Maxwell Creek Watershed Action Plan

JULY 3, 2013

PREPARED FOR:
Maxwell Creek Watershed Coordinating Committee

PREPARED BY:
Center for Environmental Initiatives
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ACKNOWLEDGEMENT

This Action Plan was put together by a team consisting of representatives from the organizations listed below, along with the generous support from the Healing Our Waters Coalition (http://www.healthylakes.org/category/about-us) administered by Freshwater Future (www.freshwater.org).

- Wayne County (WC) Soil & Water Conservation District;
- WC Planning Department;
- Town of Sodus;
- Cornell Cooperative Extension of Wayne County; and
- Center for Environmental Initiatives.

EXECUTIVE SUMMARY

Residents, visitors, fisherman and boaters who use the Maxwell Creek and Maxwell Bay cannot access that resource to the extent they want due in part to eutrophication caused by excess nutrients and invasive vegetative covering in the stream. This project established a Maxwell Creek watershed planning group, completed a characterization of the water quality of Maxwell Creek and a quantification of the sources of phosphorous pollution loads, along with providing recommendations for remediation. This **Maxwell Creek Watershed Action Plan** will allow this newly formed watershed group to seek Great Lakes Restoration Initiative and other sources of funding to implement restoration projects.

Water quality sampling conducted during this project and previous studies by others show that Maxwell Creek has some of the highest mean concentrations of total phosphorous, the primary nutrient contribution, among streams discharging directly into Lake Ontario along the New York coastline of Lake Ontario. This data and analysis of the information collected during this project period resulted in the identification of two problems that the Maxwell Creek Watershed Coordinating Committee agreed warranted further attention:

1. Excess plant growth in Maxwell Bay caused by elevated phosphorus coming from the Maxwell Creek watershed; and
2. Limited fishery caused by excess nutrients, limited erosion control, and an impediment to fish migration further upstream than about quarter mile upstream from Lake Road.

This Committee established a plan to address these problems by investigating, scoping and implementing six projects:

1. <u>Muck Farmland Nutrients</u>: Develop and implement fertilizer application rates for tile drained farmland that use the minimum amount of phosphorus needed for proper plant growth;
2. <u>Sub-Irrigation of Drained Farmland:</u> Investigate the technical and economic feasibility of applying sub-irrigation technology to the muckland farms;
3. <u>Metz Pond Internal Load:</u> Investigate the technical and economic feasibility of reducing the internal phosphorus load from Metz Pond;
4. <u>Regulated Point Source:</u> Work with regulated point source to characterize their plant effluent to better assess the impact of that effluent on stream quality;
5. <u>Streambank Buffers:</u> Evaluate efficacy of streambank buffering; and
6. <u>Habitat Improvement:</u> Investigate the feasibility, benefit and cost to eliminate the impediment to fish migration up Maxwell Creek beyond a quarter mile upstream of Lake Road to expand the Maxwell Creek fishery.

I. Introduction

The U.S. portion of Lake Ontario's shoreline and watershed lies wholly in New York State. New York's Lake Ontario coastal waters are a valuable resource for drinking water, recreational boating, fishing and swimming, tourism, and waste water processing, and a key asset in the economic revitalization of upstate New York. But in spite of intensive study and significant water quality improvements in the open, offshore waters of the Lake over the last three decades, critical gaps in information and lingering impairments remain in the 322 miles of shoreline. River and creek mouths, and embayments suffer from many impairments that limit their recreational use, elevate the cost of drinking water withdrawals that serve over a million customers, including the Rochester and Syracuse metropolitan areas. Impairments of drinking water quality, shoreline property values, and the attractiveness of the lakeshore are of continuing concern to residents near the water, the general public using the beaches and walking the shoreline, tourists and water recreation enthusiasts.

Residents, visitors, fisherman and boaters who use the Maxwell Creek and Maxwell Bay cannot access that resource to the extent they want due in part to eutrophication and aquatic invasive growth caused by excess phosphorus in the stream. The goals of this project were to establish a Maxwell Creek watershed planning group, complete a characterization of the water quality of Maxwell Creek and a quantification of the sources of phosphorous pollution loads, along with recommendations for remediation. The resultant watershed restoration plan will allow this newly formed watershed group to seek Great Lakes Restoration Initiative and other funding to implement restoration projects.

Maxwell Creek, in the town of Sodus, NY, has been observed to have some of the highest mean concentration of total phosphorous (TP) among recent study sites in Wayne County, NY (*See Characterization of Eight Watersheds of Wayne County, New York, 2010-2011* in supporting materials).

Public Input

A Listening Session was held on August 28, 2012 at the Sodus Town Hall to allow the Maxwell Creek Watershed Coordinating Committee to describe this project's objectives, share what we knew at the time about the watershed, and solicit their input on issues of concern to them.

