

4. Agricultural Practices

<u>Agricultural Practices (A)</u>	<u>Development (D)</u>	<u>On-site Wastewater Systems (O)</u>	<u>Stormwater Runoff (SR)</u>	<u>Wastewater Treatment (WW)</u>			
<u>Drinking Water (DW)</u>	<u>Tourism and Other Economic Development (T)</u>	<u>Water Quality Standards (WQS)</u>					
<u>Water Quality (WQ)</u>	<u>Exotic species (ES)</u>	<u>Fertilizers and Pesticides (F)</u>	<u>Heavy metals (H)</u>	<u>Phosphorus and Nutrient Loading (N)</u>	<u>Organic compounds (OC)</u>	<u>Pathogens (P)</u>	<u>Sediment (S)</u>
<u>Comprehensive Planning (C)</u>	<u>Education (E)</u>	<u>Economic Revitalization & Sustainability (ER)</u>	<u>Infrastructure (I)</u>				

Introduction

Agriculture is a dominant land use in the Cayuga Lake watershed. As reported in the *Preliminary Watershed Characterization Report*, approximately one-third of the direct drainage is in active agricultural production. Dairy farming is a major industry; about 57% of the agricultural lands in the watershed are dedicated to livestock and products, and 42% are in field crop production. The largest dairy farms are located in Cayuga County. As measured in sales, field crop production is concentrated in Seneca and Cayuga Counties.

Agriculture is an important economic and land use partner in the watershed. The highly valued open space and beautiful vistas in the watershed are a direct result of agriculture shaping the landscape. However, county census data reveal that a diminishing percentage of the work force is directly involved in agricultural production. This decrease reflects the dramatic trend away from the small farm and towards increased size and mechanization of farming operations. At the same time, increasing numbers of watershed residents are choosing to live outside of the more densely populated areas, resulting in rural residents who are unfamiliar with the realities of farming operations and less tolerant of inevitable odors or inconvenience.

The economic and technological trends promoting larger farming operations can increase the challenges associated with careful management of soil and water resources. Even the most environmentally conscious producers are faced with handling an excess of nitrogen and phosphorus; that is, more nutrients enter from feed, fertilizers and (for nitrogen) legume fixation than leave via milk, meat, or crops. The excess increases with the number of cows per acre.

The primary pollutants of concern in the Watershed are nutrients (phosphorus and nitrogen), sediment, pathogens, organic material, and pesticides. As discussed in the *Preliminary Watershed Characterization*, and Chapter II, these substances may originate from many sources including residential lands and urban stormwater. Nutrients, sediment, pathogens, organic material, and pesticides can migrate from agricultural lands to surface and ground water through processes including surface runoff, erosion, infiltration, and aerial drift (for more information see Appendix H).

Monitoring data confirm that agricultural pollutants reach the surface waters (both the tributary streams and the lake) and groundwater of the Watershed. Phosphorus and sediment can degrade the quality of surface water resources. Nitrate-nitrogen, due to its high solubility, is a contaminant of special concern in groundwater. Monitoring data confirm the loss of pesticides to streams and their presence in lake waters. Left unchecked, migration of nutrients, sediment, pathogens, organic material, and pesticides threatens the long-term health of the lake and watershed (for more information see Appendix H).

Goals

- Maintain viability of agricultural land use in the Cayuga Lake watershed.
- Minimize the negative impact of agriculture on the environment and reduce migration of pollutants to surface and groundwater.
- Increase public awareness of agricultural practices and environmental protection activities.

Existing Measures

Soil conservation and land stewardship are important values of the Watershed's agricultural community. A network of technical assistance and financial support for agriculture has been in place for decades. Agencies including County Soil and Water Conservation Districts, the Natural Resources Conservation Service of the U.S. Department of Agriculture, the Farm Services Agency, Cornell Cooperative Extension, and others actively promote measures to reduce the potential adverse impacts of agriculture on the environment. For the most part, producers have adopted measures that are protective of Cayuga Lake and the Watershed. Many of these measures are voluntary, although state and federal regulation of farming practices has increased in recent years. Some important programs are listed below, with examples of how they are implemented in the watershed.

