

# Keuka Lake Watershed Farmland & Agricultural Protection Plan

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# Keuka Lake Watershed Farmland & Agricultural Protection Plan

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# Introduction

The Keuka Lake watershed is a uniquely beautiful land. Made up of Yates and Steuben Counties, the area is appreciated for its agricultural productivity, charm, and picturesque rural landscape. Such unspoiled beauty has made the area a tourist attraction for residents of the upstate region and beyond. In recent years, however, the Keuka Lake watershed has come to face pressure from development and commercialization. The communities of the area now recognize the need to protect the region's agriculture as well as safeguard the natural features that contribute to the beauty of the lake.

The following plan looks at what is currently available in the farmland protection toolbox in the state of New York, with the thoughts of the local agricultural community, collected in a series of interviews summarized throughout the plan. Recommendations are made for significantly improving farmland protection efforts, however, these suggestions are no substitute for a broadly shared vision and dogged leadership on the part community leaders.

The vision provided is grounded in the values brought forth in the process of developing the Keuka Lake Watershed Farmland Protection Plan and includes:

A long standing commitment to agriculture in the county as evidenced by families that have been farming here for more than 200 years, many who have come in succeeding generations, and by the continuing influx of new farmers to our communities.

The knowledge that the business of farming is a valuable contributor the watershed's economy, generating in product sales via both the internal and external marketing of Steuben and Yates grown products.

Confidence in the farm community that if farmers can make a profit, they have the knowledge and drive to continue to farm the lands in the watershed into the foreseeable future.

An admiration for the incredible work ethic of farmers, which utilizes nearly every waking hour of the day for family, farm work and sometimes traditional off-farm work.

Farm families have a long tradition of engagement that has translated into volunteer efforts and leadership roles within their respective communities.

Farmers are devoted to the stewardship of the land, farm animals and the environmental features of the county.

A large segment of the non traditional farming county residents greatly value living in a rural community with a highly scenic working landscape and other environmental features, and want to ensure that these qualities will remain.

Acknowledgment of the growth and acceptance of plain sect agrarian communities within the area and all that they contribute in terms of character and agricultural output.



## Agricultural History

Agriculture first appeared in the Keuka Lake watershed nine hundred years ago with the Owasco people who brought the “Three Sisters” technique of planting. This consisted of maize, beans, and squash, which benefit from each other when planted close together. Early European explorers of the Keuka Lake watershed encountered the Iroquois, a group of Native Americans who are thought to have first arrived five hundred years ago. The Seneca tribe of Iroquois occupied land west of Seneca Lake, which equates to modern-day Steuben and Yates Counties. The Seneca tribe remained in the area until European settlers drove them off the land following the Revolutionary War. The Seneca called the area “O-go-ya-ga”, which translated as “the promontory” and most likely refers to Bluff Point. Other sources claim that “Keuka” can be interpreted as “bent elbow”.

A dense forest originally covered the land. The forests consisted mainly of sugar maple, beech, hickory, red and white oaks, tulip poplar and black walnut. On the higher hills and ridges, white pine was common. Chestnut, white ash, butternut and basswood grew on the drier parts. Elm, black ash, willow, poplar, and soft maple were common in the valleys. Hemlock and gray birch grew in cooler, more shaded areas.

The first European settlers of the Keuka Lake cleared practically all of the land for farms. Lumbering was the primary industry until 1851, which was when the Erie railroad was completed between New York and Buffalo. This

greatly facilitated the development of agriculture in the county and enhanced the marketing of products.

The first settlers of the watershed cleared practically all of the forested land for farms. They had no way of distinguishing between good and poor land for farming, so the land that was found to be unfit for farming, was abandoned and reforested. These reforested areas serve as natural reservoirs to help with flood prevention and soil erosion control.

Furthermore, winemaking is another vital aspect of agriculture in the Keuka Lake watershed. In this region the first bonded winery was established in 1860. The Keuka Lake area is also where the first U.S. Vinifera vines were planted. The introduction of these fantastic vines sparked a winemaking renaissance in the area that still thrives today. Most of the vineyards are located on steep hillsides overlooking Keuka Lake, which gives the vines optimal drainage, better exposure to the sun, and a reduced risk of frost. Currently, Keuka Lake wineries offer many different types of wines, ranging from dry to sweet, fruity to austere, hybrid to native. There is a wine for everyone, and each winery also has its own unique restaurants, shops, tasting rooms, and incredible views.

A revitalized industry in the area is the production of hops. Hops are an important aspect of the brewing industry, which has become popular again in the Finger Lakes region. The production of hops was once extremely widespread in upstate New York, especially in the Keuka Lake region. During the mid



# Agricultural History

1800's, nearly 90% of the total hop crop of the United States was raised in New York State. The decline in popularity of growing hops was due to a terrible fungus disease that spread through the region. In addition, farmers in the western United States saw the success of the product in New York and began farming hops as well. The interest of hops has returned to the Finger Lake Region once again, and is sure to demand great attention in the near future.





# Watershed Overview

## Land Area within Watershed by Municipality

	Square Miles	Acres	% of Watershed
<b><i>Yates County</i></b>	<b>93.77</b>	<b>60,008</b>	<b>53.2</b>
Barrington	15.97	10,220	9.06
Benton	5.67	3,630	3.22
Italy	0.23	150	0.13
Jerusalem	54.52	34,890	30.94
Milo	11.02	7,050	6.25
Potter	6.28	4,020	3.57
Penn Yann	0.08	48	0.04
<b><i>Steuben County</i></b>	<b>82.41</b>	<b>52,747</b>	<b>46.8</b>
Bath	2.34	1,503	1.33
Pulteney	28.20	18,050	16.01
Urbana	34.97	22,380	19.85
Wayne	11.55	7,390	6.55
Wheeler	4.98	3,190	2.83
Hammondsport	0.37	234	0.21



## Soil and Geology Background

The Keuka Lake watershed is located in the center of New York's Finger Lakes region. Glacial movement has proven to be the most defining attribute of the Keuka Lake watershed and the Finger Lakes as a whole. The first glacier, the Kansan Glacier, began its movement across the continent approximately one million years ago and is responsible for the landscape as we see it today. The second glacier, the Wisconsinan Glacier, was active 9,000 to 12,000 years ago, leaving behind rock deposits such as drumlins, esters, moraines, kames, and erratics. The movement of these glaciers caused the deep and narrow lakes of the region to form as well as the hanging valleys, steep slopes, rounded hills, gorges, and waterfalls.