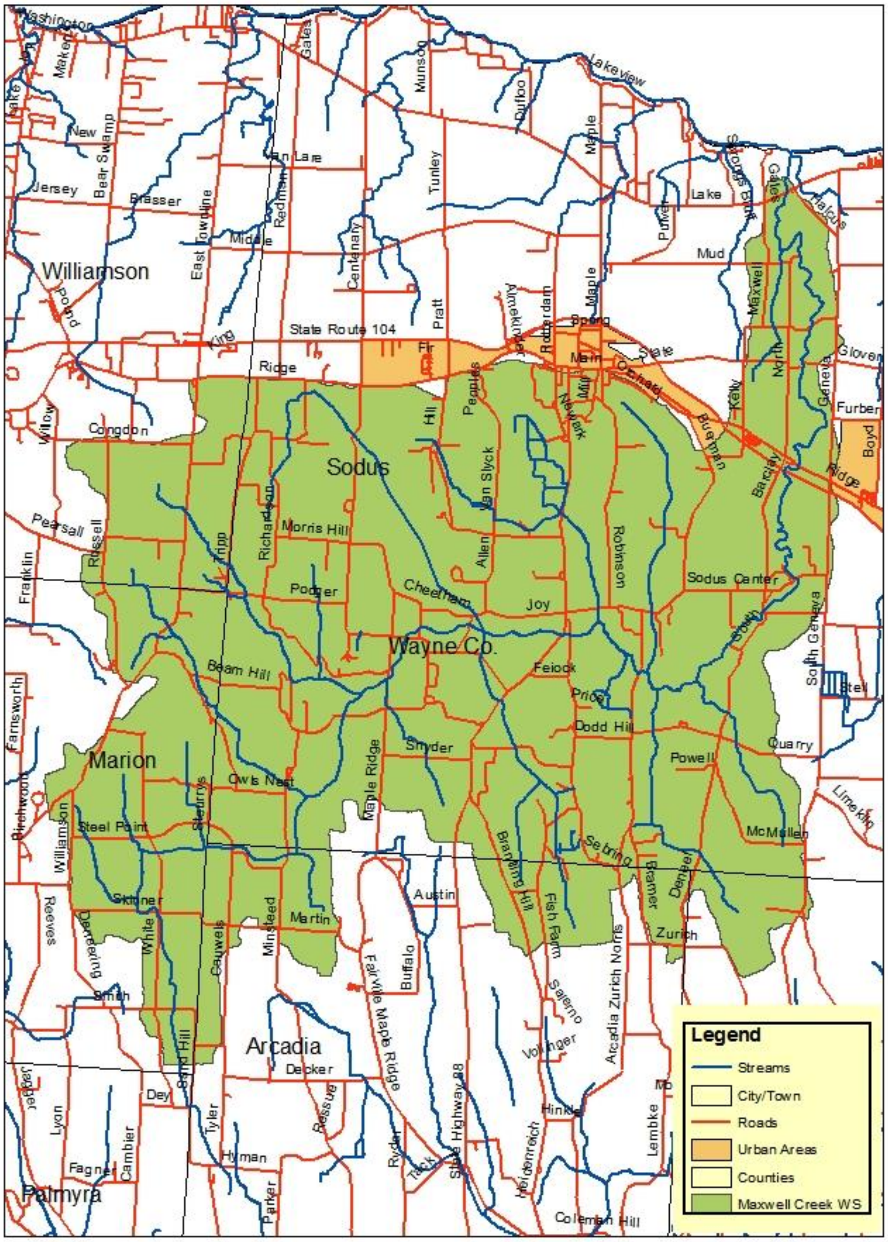
We described the project objectives as follows:

We described how this project came about from the interest of the Town of Sodus and availability of grant funding from the Healing Our Waters Coalition. Information was shared about how Maxwell Creek phosphorus levels compare to the rest of New York's Lake Ontario tributaries. (See section: III Watershed Conditions.) Those present were not aware of how high the phosphorus concentrations at Maxwell Creek were compared to other familiar local tributaries such as Salmon Creek in Pultneyville and Sodus Bay.

II. WATERSHED DESCRIPTION

General

Maxwell Creek Watershed



Map produced by the Center for Envrionmental Initiatives (CEI) Rev. 08-21

The Maxwell Creek watershed empties to Lake Ontario at Maxwell Bay. It is immediately west of First and Second Creeks which drain to Sodus Bay, north of Ganargua Creek, and East of the Mink Creek, Red Creek and Salmon Creek watersheds, about 27 miles east of the City of

Rochester. The Maxwell Creek watershed is medium-sized for tributaries to Lake Ontario, neither as large as the Genesee River nor as small as Salmon Creek. The watershed covers 11,191 hectares or 27,657 acres or 43.2 square miles.

Morphology and Glacial History

Maxwell Creek has an unusual shape, perhaps because of geological history. Maxwell Creek watershed is located primarily in the Town of Sodus, with smaller amounts in the Wayne County Towns of Williamson and Marion to the west and Arcadia to the south. The outlet of the watershed must have been trapped for some time against the “ridge”, a beach established by a higher pro-glacial Lake Iroquois. It then broke through the ridge on the northeast corner of the impoundment, near Wallington, and drained to the lake. Maxwell Creek and its tributaries are generally very low gradient streams, and the only high gradient section is that between Metz Pond and Lake Ontario, where it has become deeply incised. Maxwell Bay appears to be a “drowned” stream mouth which has captured a great deal of sediment from the watershed and from the steepest section of Maxwell Creek. Metz Pond, about 4.5 stream-miles south and upstream of the bay, must be capturing most of the watershed sediments since its creation.

The north end of the watershed is relatively flat lake plain whose soils were deposited during the proglacial period of several hundred thousand years when lake levels were higher and Great Lakes drainage was blocked by the retreating ice. The “ridge” that appears parallel to the lakeshore and about 3.5 miles to the south is actually a glacial deposit and beach of that proglacial Lake Iroquois. The Wayne County fields of drumlins created by the last glaciation and left in place about 10,500 years ago appear at the watershed’s south end. Brantling Ski Center is on a hill at the far south end of the watershed which is also one of the highest points in the county at 681 feet above mean sea level. The landscape of the south end of the watershed is dominated by north-south oriented steep-sided drumlins with swamps and marshes in the lowlands between them. The drumlins, on average are 160 feet high, 3,500 feet long and 1,000 wide.

