this hypothesis in terms of change from baseline conditions.

Hypothesis: All subwatersheds contribute nutrients, salts, pathogens, pesticides, and suspended sediment in amounts proportional to their hydrologic contribution.

Discussion: Watershed and tributary monitoring can define problem areas, where loading is disproportionate to hydrology. Moreover, streams with elevated loading can be assessed using segment analysis to help pinpoint problem areas.

Hypothesis: Implementation of storm water management practices in the watershed has reduced loading of suspended solids, phosphorus, and pathogens.

Discussion: Monitoring the effectiveness of specific controls will enable managers to identify priority subwatersheds and develop a database of best management practices most effective in this specific environment.

Hypothesis: Sewer lines and laterals leak wastewater to the groundwater and ultimately to the lake.

Discussion: The community has expressed this concern.

Hypothesis: Intermittent sources such as rivulets and roadway runoff contribute phosphorus and suspended sediment to the lake in amounts disproportionate to their hydrologic input.

Discussion: Several individuals have raised this issue, including the Watershed Inspector and Dr. Makarewicz. By framing the hypothesis in this manner the need for estimating flow from these sources is clear.

CATEGORY: LAKE WATER QUALITY

Hypothesis: There is no trend in the trophic status indicator parameters measured in the open waters of Conesus Lake (total phosphorus, Secchi disk transparency, chlorophyll-*a*, dissolved oxygen depletion rate).

Discussion: These are important variables for tracking lake water quality. A good historical database is available (1972, every 3 years from 1985 to present, annual 1997-present)

Hypothesis: The shoreline area and duration of swimming beach closure due to the presence of pathogen indicators has decreased (indicating improved water quality).

Discussion: This is a key variable from the perspective of use attainability.

Hypothesis: There is no trend in concentration of sodium and chloride in Conesus Lake.

Discussion: Existing data suggest that concentrations of dissolved salts are increasing (additional analysis will be presented in the watershed characterization report).

Hypothesis: There is no trend in concentration of nitrate N in Conesus Lake

Discussion: This is another important indicator of water quality and nutrient status.

CATEGORY: ECOSYSTEM FUNCTIONING

Hypothesis: The areal coverage of rooted aquatic plants (macrophytes) has not changed

Discussion: Macrophytes are an indicator of overall water quality conditions, particularly light penetration, and play an important role in ecosystem processing of energy and materials. They are a key element in public perception of lake water quality conditions. Good baseline data exist from 1990 and 1999. New GPS technology will facilitate quantitative lakewide mapping.

Hypothesis: The species composition of the algal community has not changed (potential metrics include number of

species, diversity, average biovolume/size, or dominance by taxa or growth form).

Discussion: Excellent baseline data exist, beginning with Dr. Ed Mills' 1972 thesis and carried through 1985 - present every 3 years by Dr. Makarewicz's group. Phytoplankton data supplement the routine chlorophyll monitoring and complement the zooplankton monitoring data.

Hypothesis: The average size of organisms comprising the zooplankton community and/or the dominant taxa of zooplankton has not changed.

Discussion: Similar to the phytoplankton, excellent baseline data exist describing the lake's zooplankton community. This component of the ecosystem is an important moderator between trophic levels (fish and phytoplankton).

Hypothesis: The population of alewife has not changed.

Discussion: This fish was selected to represent some of the complexity in the Conesus Lake ecosystem. The population of alewife is controlled by predator fish (such as walleye) and directly affects the abundance and size distribution of the zooplankton community.

Hypothesis: The abundance of macroalgae in the lake's littoral zone has not changed.

Discussion: Recent observations and reports suggest that the abundance of macroalgae (species unknown) in the littoral zone is increasing. Specific coves are most affected.

Hypothesis: Density of adult zebra mussels in the lake has not changed.

Discussion: This invasive organism has been present in Conesus Lake for several years. They are implicated in many ecological and water quality changes. Tracking the status of the adult mussel community will enable managers to determine when (if ever) the population is stable and determine the extent to which mussel density is correlated with water quality impacts.

5. *Summary of Existing Programs*

A number of agencies and University scientists conduct research or monitoring in the Conesus Lake watershed. Each program is designed to meet specific objectives. Based on information reviewed, the following programs are in place.