- Agricultural Environmental Management (AEM) (see Appendix H - Agricultural Programs)
- The Environmental Quality Incentives Program (EQIP)) (see Appendix H - Agricultural Programs)
- New York State now requires livestock farms over a certain size (for dairies, more than 210 – 230 milk cows) to develop Comprehensive Nutrient Management Plans (CNMP) that comply with standards developed by New York State and the NRCS. Once the plan has been created and approved, the State issues a permit to the farmer. New York has adopted this measure as part of its implementation of the federal Clean Water Act requirements for Animal Feeding Operations/Concentrated Animal Feeding Operations) (see Appendix H - Agricultural Programs). Tompkins County has received a grant of \$120,000 from the Agricultural Nonpoint Source allocation of the NYS Environmental Protection Fund to develop CNMP on 26 farms in the Cayuga Lake watershed. Components of a CNMP include feed management, manure handling, land management, and record keeping. By 2008, all farms with livestock will be subject to these regulations regardless of herd size.
- New York State Clean Water/Clean Air Bond Act has provided funding to implement agricultural BMPs. For example, Tompkins County has received approximately \$190,00 to implement livestock grazing practices such as fencing, alternative watering systems, pasture improvements and stream crossings.
- Tompkins County Soil and Water Conservation District has recently purchased a no-till drill through a grant from the Great Lakes Commission in an effort to reduce erosion and sedimentation on watershed farms.

No. 4	Agricultural Practices Recommendations	Related Issue(s)	Potential Responsible Org(s)	Measure/Target	Approx Cost
A	<p>Through the framework of the Agricultural Environmental Management (AEM) (see Appendix H - Agricultural Programs) program, implement whole farm planning (the focus is on individual producers). Critical issues such as water quality and habitat protection within the farm's watershed are central considerations in identifying pollutants and protective measures. Practices are selected based on site-specific conditions of soil type, topography, drainage, cropping practices, and livestock density.</p>				
	<p>The four most critical issues in this watershed in need of Best Management Practices (BMP) are: nutrient management, erosion control, manure management, and herbicide application.</p>				
A1	<p>All farms in the Cayuga Lake watershed should develop a Comprehensive Nutrient Management Plan (CNMP) (for more information see http://www.dec.state.ny.us/website/dow/cafofact2.html) that meets the provisions of NRCS/New York State Standard 312 (see Appendix H). The Comprehensive Nutrient Management Plan should include specific recommendations tailored to individual producers and the conditions of soil type, drainage, cropping practices, and livestock density.</p>	A, SR, DW, WQ, N, P	SWCD, NRCS, LO, CCE	100% of livestock operations by 2008 based on federal regulation	\$15/acre without soil testing
	<p><i>The overall objective of the CNMP is to balance the nutrients entering and leaving the farm. In order to reduce phosphorus losses from agriculture, off-farm inputs of phosphorus in feed and fertilizer should be balanced with outputs in products such as milk, meat, and crops. Soils should be managed to retain nutrient resources for crops. Specific elements of the NMP may include the following (NYS Standard 590):</i></p>				
A1 a	<ul style="list-style-type: none"> Promote nutritional management as a tool to optimize feed efficiency and ultimately reduce nutrient content of animal waste. Nutrient management (590) cost sharing may be available through EQIP or Ag Nonpoint Source programs (see Appendix H) 	A, SR, DW, WQ, N, P	SWCD, NRCS, LO, CCE	100% of livestock operations by 2008 based on federal regulation	\$25,000
A1 b	<ul style="list-style-type: none"> Test soils and crops to define fertilization rate and timing 	A, SR, DW, WQ, F, N, P	SWCD, NRCS, LO, CCE		\$10/field/s ample \$0.50/acre