Climate

The Maxwell Creek watershed is cold and snowy in winter and warm in summer. Average temperatures range from 25˚ F in January to 71˚ F in July. Persistent snowfalls during the winter are fed by moisture off Lake Ontario, hence “lake effect storms.” The 36 inches of precipitation is normally well distributed through the year. Average seasonal snowfall is 88 inches, and the storage of this snowfall December-March plus warm rains in March/April often lead to the highest amounts of runoff from the watershed in those months. Otherwise, rainfall is distributed at about 2.5-3 inches per month.

Geology

The bedrock beneath the Maxwell Creek watershed occurs in broad east-west oriented bands and dips at fifty feet per mile to the southwest. The oldest rocks are at the north edge. In order of appearance in the watershed from north to south, the bedrock is called Medina and Queenston formations, Sodus shale, Rochester shale, Lockport dolomite and Vernon shale. Lockport dolomite is noted for its permeability and often underlies "karst" topography in which sinkholes provide direct linkages between surface and groundwater.

Soils

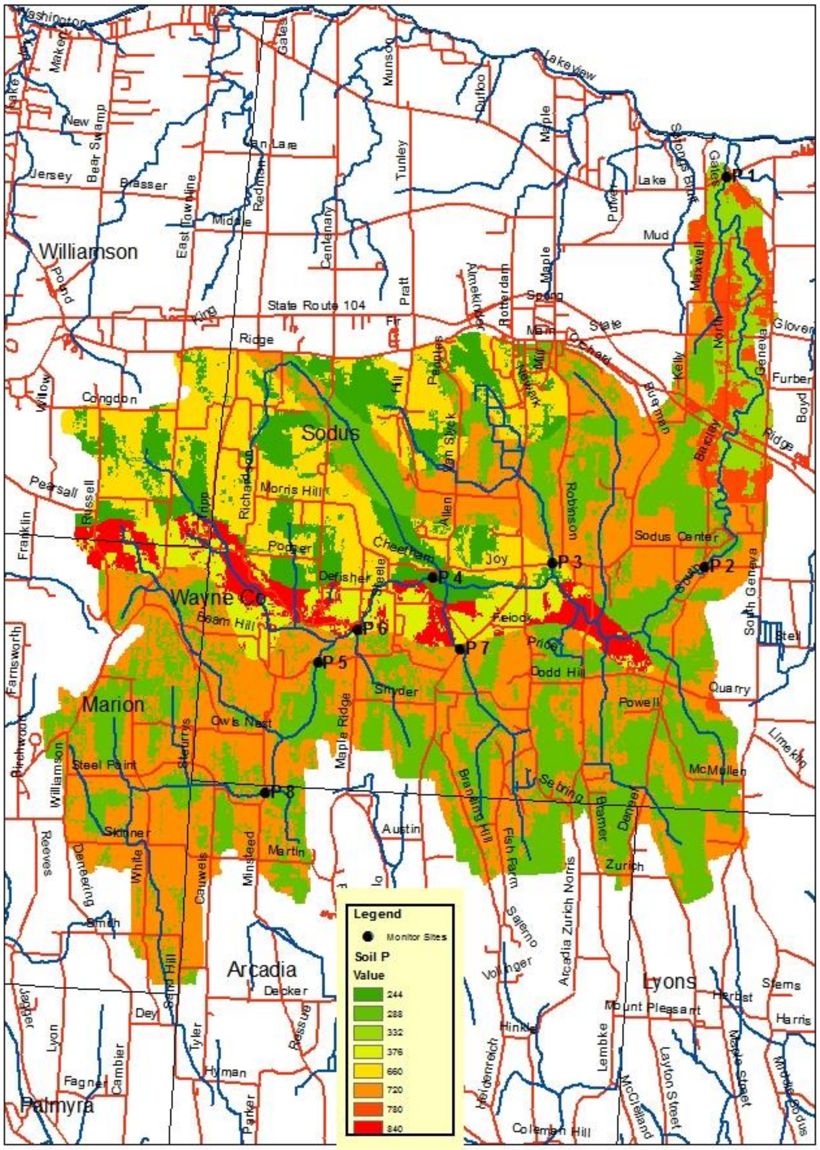
Most of the Maxwell Creek watershed is mantled with unconsolidated glacial deposits. By comparison with most soils of New York State, all of these soils would be characterized as at least moderately well-drained, which means that much of the snow melt and rain fall is absorbed into them and becomes part of the groundwater regime.

Soil types of the Maxwell Creek watershed (north to south) include: Williamson-Elnora-Collamer Association, Minoa-Phelps-Alton Association, Ira-Sodus Association, and Ontario-Hilton Association. All of these soils are characterized as deep (over six feet). Most of the mineral soils (as distinguished from muck soils) are characterized as being naturally high in phosphorous content. For purposes such as general field crops and orchards, they have no special fertilization needs.