- USGS/NYSDEC low-level pesticide monitoring
- Lake level measurement and recording
- NYSDEC (Albany) synoptic surveys of Finger Lakes
- NYSDEC (Region 8) surveys of western Finger Lakes for specific parameters related to zebra mussels
- Required monitoring by water suppliers (Avon, Geneseo)
- NYSDEC fish surveys and stocking records.
- NYSDOH fish contaminant monitoring
- Monitoring at private camps, campgrounds, and public beaches
- Livingston County Health Dept. watershed inspector testing for nonpoint sources.
- Dr. Joseph Makarewicz (SUNY Brockport) limnological surveys every 3 years, 1985 - present.
- Dr. Ken Stewart (SUNY Buffalo) water temperature and ice cover data.
- Dr. Sid Bosch (SUNY Geneseo) macrophyte mapping

The objectives and scope of these monitoring programs are outlined in Table A-1. Other scientists at SUNY Geneseo, SUNY Brockport, and the University of Buffalo conduct research on the lake and its watershed. Findings of research activities can affect design of an ambient monitoring program by highlighting priority areas or identifying organisms that are valuable indicators of ecosystem structure and function.

Table A-1 Summary of Existing Monitoring Programs, Conesus Lake Watershed

Program	Statewide pesticide monitoring *	Water supply monitoring	Finger Lakes limnological surveys	Western Finger Lakes limnological surveys
Lead agency/ cooperating agency	USGS NAWQA	Water purveyors (Geneseo and Avon)	NYSDEC (Central office)	NYSDEC (Region 8)
Objective	Synoptic surveys of pesticides in water of 11 Finger Lakes	Monitor quality of public water supply	Trophic status assessment	Impact of zebra mussels
Monitoring Parameters	47 pesticides	NYSDOH Part 5 list: Analysis by certified contract laboratories	TP,N species, major ions, DO, Chlorophyll- <i>a</i> Secchi disk, pH, temperature, conductivity	Chlorophyll- <i>a</i> , zooplankton, Secchi disk, temperature, DO, pH, conductivity profiles <i>Ca (August only)</i>
Locations	South basin Lat. 42 48 56 Long 77 42 22	Water intakes	South basin Lat. 42 45 37 Long 77 42 50	One station (deep hole, southern lake basin)
Depths	Surface dip	Geneseo: 48 ft., Avon: 18 ft.	Epilimnion and hypolimnion (profiles of field parameters)	Chlorophyll: tube sample through photic zone, field parameters profiles, zooplankton epilimnetic tow
Frequency	One sample per year (program not ongoing)	As required	Monthly, May - October	Monthly, April or May - October
Years of Record	1997 and 1998	1985 - present	1997 - present	1995 - present
Comments	Low level analytical techniques	V. Avon in compliance Oct 1998	Future of this program is uncertain	Standard protocol for 7 Finger Lakes (Seneca and west)
Contact	Pat Philips USGS, Troy	James Mazurowski LCOH	Cliff Callinan NYSDEC Albany	Web Piersall NYSDEC Avon
*USGS and NYSDEC have added Conesus Lake to the statewide low level pesticide assessment program. Samples are collected at the Town of Avon and Village of Geneseo water intakes (raw water). Both intakes will be sampled in May and July 2000 and again in January 2001. One intake will be selected for continued long-term monitoring (three times per year).				

6. Additional Monitoring Needs/Gap Analysis

The programs outlined in Table A-1 provide a great deal of information that can be used to characterize Conesus Lake. However, additional data collection efforts are needed to assess use attainment, establish trends, evaluate ecosystem functioning, and identify specific sources of contaminants.

Table A-2 is a summary of this gap analysis. These are additional monitoring and assessment needs that would provide data needed for the broader assessment and to test the specific hypotheses outlined above. The elements in Table A-2 are incorporated into the recommended monitoring plan, either as baseline activities or special projects.