Keuka Lake is rather distinct from the rest of the Finger Lakes as it is the only one with a major peninsula and is in the shape of a "Y". The lake is approximately 20 miles long, 2 miles wide at the widest point, and 186 feet deep. Keuka Lake drains north into the Seneca Lake watershed via the Keuka Outlet.

The Keuka Lake watershed's geology consists of vast amounts of limestone, sandstone, and shale. Millions of years ago, a shallow sea covered the Finger Lakes region. This allowed for sediments such as sand, gravel, pebbles, mud, and lime from the ancient Adirondacks and other mountains to the east to settle and compress into the rock formations of the current day gorges.

In the Finger Lake region, the two most critical factors in determining soil characteristics are source rocks and topography. The bedrock of the Keuka Lake watershed consists of sedimentary rocks deposited 375 to 360 million years ago during the Middle and Upper Devonian Period. Today this region is part of the hilly, glaciated Allegheny Plateau. The fact that much of the best agricultural land is located in the northern part of the Keuka Lake watershed is a result of a significant limestone presence in the area. The bands of limestone have high lime content, which has proven beneficial for growing crops. The watershed's topography (a region with lower elevations than the Allegheny Plateau to the north) allowed for more lime deposits to flow downhill and to concentrate in the upper watershed as glaciers ice passed through central New York.

Following the deposition of the bedrock, the Allegheny Plateau was uplifted and eroded by streams draining southward toward the Atlantic Ocean through the Susquehanna River system. During the Ice Ages, which commenced approximately two million years ago, a mile-thick ice sheet advanced and retreated at least four times through the basin. The ice further deepened, widened, and straightened the existing valley. During the retreat of the final glacier, the ice front halted at the south end of the lake near Hammondsport, depositing a steep, linear ridge of glacial till known as the Valley Heads Moraine. This moraine effectively dammed the channel, creating Keuka and most of the other Finger Lakes.



# Soil & Geology Background

## Soil Conditions

Six types of surface conditions exist within the Keuka Lake watershed. At the northwest and south ends of the lake are broad bands of lacustrine (lake) silts and clays, as well as deposits of organic muck and alluvial (water deposited) materials located along the swampy lowlands of Sugar Creek near Branchport and along the Keuka Inlet at Hammondsport. Most of the upland areas of the watershed are covered with deposits of glacial till (mixture of glacially laid rocks, sand, silt and clay) varying in thickness from a few feet to twenty feet or more. In many places the till is completely absent and bedrock is exposed at the surface. Glacial outwash (materials deposited by glacial meltwater) has been found along Sugar Creek and in the valley between Hammondsport and Bath, as well as in the lowland between the village of Keuka Park and Keuka State Park.

Around the perimeter of the lake hundreds of gullies cut steep and broken land. The soils of these tributaries are deeply dissected and eroded. In some areas, the slopes are nearly vertical with large rock outcroppings. In other areas, the soils are deep and have a tendency to slump down hill, causing a great deal of erosion and sedimentation in the lake. The best use of these areas is maintaining natural forest vegetation to provide forest cover and soil retention.

Near Hammondsport and Branchport, poorly drained silt

loam soils are common along the Cold Brook and Sugar Creek inlets. Since these soils are periodically flooded and are wet most of the year, they provide excellent soils for wetland and wildlife habitat.

**Implications of Soil Runoff on Water Quality**  
The implications of poor soil runoff from the watershed on the lake itself. Keuka is the third largest of the Finger Lakes in volume and size, occupying about 11,614 acres. The lake is 19.6 miles long, an average of 0.71 miles wide, a maximum of 186 feet deep and contains about 375 billion gallons of water.

The lake is drained by the Keuka Outlet, which flows from Penn Yan to Dresden on Seneca Lake. The lake is controlled by a set of gates operated by the Village of Penn Yan and owned by the Keuka Lake Outlet Compact, a board consisting of the eight supervisors and mayors of the municipalities around Keuka Lake.

The quantity and quality of water in Keuka Lake depends on the water draining into the lake from the watershed. The watershed boundary - roughly defined by the hills surrounding the lake - is often far away from the lake itself and crosses many political boundaries.

Most of the water reaching the lake arrives via tributaries, which drain 29 major sub-watersheds or directly through groundwater flow. The drainage basin of the watershed, including the lake surface, measures 174 square miles or 111,360 acres.

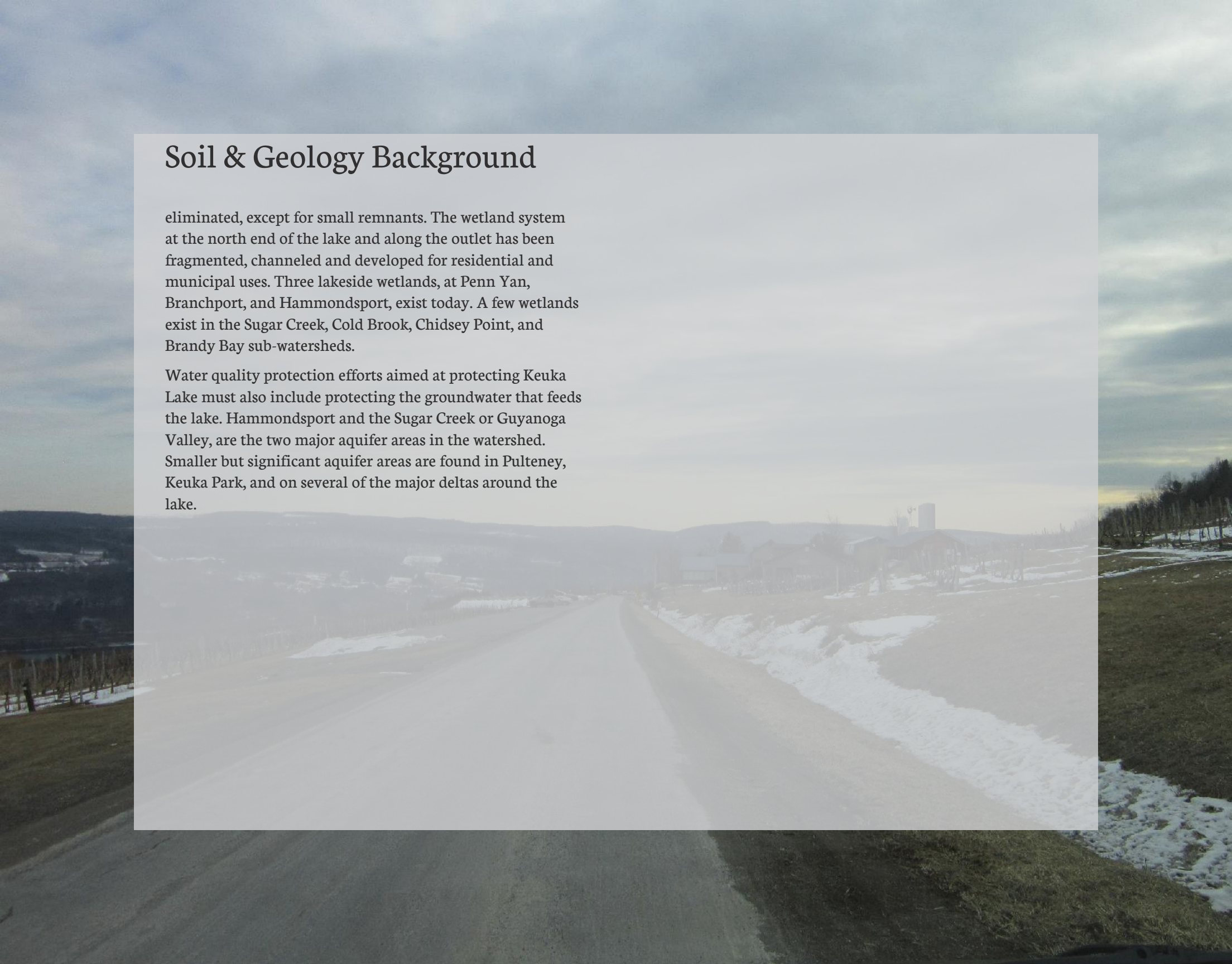
Many of the wetlands of the Keuka Lake watershed have been drained and/or filled for development and agricultural use. Upland, lakeside and streamside wetlands have been mostly