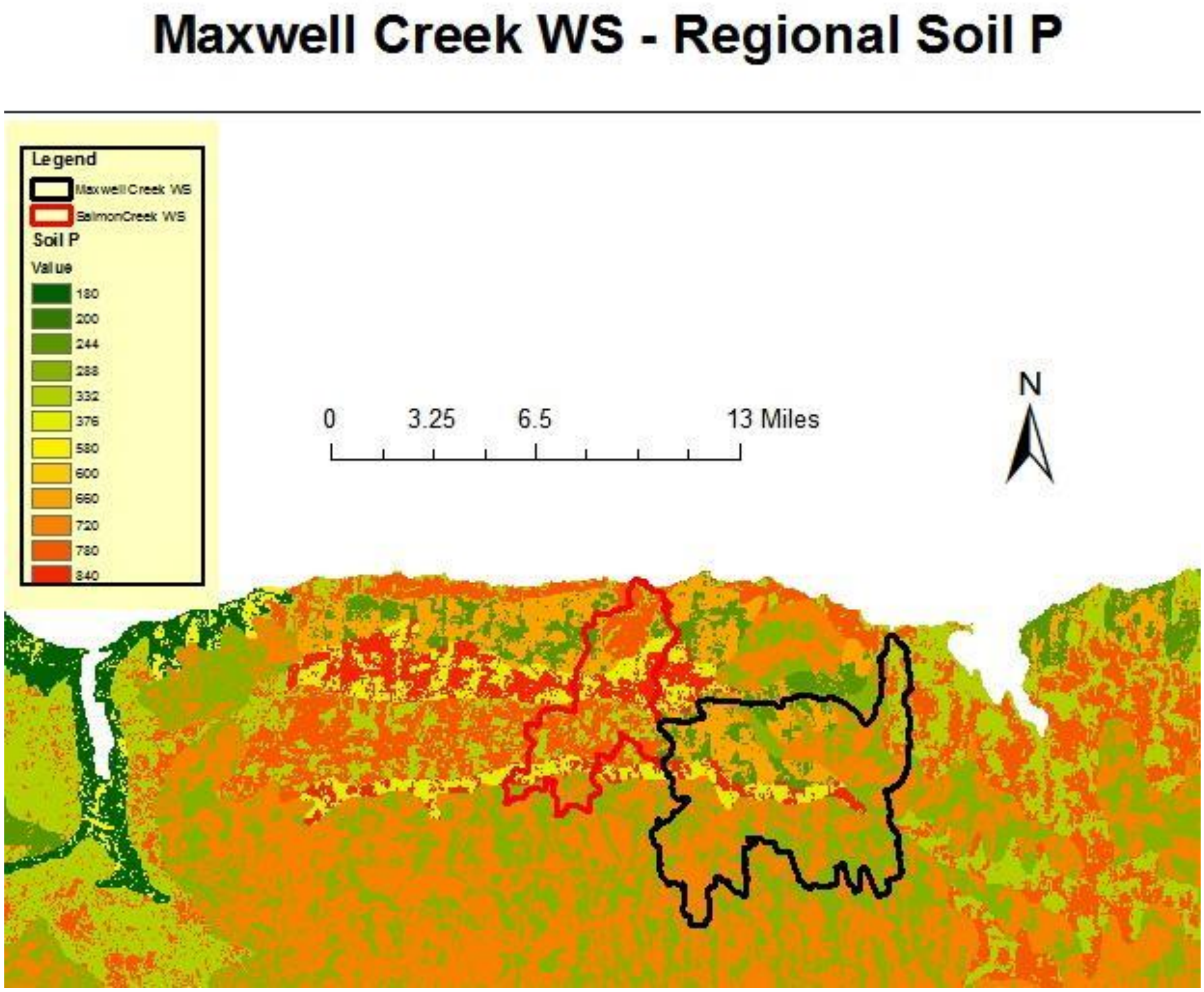
- Williamson is a moderately well-drained soil formed on lake plains and deltas in proglacial lake sediments dominated by silts and very fine sand.
- Elnora is a moderately well-drained soil formed on beaches and sand bars of the proglacial lake.
- Collamer is a moderately well-drained soil formed in predominantly silt sediments in the proglacial lake.
- Minoa is somewhat poorly drained soil formed from predominantly sand sediments on lake plains and deltas.
- Phelps is moderately well-drained soil formed on outwash plains, remnant beaches, and terraces containing sand and gravel.
- Alton is a well-drained to excessively drained soil formed on outwash plains, remnant beaches, terraces, kames and eskers in glacial outwash and beach deposits.
- Ira is a moderately well-drained soil formed on till plains, moraines, and drumlins from loamy glacial till.
- Sodus is a well-drained soil formed on till plains, moraines and drumlins from glacial till.
- Ontario is a well-drained soil formed on till plains, moraines and drumlins from glacial till.
- Hilton is a moderately well-drained soil formed on till plains and drumlins from glacial till.
- Carlisle is a deep, very poorly-drained soil formed in standing water of well decomposed organic matter more than 51 inches thick. Carlisle muck normally slopes less than 1%. These soils are often idle and wooded in the Maxwell Creek watershed, but when cleared and artificially drained will support root crops. Muck soils are normally low in phosphorus content and need to be heavily fertilized to support root crop growth.

Soils of the Maxwell Creek watershed are relatively high in phosphorus content, averaging over 300 parts per million. Not all of this phosphorus is available as a nutrient to growing plants. The first map below shows the soil phosphorus content in the Maxwell Creek watershed and the next one compares those levels with ones in Monroe County. Those creeks in Monroe County, Shipbuilders Creek and Mill Creek, have total phosphorus levels in the water on the order of 75 to 80 micrograms per liter versus over 230 micrograms per liter for Maxwell Creek. This indicates that the higher soil phosphorus levels in Salmon Creek watershed may contribute to the relatively high background levels of total phosphorus in the stream.

Maxwell Creek WS - Soil P



Map produced by the Center for Envrionmental Initiatives (CEI) Rev. 07-25



Maxwell Creek Soil Phosphorus Compared to Eastern Monroe County Watersheds

Unique Features

Metz (Ontario Center) Pond was created as a millpond by a dam at the Sodus Center Road. It covers about 24.5 acres and captures 90% of the flow from the watershed. This pond is located at an elevation of 394 feet above mean sea level about 4 miles south of Lake Road. This four mile reach of Maxwell Creek has a gradient of 0.6 feet of fall per 100 feet.