Table A-2 Gap Analysis

Objective	Data Needs	Existing Program	Gaps
LAKE WATER QUALITY ISSUES			
Use attainment	Secchi disk transparency (swimming)	Monthly, single mid-lake station. Every 3 years, biweekly at one station	Additional locations and frequency for swimming use
	Drinking water quality	Avon and Geneseo required monitoring	Low level pesticides
	Indicator bacteria	At intakes, occasional nearshore	Additional nearshore
Trend analysis (trophic status)	Total P	NYSDEC, monthly	Existing DEC program adequate but status is uncertain.
	NO3-N	Brockport: biweekly, every 3 years	Brockport program adequate.
	Secchi disk transparency (trophic state)	Monthly, single mid-lake station Brockport: biweekly, every 3 years	Existing program adequate, could increase frequency to biweekly during summer and add station in north
	Chlorophyll-a	NYSDEC, monthly (2 programs) Brockport: biweekly, every 3 years	Existing program adequate, add QC
	Dissolved oxygen depletion rate	NYSDEC, monthly profiles (2 programs) Brockport: biweekly, every 3 years	Existing programs adequate Add north basin
Trend analysis (dissolved salts)	Sodium, Potassium Calcium, Magnesium Chloride, Sulfate Total alkalinity	NYSDEC, monthly Brockport: every 3 years: Na, Ca, Mg, K, biweekly	Future of DEC program uncertain. Recommend Brockport add anions (Cl, SO4)
Trend analysis (zebra mussels)	Colonization rate Estimated density	None, veligers are present in zooplankton samples but not separately reported	Only anecdotal / qualitative information regarding status of zebra mussel population
Trend analysis and ecosystem (macrophytes)	Total vegetated area (% of littoral) Species richness Density in reference areas Maximum depth of plant growth Percent exotics	1999 assessment by SUNY can serve as baseline. NYSDEC observes macrophytes, no systematic assessment.	Need for annual program
Ecosystem: Zooplankton size structure	Annual DEC: Numbers, taxa, and size of organisms Every 3 years: ID, counts, size (SUNY)	DEC data summarized into single value (average size)	Data evaluation and reporting
Ecosystem: macroalgae	Abundance and species composition	None	Need baseline monitoring program
Ecosystem: Fish community	Numbers, species, size, contaminant burden	NYSDEC 3-4 year rotating assessment	Adequate
Impact of boating on lake	Secchi disk transparency	Not targeted to address this concern	Additional frequency and locations needed
TRIBUTARY (WATERSHED) ISSUES			
Identify / confirm potential nonpoint sources in watershed	TP, TSS, TN, Sodium, Chloride Coliform bacteria	Baseline data from SUNY (stressed stream analysis). Watershed inspector	Additional TP, TN and TSS measurements needed
GROUNDWATER ISSUES			
Potential for leaking sewer lines/laterals	Smoke testing or other means to verify integrity of system	None (response to specific complaints)	Public perception of problem, no documentation

Recommended Program (baseline or special)	Monitoring Location and Depths	Frequency and Duration	Comment
Baseline	Nearshore, Through water column	Weekly, June 1 – Sept. 30	Opportunity for volunteer monitoring
Special	At water intake (Geneseo 45 ft)	At least monthly	Coordinate with USGS, request to be added as a fixed site to statewide monitoring network
Baseline	Swimming areas, Sample at water depths 3 – 4 ft.	5 samples/month June - August	Recreational suitability
Baseline	Deepest portion of lake (south basin) 1 m 15 m (TP only)	Monthly, April – October	Use EPA proposed nutrient criteria for lakes (TP, TN, Chlorophyll- <i>a</i> , Secchi)
Baseline	South basin North basin	Monthly, April, May, October Biweekly June - September	Include profiles of dissolved oxygen (DO), temperature, pH, specific conductance
Baseline	South basin	Monthly, April – October	Add hypolimnetic TP
Baseline	South basin, deepest portion of lake Add north basin	biweekly April – fall mixing	(sample at 15 m)
Baseline (every 3 years is adequate)	South basin, 1 m and 15 m samples Brockport: north station, recommend adding south	Twice each year, May and October	Charge balance also checks data quality
Baseline	Establish 6 monitoring sites. Deploy standard substrates. Retrieve and count mussels.	Deploy prior to June, retrieve in September	Possible volunteer activity with technical training and oversight.
Baseline	Lakewide (littoral zone survey) supplemented with more intensive sampling at: selected coves and inlets	Annual surveys, July-Aug GPS surveys to produce quantitative maps	Reference areas as established by SUNY program
Baseline (every 3 years is adequate) Recommend adding south station	North and South station	Monthly, April or May through October	Coordinate with SUNY Brockport
Baseline	Littoral zone, focus on coves	Monthly, June – Sept.	Need method development
Baseline (not annual)	lakewide	Project specific	Status of alewife important link to zooplankton and clarity
Special	Nearshore	Daily, May 15 - Sept. 15	Is water clarity lower after heavy weekend boating? Potential opportunity for volunteer monitoring
Special (designed based on specific problems)	Upstream / downstream of potential sources. Or, before and after BMPs implemented	Project specific. Sampling should target storm flow conditions.	Specific recommendations to follow as watershed characterization progresses.
Special	Throughout sewer area	Will require phased effort, coordinate with Director of Public Works, Conesus Lake County Sewer District	Video surveillance has been done, no data on laterals.