## Soil & Geology Background

eliminated, except for small remnants. The wetland system at the north end of the lake and along the outlet has been fragmented, channeled and developed for residential and municipal uses. Three lakeside wetlands, at Penn Yan, Branchport, and Hammondsport, exist today. A few wetlands exist in the Sugar Creek, Cold Brook, Chidsey Point, and Brandy Bay sub-watersheds.

Water quality protection efforts aimed at protecting Keuka Lake must also include protecting the groundwater that feeds the lake. Hammondsport and the Sugar Creek or Guyanoga Valley, are the two major aquifer areas in the watershed. Smaller but significant aquifer areas are found in Pulteney, Keuka Park, and on several of the major deltas around the lake.





## Current Economic Conditions

The Keuka Lake Watershed has a diverse economic base. While there is no single dominate sector, agriculture is an essential and growing industry in the region. Agriculture consists of much more than farming. The industry includes supporting businesses and services located within the region (e.g. seed and equipment) as well as viniculture and forestry. In the Keuka Lake Watershed, the agricultural industry is an economic asset. In addition to being an essential sector of the economy, agriculture serves to protect the rural character of the watershed, support the growing tourism industry, and maintain the high quality of place expected by residents and visitors alike.

The 2007 Census of Agriculture confirms that the agriculture industry continues to grow in the Keuka Lake Watershed. In Steuben and Yates County, the number of farms and land dedicated to farming has increased in the past five years, while the average farm size has decreased. As of 2007, there were 1,578 farms in Steuben County (up from 1,501 in 2002) and 864 farms in Yates County (up from 722 in 2002). The 2007 Census of Agriculture also showed that agricultural sales have dramatically increased in the past five years, reaching \$135,286,000 in Steuben County and \$88,382,00 in Yates County. This marks a 60% sales increase in Steuben County and a 75% sales increase in Yates County from 2002 to 2007.

Farming in the Keuka Lake Watershed includes strong grain, dairy, vegetable, wine, and other livestock sectors. Milk and other dairy products from cows are the highest grossing

commodity group in both Steuben and Yates County, with sales valued at \$75,256,000 and \$44,095,000 respectively in 2007. In Yates County, Fruits, tree nuts, and berries was the second highest valued commodity group at \$17,064,000. In Steuben County, Cattle and calves was the second highest commodity group valued at \$11,865,00, with Vegetables, melons, potatoes, and sweet potatoes following close behind at \$11,847,000.

Agriculture is an economic asset to the Keuka Lake Watershed because it produces higher economic multipliers than any other sector of the economy. An economic multiplier indicates how many times a dollar of sales re-circulates in the local economy – for feed, supplies, and labor in the case of agriculture. A 1996 study conducted at Cornell University revealed that dairy production has an economic multiplier of 2.29 and Fruits and vegetables processing has an economic multiplier of 1.67, relative to 1.48 for services (including tourism), and 1.40 for retail and wholesale trade. This study shows how agriculture and dairy production in particular go farther than other sectors in helping the local economy.

Although farms receive governmental benefits and preferential assessments afforded by the Agricultural District Law, they are in fact tax winners. A 1995 study conducted by the Cornell Cooperative Extension of Tompkins County and Tompkins County Agricultural and Farmland Protection Plan found that farms are beneficial because they do not require large amounts of services and also provide benefits such as employment. The data revealed that agriculture typically produces \$1.00 in tax revenue for every 15¢ to 40¢ of town and school expenditures it generates.



## Current Economic Conditions

Residential development, in contrast, costs \$1.09 to \$1.56 per \$1.00 of taxes gathered. This data is consistent with several other similar studies conducted in the region.

Forestry is a valuable component of the agricultural industry. The economic value of forestry is frequently underrated due to its long crop rotation and period of economic returns. In Steuben and Yates County, 53% and 51% of land is considered timberland, respectively. The largely hardwood forests in the watershed produce high quality timber in addition to high quality foliage, which attracts tourism throughout the Northeast during the Fall season. From a global perspective, hardwood lumber is a lucrative niche business. The 1996 Cornell study previously mentioned found the economic multiplier for wood products to be 1.78. While forestry is an important sector of agricultural industry, it can be described as somewhat underdeveloped in the Keuka Lake Watershed. Below average cutting rates for certain species within Steuben and Yates County suggest there is additional harvest potential within the watershed.

Viniculture is currently booming in the Finger Lakes region. Yates County is the second largest grape-growing County in New York State and has 36 wineries as of 2007. Steuben County has 15 wineries, which is also well above average. Many of these vineyards and wineries are located within the Keuka Lake watershed, along Keuka Lake. The New York State Farm Winery Act is an example of governmental legislation in support of local grape growing and wine

production. Furthermore, the passing of the New York State Farm Brewery Act in 2013 has stimulated the growth of the state's brewing industry. The opening of 14 farm breweries since January 2013 clearly shows that the New York craft beer industry is just beginning to take off.