Camp Beechwood, previously a Girl Scout Camp and now a NYS Park, lies on the western side of Maxwell Bay where it enters Lake Ontario.

Freshwater wetlands cover 4,162 acres (or 15%) of the Maxwell Creek watershed. Large wetlands, either in the form of swamps (wooded) or marshes (emergent vegetation) are located on a northwest by southeast axis between Centenary and Cheetham Roads, as the Zurich bog in

Arcadia, and between School/South Street, Quarry Road, Rte 241, and Fish Farm Road in Sodus. Much of the floodplain of Maxwell Creek is also characterized as wetland.

Cultivated muck lands, which are generally artificially drained wetland soils, occupy about 1300 acres (4.7%) of the Maxwell Creek watershed. In other words, about half of the floodplain area of the watershed has been converted to cropland, generally with Carlisle muck soils.

Land Use

About 1,560 acres (5.6%) of the Maxwell Creek watershed (27,657 acres) is characterized as developed for residential, commercial or industrial purposes. The developed land is scattered along the roads and highways of the watershed, with an accumulation along the centrally located north-south NYS Rte. 88, especially south of the hamlet of Sodus Center. Most of NYS Rte 104 is not located in the Maxwell Creek watershed. Well distributed agricultural land use accounts for 13,000 acres (about 48%) of the watershed.

Agriculture

Agriculture is an important land use in the Maxwell Creek watershed, with at least 20 farmers working watershed land. About 1300 acres (4.7% of the watershed or 10% of the agricultural land) of the Maxwell Creek watershed, previously freshwater wetlands, have been reclaimed through a system of ditches and drains and are now farmed for a variety of "muckland" vegetable crops. The mineral soils of the watershed are extensively planted to fruit orchards, especially apples. Animal agriculture does not seem to play a large part in the Maxwell Creek watershed, though the land application of vegetable crop processing wastes may play a significant role in the quality of runoff from this area.

Native Vegetation

The Maxwell Creek watershed once had heavy growths of sugar maple, black walnut, northern red oak, basswood, white oak, beech, black cherry, black birch and chestnut on higher, drier ground. The lower, wetter areas supported American elm, red maple, and black and white ash trees plus shrubs such as elderberry, alder and huckleberry. 95% of the watershed was covered with forest, broken only by openings caused by native farmers, fire, flood and wind.

Forests

At the height of clearing for agriculture (1890), probably less than 20% of the watershed's forest remained and all had been cut at least once. At present, 10,739 acres (39%) are characterized as supporting forest growth, though much of the growth has not reached harvestable size.

A more detailed description of the Maxwell Creek Watershed can be found in **APPENDIX I**.

III. Watershed Conditions

Water Quality Standards

NYSDEC indirectly documented the quality of the water in Maxwell Creek in 2004. The Minor Tribs to Lake Ontario, Central are Class C. Maxwell Creek is in the section along the coast of the Lake covered by this characterization. Since this project focuses principally on phosphorous, the applicable water quality standard for phosphorus and nitrogen is presented in the table below.

Parameter	Standard
Phosphorus (and Nitrogen) – Classes B and C	None in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages.

The report states that there are "minor impacts" on all tributaries from Sodus Bay to Pultneyville. The uses impacted are aquatic life and aesthetics caused by nutrients from agriculture and industrial activity.

The Maxwell Creek is currently categorized as a Class C stream. This is defined by NYSDEC as: "*The best usage of Class C waters is fishing. These waters shall be suitable for fish, shellfish and wildlife propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.*"

Maxwell Creek, Summer 2012

Metz Pond, which is about four miles upstream from Lake Road also appears on their list but is "unassessed".

The US Environmental Protection Agency has established a phosphorus water quality standard for flowing streams/rivers entering lakes at 50 µg/L (or 0.050 mg/L) and 100 µg/L (or 0.10 mg/L) for all other streams/rivers.

Wisconsin has established a phosphorus water quality standard for flowing streams/rivers entering lakes at 75 µg/L (or 0.075 mg/L) and 100 µg/L (or 0.10 mg/L) for all other streams/rivers.

Recent work in New York State by A.J. Smith, et.al. (see references) suggests a threshold for nutrient impairment in flowing waters is the boundary between mesotrophic and eutrophic condition in a stream. This translates to approximately 65 µg/L (or 0.065 mg/L) for phosphorus.

<u>Current Watershed Endpoint:</u> The monitoring data collected by CEI and SUNY Brockport indicated that the average concentration of total phosphorus leaving the Maxwell Creek watershed is 233 µg/L (or 0.233 mg/L). This is the average concentration measured during the monitoring conducted on Maxwell Creek in 2010 through 2012.

<u>Desired Watershed Endpoint:</u> CEI decided to use a value of 65 µg/L (or 0.065 mg/L) for phosphorus as the desired watershed endpoint. Compared to existing conditions of 233 µg/L, meeting this endpoint would require a reduction in phosphorus concentration of approximately 168 µg/L or a 72% reduction.

Lake Ontario Tributary Monitoring Data

CEI has been involved with water quality issues in the near-shore waters of Lake Ontario since 2002. During that time CEI has worked with SUNY Brockport to monitor phosphorus concentrations in selected tributaries to the lake and the near-shore areas at those discharge points. The two figures below do not include any data from Maxwell Creek but provide a perspective to the phosphorus contamination associated with the Maxwell Creek Watershed in relation to other streams/rivers along New York's Lake Ontario coast. This data was extracted from: *Physical and chemical characteristics of the nearshore zone of Lake Ontario*, Dr. Joseph C. Makarewicz, et.al.