The use attainment objective encompasses water quality conditions that support the lake's use for water supply and recreation. Nearshore Secchi disk transparency measurements are recommended to assess recreational quality from the shoreline. Monitoring for indicator bacteria is also recommended.

A statewide assessment of pesticides in surface waters has been underway in New York since 1997. The program monitors water samples from nested watersheds, for example, tributaries to a lake, the lake itself, and a downstream river into which the lake discharges. The program is a cooperative effort of USGS and NYSDEC. Pesticide concentrations in water intakes of other public water supply lakes are included in the program (Cayuga Lake, Skaneateles Lake, Hemlock Lake, Lake Ontario, Lake Erie, LeRoy Reservoir, Hornell Reservoir, and Silver Lake). Conesus Lake would be an excellent addition to the western NY portion of the statewide pesticide-monitoring network. USGS and the DEC have recently agreed to add Conesus Lake to the statewide low level pesticide assessment program. Samples are collected at the Town of Avon and Village of Geneseo water intakes (raw water). Both intakes were sampled in May and July 2000 and January 2001. One intake will be selected for continued long-term monitoring (three times per year).

The selected parameters for trophic state include both causal parameters (total P and Nitrate-N) and response parameters (chlorophyll-*a*, Secchi disk transparency, and dissolved oxygen profiles). We have used the draft EPA nutrient criteria for lakes and reservoirs as a basis for selecting the list of parameters to be monitored for trophic state.

Annual measurements of dissolved salts (major anions and cations) are included because of data that indicate increasing concentrations of sodium and chloride. These parameters are relatively conservative and measurements twice each year should be adequate.

Zebra mussel monitoring in the littoral zone is recommended. According to Dr. Sid Bosch, zebra mussels have colonized the entire littoral zone of Conesus Lake to a water depth of approximately 10 m. Monitoring will include diving and harvesting all mussels within standard quadrats in six locations around the lake.

The western Finger Lakes limnological surveys conducted by NYSDEC Region 8 includes monthly sampling and analysis of the zooplankton community. The SUNY Brockport program collects biweekly profiles every 3 years, and reports identifications, sizes, and counts. This program can provide a baseline for this element of the ecosystem monitoring and trend analysis.

A program element to assess the abundance and dominant species of macroalgae is recommended. Sampling along transects in defined areas of the lake is recommended.

Finally, NYSDEC Region 8 samples the fish community of Conesus Lake on a regular basis. Gill netting is conducted on a 3 - 4 year rotation. Early season electroshocking is conducted, as are occasional surveys for bass. There have also been high frequency hydroacoustical surveys completed to document the pelagic zone distribution of fishes such as the alewife.

7. Monitoring Program Design

Table A-3 summarizes the recommended sequence of monitoring activities. A three-year rotation is recommended.

Year 1	Year 2	Year 3
Baseline lake monitoring (Group A Parameters)	Baseline lake monitoring (Group A Parameters)	Baseline lake monitoring (Group A Parameters)
Watershed Inspector/ Health Department Analytical Allowance	Watershed Inspector/ Health Department Analytical Allowance	Watershed Inspector/ Health Department Analytical Allowance
Expanded lake monitoring (Group B Parameters)	Watershed monitoring: loading estimates*	Watershed monitoring: stress stream (segment) analysis *
*Details of the watershed monitoring program will be developed as part of the Conesus Lake Watershed Characterization Report.		

Certain monitoring programs recur each year, including baseline lake monitoring and sampling to support the watershed inspection program. Expanded monitoring alternates between the lake and the watershed. The parameters to be included in the baseline monitoring program (group A parameters) are summarized in Table A-4.