Direct to consumer agricultural businesses, such as farm stands and farmers markets, are increasingly popular. Residents and visitors alike seek locally grown fresh fruits, vegetables and flowers, both organic and non-organic. Recent assessments have shown the Windmill Farm and Craft Market to attract 8,000 to 10,000 visitors per week. However, the Keuka Lake Watershed has a strong presence within consumer agricultural businesses in the region. Municipal support, event planning, and marketing within the watershed could further encourage the growth and demand of these agricultural enterprises. Supporting direct to consumer agribusiness will help strengthen agricultural and tourism industries within the watershed.

In addition to the wineries and breweries that attract tourists to the Keuka Lake Watershed, the picturesque landscapes and rural character preserved by working agriculture also support tourism and recreational activities. Agriculture plays a significant role in preserving the watershed's rural character and scenic views by protecting open space and natural resources. Furthermore, agriculture discourages suburban sprawl and steers development toward hamlets and villages within the watershed. There is a direct relationship between farming and the attractiveness of Keuka Lake Watershed as a place to both live and visit.



# Current Economic Conditions

## Profile of Selected Economic Opportunity

	Employed civilian population (16 years and over)	Farming, fishing, and forestry occupations	Percentage	Farmers and Farm Managers	Percentage
New York State	8,382,988	24,609	0.3	21,493	0.3
Steuben County	44,141	603	1.4	732	1.7
Yates County	11,191	312	2.8	348	3.1
Pulteney	662	16	2.4	31	4.7
Urbana	1,107	5	0.5	19	1.7
Wayne	520	8	1.5	15	2.9
Barrington	557	7	1.3	31	5.6
Benton	1,197	38	3.2	76	6.3
Jerusalem	2,075	33	1.6	43	2.1
Milo	3,266	65	2.0	31	0.9
Potter	873	35	4.0	53	6.1

Data taken from 2000 Census information.



# Zoning

## Zoning as a Tool for Protection

Zoning is one of the key tools utilized to implement the vision set forth in a community master plan, protect community character, maximize return on public investments in infrastructure and protect valued land and open space resources. For decades, however, zoning regulations have emphasized the development of land. As a result agriculture and agricultural lands times have been treated more as secondary and even transitory land uses. The prevailing practices in zoning tend to view agriculture as a useful activity pending the anticipation of development of the land for its “highest and best use” and not as a valuable long-term contributor to the local economy and quality of life in the community.

In recent year zoning philosophies have evolved to a point where agriculture and agricultural lands are recognized as community assets that should be protected and supported in the same manner as residential, commercial, industrial and other types of land uses. Today more communities are embracing “ag-friendly” zoning to better promote the long-term viability of their agricultural communities. In general this means reviewing and amending zoning regulations to provide for the wide variety of enterprises beyond traditional agricultural activities that farmers today may engage in, that recognize agriculture as a legitimate land use on par with residential and other land uses, as well as provide protection from development pressures in high growth areas.

For zoning to be considered “ag-friendly” it is important that zoning should address agriculture in:

### *Purpose statements*

Should be tied to goals of Comprehensive Plan and should elevate role of agriculture in community

### *Definitions*

Broadly define agriculture, and specifically define many related terms such as farm, farmland, agritourism, ag business, roadside stand, etc.

### *Use schedules*

Allow many agricultural uses in more than one zoning district:  
Do not restrict location of agribusinesses and roadside stands.

### *Dimensions/bulk requirements*

Exempt or limit restrictions on height, height, building size, lot coverage, setbacks, yard requirements for farms.

Require buffers between farm and non-farm uses where new non-farm use is responsible for providing for the buffer

### *Procedures*

Include agricultural resource information on required site plans and special use applications (put agriculture at same level for review as wetlands, streams, other environmental features).



# Zoning

## Zoning Recommendations

### *Streamline Zoning Code*

Municipalities should review their local zoning regulations to ensure that they are not unduly burdensome in regulating agricultural uses. A zoning code that is “Ag-Friendly” provides a clear and easy set of rules and regulations for officials to follow.

### *Allow for Tangential Ag Use*

When drafting zoning codes be sure that they provide the flexibility that farmers need to engage not only in traditional agriculture, but side business enterprises that supplement or support agricultural operations.

### *Follow Already Established Limits*

When drafting zoning codes be sure to look at stipulations and limits already in place. It’s also important that they comply with the limitations set forth in the NYS Agriculture and Markets Law.



# Agricultural & Farmland Protection Initiatives

## In New York State

New York State has formalized agricultural and farmland protection initiatives that focus on: agricultural districts, tax relief for farmers, right to farm “package”, agriculture and farmland protection program and the advisory council on agriculture. The law acknowledges the hardships faced by farmers and other agricultural professions, such as the constant threat of development by non-farm projects.

### *Agricultural Districts*

The notion of agricultural districts was put forth as a practical political method to protect New York state farmland. In order to qualify as an agricultural district, a piece of land must be at least 500 acres, or 10% of the district, and a proposal must be submitted to the local legislative body. Designation as an agricultural district provides farmers with economic benefits and protection against potentially harmful local regulations.

### *Tax Relief*

Tax relief is essential for farmers, as farmland is high in property tax. Overtaxed agricultural land is an unappealing aspect to farmers, and so tax relief works as a farmland protection tool. Agricultural assessment works to provide property tax relief for farmers. These tax incentives are implemented through: Ad valorem limitations, farmers’ school tax credit, farm building exemptions, and local tax abatement.

### *Right to Farm “Package”*

The right to farm “package” is commonly referred to as the right-to-farm law, and works as a nuisance protection law. Such a law works to strengthen farmers’ abilities to defend themselves in nuisance suits brought on by neighbors or local governments, by protecting farmers from restrictive local laws. The Agriculture District Law provides five types of right-to-farm protections:

1. Definition of what constitutes an agricultural use
2. Local ordinance provision
3. Notice of public projects that have the ability to impact farms in agricultural districts
4. Sound agricultural practice determination
5. Disclosure notices that inform buyers of farming practices before they buy land in an agricultural district.

### *Agriculture and Farmland Protection Program*

The agricultural and farmland protection program encourages counties and towns to work with farmers to promote local initiatives as a means to maintain the economic vitality of agriculture as well as protect the industry. There are four main concerns addressed in this section:

1. Agricultural viability and profitability
2. Agricultural land use and farmland protection
3. Agricultural awareness
4. Public education and municipal land use.