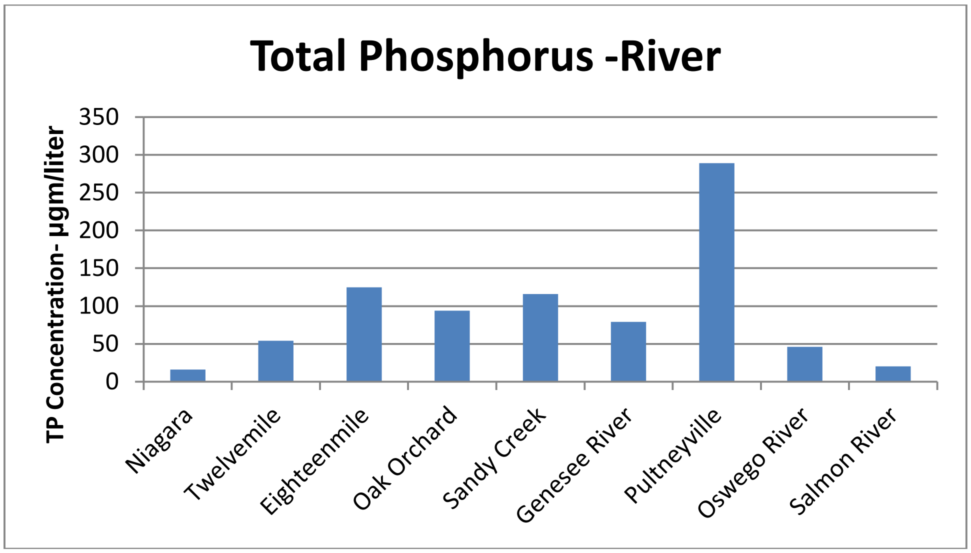


Figure 1: Total Phosphorus in Selected Tributaries, 2006 – 2009

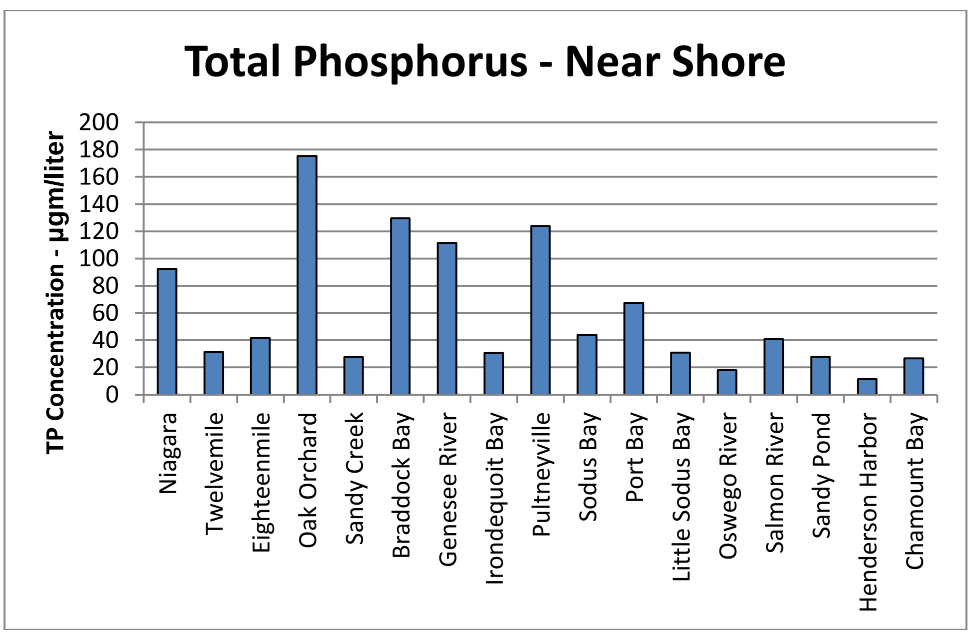
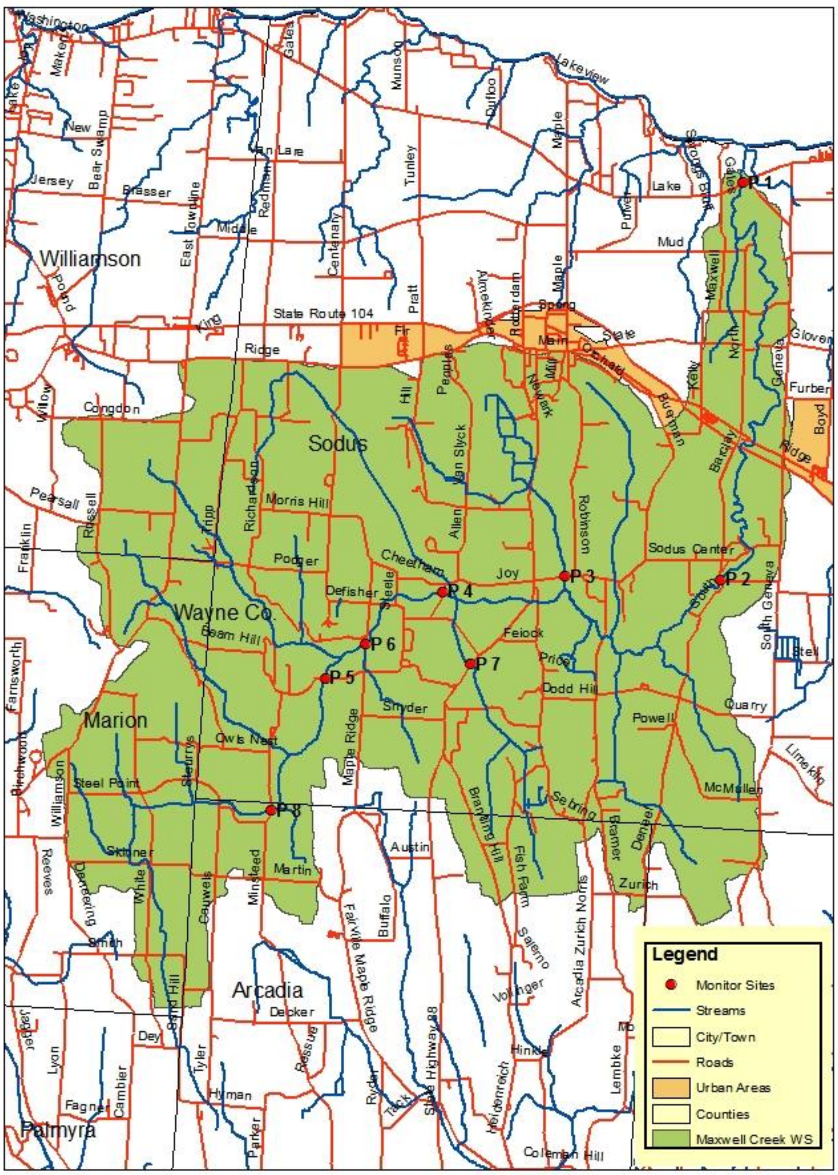