Table A-4 Summary of Group A Parameters Conesus Lake Monitoring Program

Parameter	Priority*	Frequency	Location	Depths	Samples	Comments
Secchi disk transparency (lakewide)	–	Annual Biweekly, May - Oct	South deep (primary site) North deep (recommended)	Through photic zone	11 - 12 rounds, 2 stations (22 - 24 observations)	Opportunity for lake association or other volunteers. Potential for training with CSLAP program
Secchi disk transparency (nearshore)	1	Annual Weekly	Nearshore areas (establish 8 standard locations)	Through photic zone	Weekly, June - August	See above
Dissolved oxygen, temperature, pH, conductivity	1	Annual Biweekly, May 1 - fall mixing	South deep North deep	At 0.5 m depth intervals	16 - 18	Opportunity for interagency cooperation
Indicator bacteria	2	Annual 5 times/month. June - August	At beaches and recreational sites (assume 4 stations established)	At 3 - 4 ft. water depth	60	Assumes testing for both E. coli and fecal coliforms
Zebra mussels	2	Annual	Reference sites	Littoral zone (less than 10 m depth)	6 sites	SUNY Geneseo
Macrophytes	2	Annual July - August	Reference sites	Littoral zone	6	SUNY Geneseo
Macroalgae	3	Annual July - August	Visual survey	Littoral zone	Variable	With macrophyte survey

*This parameter listing considers the programs of other agencies such as NYSDEC that monitor Conesus Lake. Priorities are based on the importance of the data and information collected to use attainment and the ecological status of the lake.

Intensive lake monitoring is recommended on a three-year return frequency. Monitoring every three years will provide detailed data consistent with the historical data collection program of Dr. Makarewicz, which will enable managers to detect trends in the lake's water quality and biology. These parameters are listed in Table A-5. Region 8 NYSDEC monitors certain trophic state parameters (total phosphorus, chlorophyll-*a*, Secchi disk transparency, dissolved oxygen and temperature profiles) on an annual basis. These annual data will complement the recommended monitoring program that is on a three-year rotation.

The recommendation to focus the monitoring effort on the southern basin of the lake is based on the comparative investigation conducted by Dr. Makarewicz in 2000, where samples were collected at three depths in each basin. The major difference between the two stations was related to the presence of an isolated hypolimnion in the southern (deeper) basin and the seasonal development of anoxic conditions (Makarewicz et al. 2001 a).

Table A-5 Summary of Group B Parameters Conesus Lake Monitoring Program

Parameter	Frequency	Location	Depths	Samples
Total P Biweekly May 1 - October 31	Every 3 years 45 analyses)	South deep	1 m, 7m, 15 m plus 10% QC (estimate.	13 events, three depths
Soluble Reactive P Biweekly May 1 - October 31	Every 3 years 45 analyses)	South deep	1 m, 7m, 15 m plus 10% QC (estimate.	13 events, three depths
Nitrate plus nitrite N	Every 3 years Biweekly May 1 - October 31	South deep	1m, 7m, 15 m	6 events, three depths plus 10% QC (estimate 20 samples)
Chlorophyll-a	Every 3 years Biweekly May 1 - October 31	South deep	Tube composite through photic zone	13 events plus 10% QC (estimate. 15 analyses)
Major anions and cations	Every 3 years Biweekly May 1 - October 31	South deep	1m, 7m, 15 m	6 samples for 7 analytes (Ca, Mg, K, Na, alkalinity, Cl, sulfate)
Macrophytes	Every 3 years July - August	Lakewide, plus six reference sites	Entire littoral zone	Many. GPS technology used to map beds
Macroalgae	Every 3 years July - August	Identify species, assess biomass along transects	Littoral zone	Variable
Zooplankton and phytoplankton	Every 3 years Biweekly, May - October	South deep tow/photic zone tube	Water column	13 events

Watershed monitoring to assess the loading of substances is recommended for one of the three years. Monitoring to estimate annual loads involves collecting grab samples from the streams and estimating streamflow. Paired concentration and flow data are used to estimate load. Collecting more samples provides a better estimate of annual load.

The distribution of samples with respect to the annual flow regime of the streams is also an important factor in improving the load estimate. Because many of the streams in the Conesus watershed drain small steeply sloped areas, high runoff following rain and snowmelt delivers most of the annual load of materials to the Lake. Frequent sampling during high flow events is therefore essential to minimize the standard error associated with the estimated loading.