# Agricultural & Farmland Protection Initiatives

## In New York State (cont'd)

### *County Agriculture and Farmland Protection Boards*

The county legislative body consists of eleven members including: the chair of the county soil and water conservation district's board of directors, a member of the county legislative body, a representative of the county cooperative extension, the county planning director and the county director of real property services. The county agriculture and farmland protection boards are sanctioned to make recommendations about government proposals that are to take place within agricultural districts, update farmland protection plan, and take on an active role within local agricultural policy.

### *The Advisory Council on Agriculture*

The Advisory Council on Agriculture (ACA) is appointed by the government, and has the permission to suggest proposals relevant to agricultural policy and economics. The ACA consists of eleven members.

## In the Keuka Lake Watershed

### *Conservation Easements*

Conservation easements should be created to protect valuable farmland property in the county. Such easements should be limited to high-value farmlands that are threatened by development. This would effectively separate commercial and residential development rights from farming rights in the county, giving the ability to preserve farmland while protecting open space, critical mass and future opportunities to farm, while also allowing farmers to redeem equity in farmland. The easements should be based on a one-generation type easement agreement (say 20-25 years) where some portion of the easement might be purchased with tax relief that is illegal to give away forever.

### *Incentives for Productive Farmland Use*

Incentives for making productive use out of idle farmland could include short-term tax abatements to encourage re-cultivation and later placement under the regular Agricultural Assessment program. Technical and marketing assistance could also be made available to farmers interested in taking over abandoned fields and putting them into new agricultural uses. Accessible use of agricultural cooperatives for farmers who need consultation on agricultural issues (land tenure practices, drought management, etc.)

### *Reduction of Property Tax Burdens*

The Agricultural and Farmland Protection Board needs to equip farmers with the ability to reduce their property tax



# Agricultural & Farmland Protection Initiatives

burdens through an educative program. Farmers need to become aware of existing tax benefits, as there are already several instituted for New York State farmers and vineyard owners. A farmer's tax guide and annual seminars need to be created to educate farmers on this issue in an accessible and approachable way. The Agricultural and Farmland Protection Board needs to be active, along with the Farm Bureau, in speaking to tax issues, so that community farmers can be up-to-date on relevant tax policies.

## *Ecosystem Services Markets*

Ecosystem Services Markets pay farmers for providing environmental benefits including: clean water, carbon sequestration and wildlife habitat. It acts as a cost-effective measure to improve the environment through agricultural conservation practices.

## Protection Analysis: Current Conditions & Topography

Most of the shoreline has been developed for cottages and second homes, which have been built on steep or wet sites. Development has been increased by the lake's proximity to urban centers. The result is an "urban corridor" surrounding the lake, with increasing development pressure on agricultural land. Away from the lakeshore, 54% of the watershed land is covered with shrubs, early successional trees, and/or mature forests, and 34% of the watershed land is used for agriculture. About 10-15% of watershed land is in transition from agriculture to residential use, with 3-5% of the watershed being used for residential, commercial and industrial purposes.

The Keuka Lake watershed is characterized by deep valleys with steep side slopes that project upward for several hundred feet to creating rolling terrain, with slopes that often exceed 45 degree angles. The northern side of the watershed has much shallower slopes and lower elevations compared to the western shoreline.

For more than one hundred years there has been a gradual abandonment of farmland in the Keuka Lake watershed and a comparable re-growth of wooded land. Currently, about 54% of the watershed land is forested with the woodland in an early stage of succession. Pines, poplar, red maple, hawthorn, pine cherry, and various dogwoods are the dominant species found throughout the watershed. Forested areas in the watershed, particularly on



# Agricultural & Farmland Protection Initiatives

steeper slopes, provide many water quality benefits, such as storm water retention and erosion and sediment control.

More than 20,000 people rely on Keuka Lake as a source of potable drinking water, where 10,000 of those people draw water directly from the lake for domestic use. The remaining 10,000 people purchase water from municipalities in the watershed.

## Protection Analysis: Recommendations

### *Integrated Pest Management*

(IPM) is a wholly integrated approach to safely and effectively control insects, weeds and plant diseases. Monitoring and identifying pests is the first step, as not all pests need to be eliminated. Prevention is part of integrated pest management, which can be done through techniques such as the use of pest-resistant crops, crop rotations and using beneficial insects, which makes the risk of pests much smaller.

### *Crop Diversity*

Crop diversity is important, as the genetic diversity of plants makes a cropping system less susceptible to pest damage by a single species. Planting several variations of the same crop also works as diversity, as it is likely that the same pest will not be interested in every variety.

### *Contour Plowing*

The practice of contour plowing works by planting across a slope following its elevation contour lines. Planting based on contour lines creates a water break, as the ruts made by the plow run perpendicular to the slope, which reduces the formation of gullies during times of heavy water run-off, helping to prevent the loss of top soil and decrease soil erosion. The water break also allows more time for the water to settle into the soil, instead of creating runoff.

### *Crop Rotation and Cover Crops*

Crop rotations have logical orders that are chosen so the crops planted in one season can help replenish the nutrients that the previous crops depleted from the soil. The system is simple: Plant grains after legumes or row crops after grains to help build up nitrogen in the soil. One of crop rotation's biggest advantages is that it can prevent the transmission of disease because most of these diseases and pests affect a specific type of crop, which can be eradicated by switching to a different crop in the next year's rotation. Planting cover crops (such as legumes) allows the soil to regenerate through nutrient replenishment, moisture conservation, and the decreased need for fertilizers and other chemicals.

### *Managed Grazing*

Rotating livestock so that they graze in different areas of pastureland is important as it decreases soil erosion, increases



# Agricultural & Farmland Protection Initiatives

nutrients in the soil through leftover manure, and increases nutrition of livestock by giving them access to various plants.

## *Attracting Beneficial Animals and Insects*

Attracting beneficial animals is an important way to reduce pest problems, as it is essentially a free way to manage pests. Both birds and bats are helpful for this, and will often remain if they have a place to nest. Beneficial insects, such as ladybugs and beetles, are also great means of pest control. Ladybugs are attracted to plants with pollen, which acts as their food source.

## Sustainable Energy Alternatives

### *Biodiesel*

Biodiesel is a clean-burning fuel made from renewable, biodegradable sources. It can be made from vegetable oils and animal fat, and can be blended with petroleum diesel in any proportion and used in diesel engines without major modification. The use of biodiesel instead of petroleum diesel reduces air pollutants and greenhouse gases, and is biodegradable non-toxic. Production is growing rapidly, and fuel production is simple and inexpensive to produce.