Figure 2: Total Phosphorus in Nearshore Waters, 2006 - 2009

Maxwell Creek Monitoring by CEI

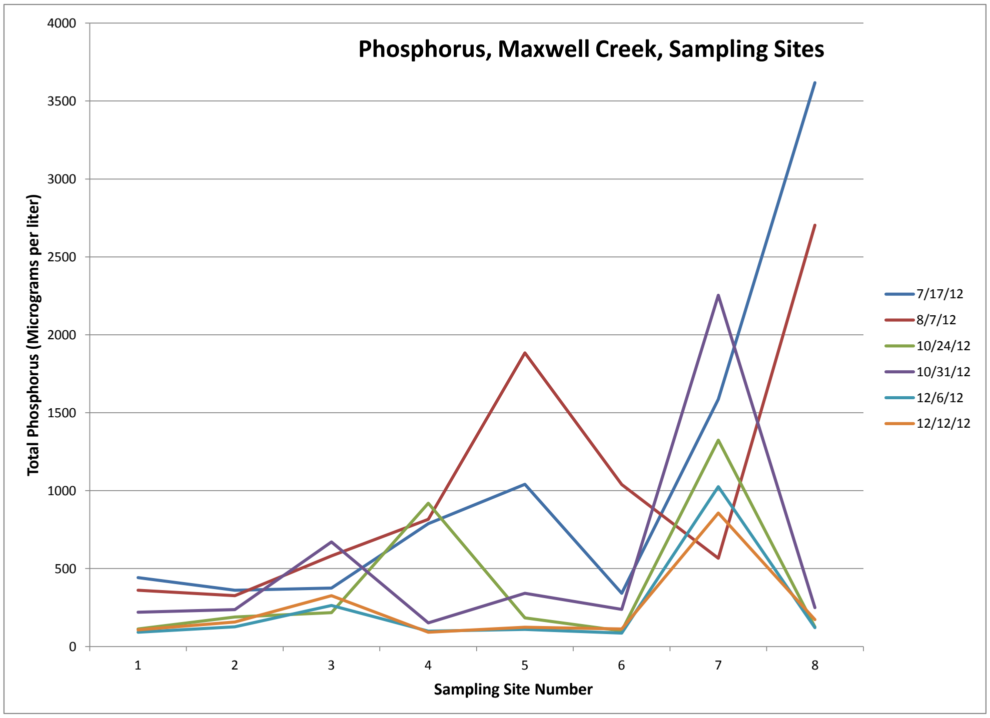
This project funded the collection of samples in this watershed to better characterize the phosphorus contamination in Maxwell Creek at key locations. Samples were taken at the eight locations shown in the map below.