There are 12 major streams flowing to Conesus Lake. Of these, the Inlet and North and South McMillan drain the largest subwatersheds and thus deliver the majority of the annual water inflow to the lake.

Based on loading estimates of Dr. Makarewicz in 1990 - 1991 these streams also deliver the majority of suspended solids and nutrients to the lake. Monitoring these streams is the highest priority. The relative priority of monitoring other streams will be assessed following completion of the Watershed Characterization Report.

In the third year, a focus on individual streams using a stressed stream or stream segment approach to monitoring is recommended. This monitoring approach focuses on an individual stream and tracks water quality impacts of specific land use and parcels by monitoring upstream and downstream of potential sources of contamination.

Additional details and recommendations for the stream segment monitoring will be developed based on the Watershed Characterization Report.

8. Cost Estimates and Priorities

New York State Environmental Protection Funds have been used to fund the Conesus Lake Aquatic Weeds Strategy (CLAWS). These funds have been directed to Livingston County through the Finger Lakes-Lake Ontario Watershed Protection Alliance (FL-LOWPA). The recommended monitoring program assumes that a significant portion of the CLAWS funds will be dedicated to this effort, and that approximately \$15,000 will be available each year. If additional sources of funding become available, other projects that address the list of specific hypotheses for this resource could be implemented.

For example, more intense monitoring of specific land uses or parcels within the watershed could be examined. These data would provide a foundation for before and after monitoring of the effectiveness of best management practices. Another issue that is of great concern to the community is the relative importance of nutrients in groundwater to the overall nutrient status of the lake.

Cost estimates for the various elements of the monitoring program are outlined in Table A-6. These estimates are preliminary, based on the continued participation of the University researchers and volunteer efforts of the Conesus Lake Association.

Table A-6 Cost Estimates Conesus Lake Monitoring Program Group A Parameters		
Parameter	Performed By	Cost Estimate
Secchi disk	CLA Volunteers	\$450 one-time cost for equipment
Field parameters (profiles of oxygen, temperature, pH, conductivity)	NYSDEC and SUNY Geneseo field students	\$500 allowance for equipment maintenance and calibration
Indicator bacteria	Livingston County Department of Health, Watershed Inspector	\$2,400 allowance for laboratory analytical services
Macrophytes and macroalgae: reference	SUNY Geneseo	\$1,000
Zebra mussel survey	SUNY Geneseo	\$1,000
Expanded Monitoring Program Group B Parameters		
Parameter	Performed By	Cost Estimate
Macrophyte and macroalgae survey	SUNY Geneseo	\$7,000 (lakewide survey, to be performed every 3 years)
Water chemistry and limnology	SUNY Brockport	\$5,000 (focused on south deep station)
Phytoplankton and zooplankton identification and enumeration	SUNY Brockport	\$2,500

APPENDIX 10: GLOSSARY OF TERMS AND ACRONYMS

Glossary

Alewife.	Small, non-native fish (<i>Alosa pseudoharengus</i>).
Alum.	Aluminum sulfate; a coagulant widely used in water treatment systems.
Anaerobic.	Without open air or oxygen.
Aquifer.	An underground layer of porous rock, sand, or gravel containing large amount of water. The term is usually restricted to those water-bearing structures capable of yielding water in sufficient quantity to constitute a usable supply.
Assay.	Qualitative or quantitative analysis of a substance, especially of an ore or drug, to determine its components. A substance to be so analyzed. The result of such an analysis.
Bathymetry.	Measurement of water depth at various places in a body of water.
Benthos.	All organisms living on or closely associated with the bottom of a body of water.
Bio-manipulation.	Technique used to restore eutrophied lakes, based on the active management of the food web.
Biomass.	Total mass (dry weight) of living matter within a given unit of environmental area.
Biota.	Plant and animal life of a region or ecosystem, as in a stream or other body of water.
Biotic.	Pertaining to life or living things, or caused by living organisms.
Check dam.	A small dam constructed in a gully or other small watercourse to decrease the streamflow velocity, minimize channel erosion, promote deposition of sediment, and to divert water from a channel.
Chlorophyll.	The green pigment of plants.
DO.	Dissolved oxygen.
Ecology.	The study of inter-relationships of living things to one another and to the environment.
Ecoregions.	Large scale assemblages of plant and animal communities that share a common environment.
Ecosystem.	A community of animals, plants, and bacteria, and its interrelated physical and chemical environment.
Electrofishing.	Electrofishing is a standard technique used by environmental biologists to sample fish populations in a lake. About eight feet ahead of the boat, an electric current is produced for short periods. Stunned fish are easily netted and placed in a holding tank. The fish are returned to the lake after they are weighed, measured for length, and identified. This data helps biologists determine if the growth of fish is normal and if the fish populations are at desirable levels.
Epilimnion.	Warm upper layer of a body of water.
Eurasian watermilfoil.	A rapidly growing aquatic plant that tends to create floating mats of vegetation (<i>Myriophyllum spicatum</i>).
Eutrophic.	Supporting high levels of plant and animal life; highly productive.
Fingerlings.	A young or small fish.
Fry.	Recently hatched fish.
G/ha/d.	Grams per hectare per day
Groundwater.	Generally, all subsurface water.
Heavy metals.	Those metals that have high density. These substances are considered toxic at specified concentrations.
Hydrologic budget.	An accounting of the inflow, outflow, and storage in a hydrologic unit, such as drainage basin, or lake.
Hydrology.	The study of the movement and storage of water in the natural and disturbed environment. The condition of the aquatic environment at some specified time and place.