### *Wind Energy*

Wind turbines provide energy for a home or farm whenever the wind is blowing. Net metering programs are functioning in several states and allow wind energy producers to sell

excess energy back to the utility, allowing their electric meter to “spin backwards.” Rural landowners may lease land to power companies for large-scale wind projects, while other landowners may pool their resources to start cooperatively owned wind projects.

### *Solar Energy*

Passive solar designs reduce the need for mechanical heating and cooling. South-facing windows and the use of heat-absorbing tile, concrete flooring, or other “thermal mass” can keep buildings warmer. Carefully designed awnings and landscaping can keep buildings cooler in hot weather. Photovoltaics (“PV”) convert solar energy into electricity. Farmers and ranchers are using photovoltaics to pump water, power lighting, charge electric fences, and run all sorts of appliances at locations far from the power grid.

### *Hydropower*

Hydropower equipment harvests kinetic energy from moving water to produce mechanical power and to generate electricity. Farms often have easy access to lakes and ponds as well as naturally occurring streams and rivers.

### *Anaerobic Digesters and Other Biomass Options*

Anaerobic digesters convert biomass material into energy. Biomass energy can also be generated from the direct combustion or gasification of agricultural products and forest waste material. Digesters have environmental and economic benefits; they reduce odors from livestock manure, prevent the release of greenhouses



# Agricultural & Farmland Protection Initiatives

gases, produce energy and heat, and reduce labor costs associated with manure removal. Biomass energy production can be produced through burning organic material in open fires; however better efficiency is available through modern wood and pellet stoves, or through gasifying the biomass material and turning into various fuels.

## *Energy Co-ops and Local Ownership*

Wind energy cooperatives enable farmers to pool their resources, as farm owners can sell their own commodities to the plant, and are eligible to receive annual dividends. A main benefit to energy cooperatives is the allowance of rural communities to control and profit from their own agricultural resources.

## *Reducing Food Miles*

The vast majority of energy consumption within the U.S. food system occurs after the food is harvested. Produce in the U.S. travels, on average, 1,300 - 2,000 miles from farm to consumer. Local food systems can reduce “food miles” and transportation costs, offering significant energy savings, while allowing more food dollars to stay within rural communities.

## Methods of On-Farm Energy Conservation

### *Review Tax Reports on Energy Use*

By looking at these as well as energy bills from the last few years, you can determine which areas can be improved upon.

For grain operations, diesel, electricity and propane are typically the highest energy expenditures for a farm operation.

### *Upgrade Lighting Systems*

Compared to traditional incandescents, energy-efficient light bulbs have many advantages. While the initial price of these bulbs is slightly higher, they cost less to operate because they use 25-80% less energy. Energy-efficient light bulbs also last significantly longer than traditional light bulbs, meaning they do not need to be replaced as often.

### *Modify Irrigation Systems*

Switching from high to low-pressure sprinkler systems can save, on average, \$55 and 77 kWh per acre annually. More efficient irrigation tools such as drip, trickle and low-flow sprinkler systems save energy, money and water.

### *Design Efficient Buildings*

Windows that are properly sited will light the inside of a building while operable windows and skylights can enhance cooling and ventilation. Proper insulation also reduces heating and cooling expenses by protecting farm buildings from extreme temperatures.

### *Farm Energy Audit*

Energy audits are a fantastic way to help farmers save energy and money. Typically, these audits analyze equipment and processes such as lighting, ventilation, power, units, drives, compressors and insulation. Then, energy-saving recommendations are provided.





# Agricultural & Farmland Protection Initiatives

## Findings

Given the variety of protection initiatives outlined above, there are several specific actions recommended:

- Consider land uses in Keuka Lake Watershed and create Urban Growth Boundaries.
- Revisit the current agricultural district boundaries to ensure that they are up to date and reflect both deliberate future urban development and current agricultural uses.
- Encourage landowners to participate in agricultural assessments to provide tax relief and gather soil data.
- Complete a comprehensive soil survey and utilize the resulting information to create incentives that encourage land use that complements the soil type and quality of a particular area.
- Utilize a cluster zoning policy on land under severe pressure to be developed.
- Foster agricultural direct marketing enterprises through educational sessions and improved zoning ordinances that allow for outbuildings and secondary land uses associated with agriculture.

- Provide further educational opportunities for landowners to learn about transfer of development rights (TDR), agricultural conservation easements, and purchase of agricultural conservation easement programs.

### *Urban Growth Boundaries*

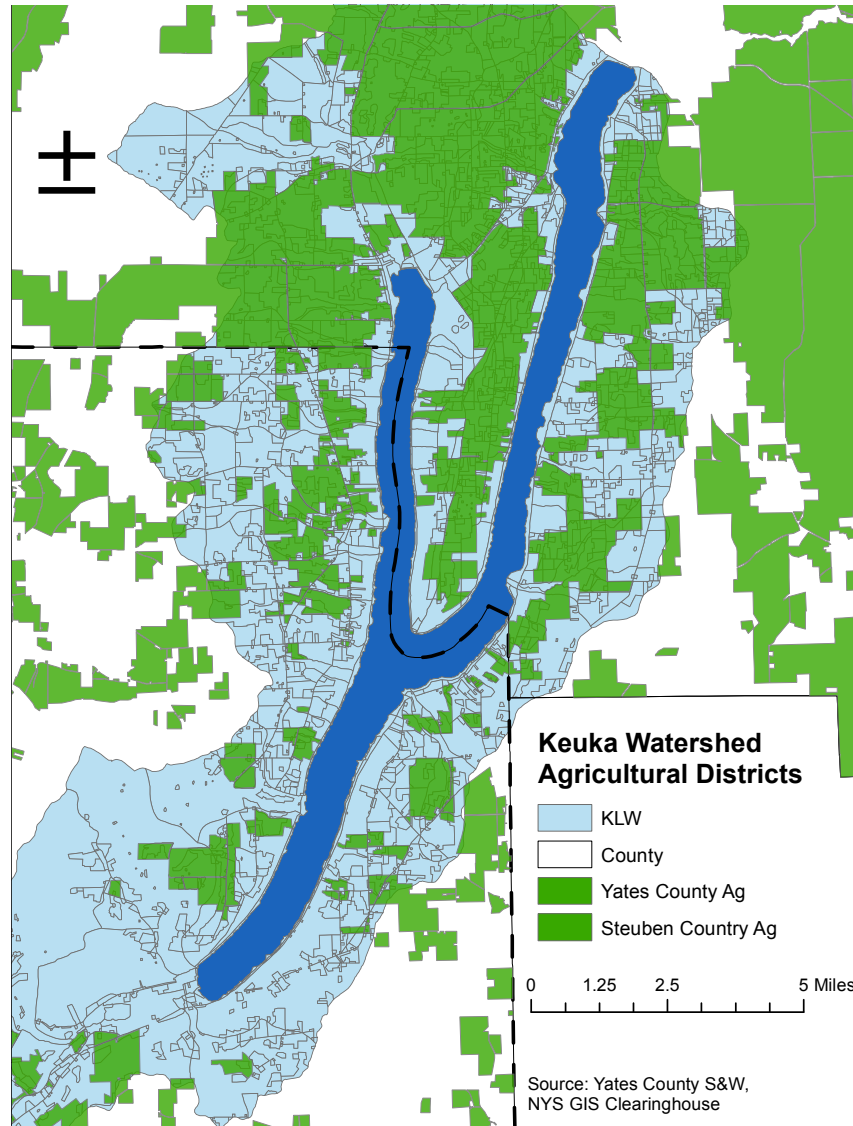
Urban growth boundaries (UGB) define areas identified as anticipated development, and serve as guides for decisions regarding zoning, infrastructure improvement and construction, utilities expansion, and land use ordinances. Regarding agricultural protection, confining future development to a specific area prevents land better designated as agricultural uses from being developed.