A1 c	<ul style="list-style-type: none"> Use the phosphorus (available phosphorus) index (currently in final approval stages for application to New York State watersheds) to determine the rate of manure application to specific fields. 	A, SR, DW, WQ, N, P	SWCD, NRCS, LO, CCE		
A1 d	<ul style="list-style-type: none"> Plant small grain cover crops in regions with high leaching potential where nutrients need to be controlled. 	A, SR, DW, WQ, F, N, P, S	SWCD, NRCS, LO		\$30 to \$50/acre
<p><i>Many of the larger dairy farms in the Cayuga Watershed have begun to develop CNMP that meet the NRCS/New York State Standard 312 (see Appendix H) as part of the permit requirements for the CAFO program. The CAFO regulations, which currently apply to larger livestock operations, provide a framework for developing and implementing parcel-specific recommendations for cultivation, cropping, and manure spreading practices designed to minimize environmental impact. Under the current implementation timetable, farms with animal herds of all sizes will be subject to the CAFO regulations by 2008.</i></p>					
<p><i>The recommendation to develop Comprehensive Nutrient Management Plans extends to crop farms as well.</i></p>					
A2	Erosion control				
A2 a	<ul style="list-style-type: none"> Create and maintain riparian buffer zones for all streams adjacent to agricultural land starting with the critical areas (see Table 2-2) as defined in Areas of Concern section of Chapter II (cost-sharing for this program may be available through the Conservation Reserve Program (see Appendix H - Agricultural Programs). 	A, SR, DW, WQ, S	USDA, NRCS, SWCD, CCE, LO	25% of critical areas (see Table 2-2) within 10 years as defined in AoC section of Chapter II and NRCS	\$250,000 (landowner contributes 25% of total project)
A2 b	<ul style="list-style-type: none"> Restore very severe streambank segments (see Appendix S) using Watershed Stream Restoration Method (see Appendix S) based on Cayuga Lake Watershed Streambank Inventory (2000) (see Cayuga Lake Preliminary Watershed Characterization Section 3.4.1.2). Concentration is on segments of Big Salmon Creek, Cayuga Inlet, and Fall Creek. 	A, SR, DW, WQ, S	SWCD, CCE, LO	3 miles/year for 10 years	\$30/foot
A2 c	<ul style="list-style-type: none"> Implement contour strip cropping, conservation tillage, terracing, and/or critical area planting (on-field solutions) where appropriate. 	A, SR, DW, WQ, S	USDA, NRCS, SWCD, CCE, LO	25% of critical areas (see Table 2-2) within 10 years as defined in AoC section of Chapter II and NRCS	Varies with slope, farm, and possible cost sharing

A2 d	<ul style="list-style-type: none"> Implement vegetated filter strips (edge of field solutions) where appropriate. 	A, SR, DW, WQ, S	USDA, NRCS, SWCD, CCE, LO		
A2 e	<ul style="list-style-type: none"> Install fences to keep livestock from critical areas 	A, SR, DW, WQ, S	NRCS, SWCD, LO		\$1/running foot minimum - 2 strand tensil installed
A3	Agricultural Waste Management (including manure, barnyard runoff, silage leachate, and milkhouse waste)				
A3 a	<ul style="list-style-type: none"> Develop waste management plans consistent with the NRCS/New York Standard 312. (See Conservation Practice Standard Waste Management System, NRCS, in Appendix H) 	A, SR, DW, T, WQ, N, P	NRCS, SWCD, LO, CCE, AI	100% of CAFO operations by 2004 or operations with NOI (with the exception of A3b). A3b - 6 projects within 5 years.	\$25/acre
A3 b	<ul style="list-style-type: none"> Consider the feasibility of technologies that reduce the mass of animal waste material to be handled. 	A, SR, DW, T, WQ, N, P	NRCS, SWCD, LO, CCE, AI		\$300,000
A3 c	<ul style="list-style-type: none"> Implement BMPs for the following: silage leachate, barnyards, and milkhouse waste where appropriate; separate clean water from wastewater and protect areas from surface runoff; and channel leachate and milkhouse waste through vegetated filter strips to reduce nutrient and organic levels. 	A, SR, DW, T, WQ, N, P	NRCS, SWCD, LO, CCE		\$50,000/fa rm (some are done)
A4	Pesticide management (<i>in the Cayuga watershed, herbicides are the type of pesticides of greatest concern</i>) includes enforcing regulatory controls on pesticide application - (<i>for more information see http://www.dec.state.ny.us/website/dshm/pesticid/appman.htm#cert</i>) and the use of residential and commercial sources of pesticides.				