Hydroseeding.	Dissemination of seed under pressure, in a water medium.
Hypolimnion.	The lowermost, non-circulating layer of cold water in a thermally stratified lake or reservoir.
Indicator organism.	An organism whose presence is a sign that certain environmental conditions exist.
Ion.	An electrically charged atom.
Kg/d.	Kilograms per day.
Kg/yr.	Kilograms per year.
Limnology.	The study of the physical, chemical, hydrological, and biological aspects of fresh water bodies.
Littoral zone.	That portion of a body of fresh water extending from the shoreline lakeward, up to the limit of occupancy of rooted plants.
Load.	The amount of material that a transporting agency, such as a stream, is actually carrying at any given time.
Loading.	The quantity of a substance (a contaminant) entering the receiving waters.
Macroalgae.	Multicellular algae; a large kind of algae.
Macroinvertebrates.	An animal without a backbone, large enough to see without magnification.
Macrophytes.	Plants in the aquatic environment, large enough to see without magnification.
Metabolite.	Substances produced from the breakdown or decomposition of other substances.
Metalimnion.	Middle layer of a thermally stratified lake. In this layer there is a rapid decrease in temperature with depth. (Also referred to as Thermocline.)
mgd.	Million gallons per day.
N.	Chemical symbol for nitrogen.
P.	Chemical symbol for phosphorus.
Pathogens.	Disease causing organisms.
Photosynthesis.	The process in green plants and certain other organisms by which carbohydrates are synthesized from carbon dioxide and water using light as an energy source. Most forms of photosynthesis release oxygen as a byproduct.
Phytoplankton.	Microscopic floating plants that live suspended in bodies of water.
Piscivore.	Feeding on fish.
Planktivorous.	Feeding on plankton.
Plankton.	The community of suspended or floating organisms that live in open water.
Riparian.	Pertaining to the banks of a river, stream, or other, typically, flowing body of water. Also the plant and animal communities along such bodies of water.
Rivulet.	A small stream or brook.
Runoff.	That portion of precipitation that moves from the land into surface water bodies.
Scoping.	Is an ongoing process that uses public involvement to determine the areas where problems or solutions are created or impacted and areas you will address by communicating with participants, core team members, and decision makers. Scoping looks at various perspectives to define the crucial issues in your process, critical resources, and how the resources and solution interrelate. This helps define your study boundaries.
Secchi disk.	A circular plate used to measure the transparency or clarity of water by noting the greatest depth at which it can be seen.
Seiche.	An oscillation of the water surface of a lake or other body of water due to variations in atmospheric pressure, wind, or minor earthquakes.
Setback.	Denotes the positioning of a structure in relationship to a stream bank. A setback regulation can be a requirement for the placement of urban buildings away from a stream bank or shoreline.
Stratification.	The arrangement of a body of water, such as a lake, into two or more horizontal layers of differing characteristics, such as temperature, density, etc.