### *Agricultural Districts*

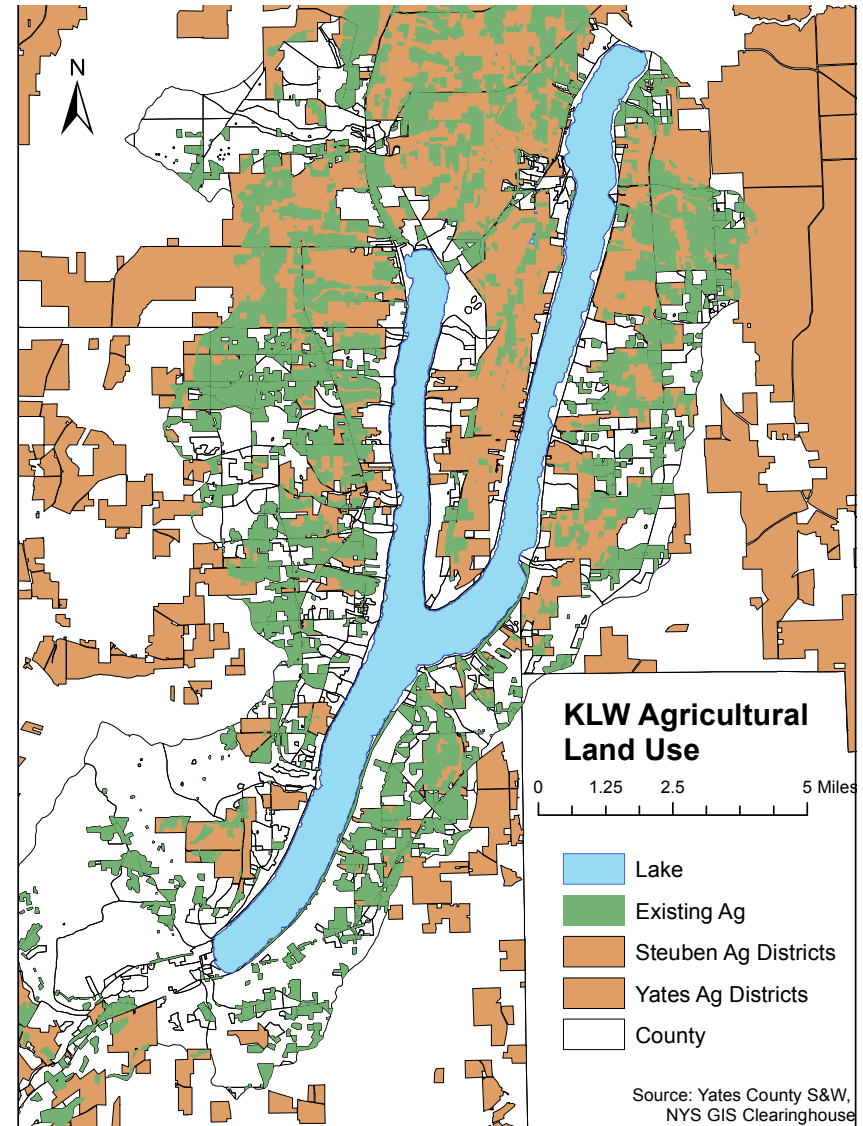
Currently, much of the land within the Keuka Lake Watershed is contained within agricultural districts (refer to Map 1). That said, there are significant areas currently in agricultural use that are not within agricultural boundaries (refer to Map 2). A survey could reveal whether those parcels should be considered for an expansion of existing agricultural districts, or whether agricultural uses in those areas should be actively discouraged. Agricultural districts might also consider future development and infrastructure enhancement, based on future urban growth boundaries.



Map 1: Keuka Lake Watershed  
Agricultural Districts



Map 2: Existing Agriculture and  
Existing Agricultural Districts





# Agricultural & Farmland Protection Initiatives

## *Agricultural Assessment*

Agricultural districts allow landowners within those districts to receive property assessments based on agricultural value rather than development potential. This provides a significant tax relief for farmers, particularly those with land under pressure from nearby development. Expanding agricultural districts to include all land currently in agricultural use and delineating urban growth boundaries would allow farmers to receive agricultural assessment and thus significant annual savings.

## *Soil Survey*

Agricultural assessment in New York State is based on soil rating. The soil rating methodology is based on soils' inherent ability to support crop production, so knowing more about soils throughout the agricultural districts in Steuben and Yates county will yield a more accurate agricultural assessment.

## *Cluster Zoning*

Cluster zoning allows (or sometimes mandates) that houses be constructed at higher densities than what is normally required or allowed. The intention of cluster zoning is to focus new construction in a small area and thus preserve large tracts of un-developed land for agricultural uses. Cluster zoning could be incorporated into existing zoning laws, specifically within existing or future agricultural districts.