A4 a	<ul style="list-style-type: none"> Implement appropriate Integrated Pest Management (IPM) techniques (implementation of practices and reduction) (see Appendix H - Pesticides). 	A, SR, DW, WQ, F, OC	NYSDEC, SWCD, LO, CCE, AI, PC	Already have 100% in some form of IPM. 5 years to develop database and use as baseline data	\$10/acre (varies with size of field)
A4 b	<ul style="list-style-type: none"> Implement watershed-wide pickup of hazardous wastes and obsolete/canceled use pesticides using the "Agricultural Clean Sweep" model. (see also Hazardous Waste Management section) 	A, SR, DW, WQ, F, OC	NYSDEC, SWCD, LO, CCE	3-4 year cycle based on use	\$100,000
B	In addition to the focus on individual producers through the AEM and CAFO (see Appendix H - Agricultural Programs) programs, develop cooperative and/or regional strategies to address problems faced by producers throughout the watershed.				
B1	Develop markets for agricultural byproducts. Get baseline inventory now and inventory continuously.	A, DW, WQ, N, P, ER,	USDA, NRCS, SWCD, C, LO, CCE, AI	5% in 10 years	\$50,000
B2	Promote cooperative arrangements between dairy producers and crop farms to dispose of manure and develop a system to index the value of the resource (manure) that is equitable to both parties.	A, DW, WQ, N, P, ER, CCE	NRCS, SWCD, C, LO		\$50,000
B3	Support research and development of innovative animal waste treatment systems such as methane digesters (see http://www.ext.colostate.edu/PUBS/FARMMGT/05002.html), sequencing batch reactor (SBR), vermiculture (see http://www.composters.com/docs/worms.html), resource recovery and others.	A, DW, WQ, N, P	USDA, NRCS, SWCD, AI, LO, CCE	6 projects in watershed in 10 years	\$300,000
B4	Provide software and training for producers throughout the watershed to help manage the record keeping associated with recommendations related to management of nutrients, agricultural wastes (including manure), and pesticides (use for IPM data).	A, DW, WQ, F, N, OC, P, E	USDA, NRCS, SWCD, AI, LO, CCE	25% in 5 years (training and adopted). NRCS software available May 2001	\$1,000/farm
B5	Provide training and materials for producers throughout the watershed to develop Emergency Action Plans (part of CAFO).	A, DW, WQ, F, N, OC, P, E	USDA, NRCS, SWCD, LO, M, PC, NYSDEC	100% by 2008 based on federal regulations	\$5,000

C	Develop educational materials for producers and the community at large.				
C1	In cooperation with the IPM program at Geneva, develop and maintain an information repository (or database) of effective IPM techniques used in the Watershed (part of A4a and associated with data clearinghouse).	A, SR, DW, WQ, OC	AI, CCE, SWCD	5 years	\$20,000
C2	Document and disseminate locally successful strategies for nutrient management, manure handling, and erosion control using a variety of outreach media. Develop public information materials that discuss agricultural issues of concern to the entire watershed community such as the factors affecting farm size, regulatory and voluntary measures to control agricultural pollution, and the relationships between agriculture and other amenities such as open space. Consider publishing reports in trade journals for the dairy industry.	A, SR, DW, WQ, N, P, S, E, ER	USDA, NRCS, SWCD, AI, CCE, LO	document 3 successes per year	\$5,000
D	Counties and municipalities should consider agricultural programs (see Appendix H - Agricultural Programs) that are both economically and environmentally sustainable. Specific recommendations include the following:				
D1	Consider agricultural protection and preservation while addressing associated land conservation and water quality concerns through various county, state and federal programs that is consistent with Ag & Farmland Protection Plans	A, D, SR, DW, T, WQ, C, ER	SWCD, NRCS, C, M	Consistent with Regulatory Management Section	-
D2	Encourage alternative agricultural uses of land including changing zoning laws to allow additional (mixed use) business enterprises on the farm.	A, T, C, ER	SWCD, C, M	Consistent with Regulatory Management Section	-