Subwatershed.	An area drained by a single stream or group of minor streams.
Surficial.	Of, relating to, or occurring on or near the surface.
Synoptic survey.	Short-term investigations of specific water-quality conditions during selected seasonal of hydrologic periods to provide improved resolution for critical water-quality conditions.
TDP.	Total dissolved phosphorus.
Thermocline.	The region in a thermally stratified body of water that separates warmer oxygen-rich surface water from cold oxygen-poor deep water, and in which temperature decreases rapidly with depth (same as Metalimnion).
TKN.	Total Kjeldahl nitrogen.
TP.	Total phosphorus.
Trihalomethanes (THMs).	Chemicals formed from the reaction of chlorine with organic matter.
Trophic state.	Refers to how productive is a body of water, i.e., how much food is available in the system to support living organisms.
TSS.	Total suspended sediments.
Veligers.	Larval stage of zebra mussels.
Watershed.	An area that, because of topographic slope, contributes water to a specified surface water drainage system, such as a river or lake.
Wetland.	An area that is periodically inundated or saturated by surface or groundwater on an annual or seasonal basis, that displays hydric soils, and that typically supports or is capable of supporting water-loving vegetation.
Zebra mussels.	Invasive fresh water mollusks native to the Caspian and Black Sea areas (<i>Dreissena polymorpha</i>).
Zoning.	The partition of a city, town, or village by local law or ordinance, into sections reserved for different land-use purposes, such as residential, business, manufacturing, greenbelt, or agriculture.
Zooplankton.	The animal part of the plankton. They are secondary consumers feeding on bacteria, phytoplankton, and detritus. Because they are grazers in the aquatic environment, zooplankton are a vital part of the aquatic food web.
µg/l.	Micrograms per liter.

List of Acronyms

ACOE	Army Corps of Engineers
AEM	Agricultural Environmental Management
AFO	Animal Feeding Operation
BMP	Best Management Practice
CAFO	Concentrated Animal Feeding Operation
CCE	Cornell Cooperative Extension
CLA	Conesus Lake Association
CLAWS	Conesus Lake Aquatic Weed Strategy
CLWMP	Conesus Lake Watershed Management Plan
CRP	Conservation Reserve Program
CSLAP	Citizens' Statewide Lake Assessment Program
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FL-LOWPA	Finger Lakes-Lake Ontario Watershed Protection Alliance
G/FLRPC	Genesee/Finger Lakes Regional Planning Council

GLOW	Genesee-Livingston-Orleans-Wyoming Region Solid Waste Management Committee
LCDOH	Livingston County Department of Health
LCPD	Livingston County Planning Department
MCL	Maximum Contaminant Level
NGVD	National Geodetic Vertical Datum
NRCS	Natural Resources Conservation Service
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOPRHP	New York State Department of Parks, Recreation, and Historic Preservation
NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
PEOC	Public Education and Outreach Committee
PWL	Priority Waterbodies List
PWC	Personal Water Craft
RC&D	Resource Conservation and Development
SEQR	State Environmental Quality Review
SEQRA	State Environmental Quality Review Act
SPDES	State Pollution Discharge Elimination System
STRC&D	Seneca Trails Resource Conservation and Development
SUNY	State University of New York
SWCD	Soil and Water Conservation District
THM	Trihalomethane
TMDL	Total Maximum Daily Load
USCGA	United States Coast Guard Auxiliary
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WSA	Water and Sewer Authority
WC	Watershed Council

Town of Livonia

35 COMMERCIAL STREET
P.O. BOX 43
LIVONIA, NY 14487
(585) 346-3710

Livingston County Planning Department

6 COURT STREET - ROOM 305
GENESEO, NY 14454
(585) 243-7550
[HTTP://WWW.CO.LIVINGSTON.STATE.NY.US](http://www.co.livingston.state.ny.us)

EcoLogic, LLC

ATWELL MILL ANNEX, SUITE S-2
CAZENOVIA, NY 13035
(315) 655-8305
[HTTP://WWW.ECOLOGICLLC.COM](http://www.ecologicllc.com)

Kat Nichols

NICHOLS GRAPHIC DESIGN & CONSULTING
PO BOX 566
LAKEVILLE, NY 14480
(585) 346-5437
[HTTP://WWW.CO.LIVINGSTON.STATE.NY.US](http://www.co.livingston.state.ny.us)

MARCH 2003

THIS REPORT WAS PREPARED FOR THE
NEW YORK STATE DEPARTMENT OF STATE
WITH FUNDS PROVIDED UNDER TITLE 11 OF THE
ENVIRONMENTAL PROTECTION FUND