## *Direct Market Enterprise*

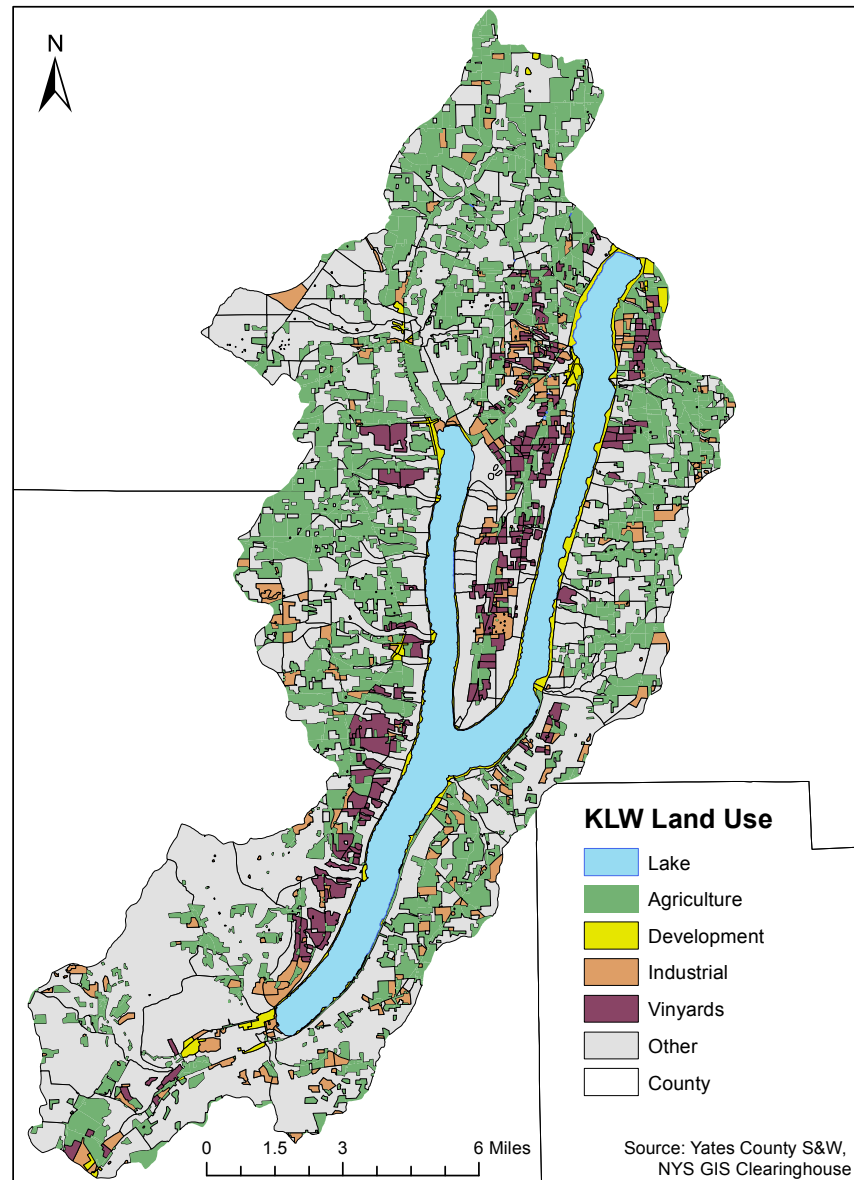
Approximately 20% of New York Farmers utilize direct marketing of some of their products according to the National Agricultural Statistics Service. Allowing outbuildings that support direct market enterprise as part of agricultural land use could foster increased direct marketing. Outbuildings include structures such as farm stands, smoke houses, sugar shacks, cideries, etc. Additionally, direct marketing can effectively utilize the region's active tourism industry with additional marketing materials and an updated survey of what farms engage in direct marketing. Further educational and informational material for farmers including guidelines about what and how to sell or market good could increase the number of farmers actively pursuing direct market enterprise.

## *Easement and Conservation Education*

There are several conservation easement initiatives in place in New York State and the Keuka Lake Watershed, including Agricultural Conservation Easements, Purchase of Agricultural Conservation Easements, and Transfer of Development Rights, amongst others. Education farmers and landowners about these opportunities is essential to ensuring successful conservation of agricultural land and watershed protection. Educational sessions and materials can be updated to assist landowners with the process of attaining easements and collaborating with regional land trusts and local governments.



Map 3: Land Use within  
Keuka Lake Watershed





## Conclusion

As we conclude our recommended Agricultural Protection Plan for the Keuka Lake watershed we would like to reiterate that this is a continual process, and by no means is anything set in stone. The most important thing to acknowledge is that the pressures of development and commercialization in this region have definitely caused the need for concern for preserving the agricultural and natural beauty of the land. Our recommendations have provided a holistic approach to attacking the four major concerns for an agricultural and farmland protection program. These are agricultural viability and profitability, agricultural land use and farmland protection, agricultural awareness and public education, and municipal land use. We hope that conservation easements, incentives for productive farmland use, reduction of property tax burdens, and ecosystem services markets are just a few of the many recommendations that can be developed and solidified into ready-to-implement practices. Again, we hope that these recommendations can provide useful guidance in your approaches to protecting the agriculture of the Keuka Lake watershed.





## Consulted Documents and Sources

The Farmland & Agricultural Protection Plan outlined in the previous pages synthesized and expanded upon various planning resources that examined the region and more general agricultural initiatives. Below is a comprehensive listing for future consultation and research:

### Planning Documents:

2007 United States Census of Agriculture

Costs of Community Services Study, Cornell Cooperative Extension of Tompkins County and Tompkins County Agricultural and Farmland Protection Plan (1995)

Yates County Looking Ahead & Growth Management, Tranick (1990)

### Websites:

Farm Energy Alternatives - [https://attra.ncat.org/attra-pub/farm\\_energy/index.php](https://attra.ncat.org/attra-pub/farm_energy/index.php)

Keuka Lake Association - [http://www.keukalakeassociation.org/local\\_resources.php](http://www.keukalakeassociation.org/local_resources.php)

Finger Lakes Wine Alliance - <http://www.fingerlakeswinealliance.com/history-of-region.html>

Upstate Chunk - NY Beers - <http://www.upstatechunk.com/beer/hops/nyhistory.htm>

Farmlandinfo.org

### Books:

Rutski, W. A. (1996). Steuben County: the first 200 years. Virginia Beach, Virginia: The Donning Company Publishers.

Thrall, W.B. (1996). Pioneer History & Atlas of Steuben County N.Y. Addison, NY: Southern Tier News Inc.

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