Maxwell Creek Monitor Sites



Map produced by the Center for Envrionmental Initiatives (CEI) Rev. 08-21

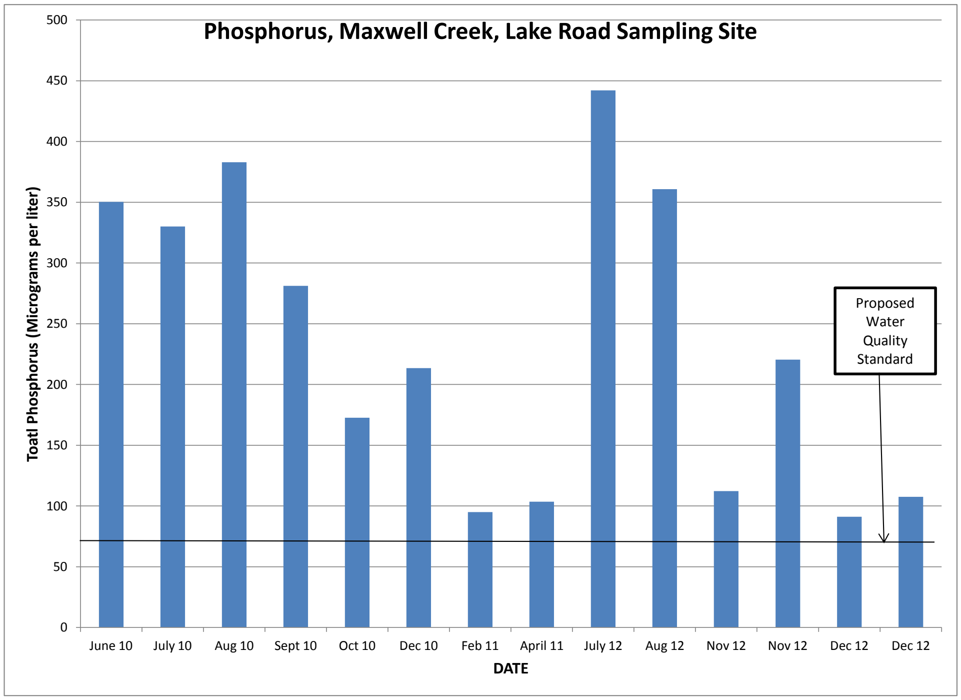
Phosphorus Water Quality Data: The chart below summarizes some of the pertinent total phosphorus data collected in 2012 by CEI. Maxwell Creek was sampled six times at about 8 locations between July 17 and December 12, 2012. Two samplings were conducted during low-flow nonevent conditions and four were during storm events that increased flow. Flows during nonevents were less than 20 cfs. Flows during storm events were between 65 and 93 cfs (immediately after Hurricane Sandy).



Stations 3, 6 and 7 were located either on stretches of Maxwell Creek or Fly Creek, its tributary, where runoff from cultivated muck areas would be part of the samples. Station #3 was never identified as being high in Total Phosphorus content. Station #7 was consistently high in Total Phosphorus (2253 and 1026 ppb during storm flow) and in the latest round of sampling Station 7a located upstream in the middle of the cultivated muck lands off Fish Farm Road registered 1262 ppb Total Phosphorus. Runoff from the mucklands west of Rte 88 were also sampled twice and registered relatively high concentrations of Total Phosphorus: 648 and 736 ppb. On several instances, Stations #3 and #7 also showed high nitrate levels (5 and 22 ppm respectively). During storm events, Stations #3, 5, 6, and 7 showed high Total Nitrogen concentrations (5.8, 5.9, 6.4 and 23.51 ppm) indicating a problem with nitrogen/nitrate pollution in these areas. It should be noted that the two sampling runs in October and two in December did not take place during the growing season, so no direct applications of fertilizer were taking place at the time of sampling.

Maxwell Creek Monitoring by CEI and Others

The chart below summarizes the data collected over the last few years by both the Wayne County Soil and Water Conservation District (2010 and 2011) and CEI (2012) at the sampling site on Maxwell Creek at Lake Road.



Studies carried out in 2010 and reported in 2011 to the Wayne County Soil and Water District showed that Maxwell Creek was the second highest of eight streams surveyed (next to Salmon Creek) in both mean Soluble Reactive Phosphorus (200.2 ug/l) and Total Phosphorus (253 ug/l). Maxwell Creek's SRP and TP loading was particularly high during non-events. Discharge from Maxwell Creek was computed as 110,000 cubic meters of water per day.

Raw Water Quality Information

Wayne County Data, 2010 and 2011

The Wayne County Soil and Water Conservation District (SWCD) took the only other water quality data that could be found. Their samples were taken in 2010 and 2011 at one location which was the same as Sampling Site #1 CEI used in their 2012 sampling (See References). The results of that sampling are summarized in the table below.

Date	Event	Discharge	SRP	TP	Nitrate	TSS
		(m3/day)	(µg P/L)	(µg P/L)	(mg N/L)	(mg/L)
6/7/2010	yes	140,581	241.1	350.3	0.4	8.8
7/6/2010	no	8,547	240.4	330.0	0.1	2.6
8/3/2010	no	40,949	266.4	382.9	0.1	1.1
9/7/2010	no	3,050	281.2	281.2	0.0	0.1
11/1/2010	no	56,338	158.7	172.6	0.3	0.3
12/8/2010	yes	167,621	137.2	213.5	2.8	12.1
2/15/2011	no	304,591	54.1	95.0	1.2	5.7
4/14/2011	yes	162,808	67.5	103.5	0.5	4.4

CEI Special Samples, 2012

Special samples were taken during the last three sampling events to help characterize various aspects of the water quality in the Maxwell Creek watershed. The identification of those samples and the results of the analysis are shown below.

Sample	Date	TP	Nitrate	TSS	SRP	TN	Coliform
Location		(µg P/L)	(mg N/L)	(mg/L)	(µg P/L)	(mg N/L)	CFU/100ml
Meyers Pond	10/24/2012	23.1	0.09	2.5	12.0	2.35	500
Metz Pond	10/31/2012	303.4	0.36	6.4	79.9	0.95	16,700
Mizkan 001	10/31/2012	33.9	0.91	0.6	19.1	1.84	700
Rt. 88 Muck	12/6/2012	647.8	1.17	1.0	621.6	4.09	6,000
Metz Pond Discharge	12/6/2012	126.0	0.84	1.8	72.1	1.52	2,400
Rt. 88 Muck	12/12/2012	736.4	4.55	14.0	678.6	7.62	5,100
Muck Off Fish Farm	12/12/2012	1261.9	4.28	19.1	1046.7	7.24	6,000

CEI Sampling Site Data, 2012

Sample	Date	TP	Nitrate	TSS	SRP	TN	Coliform
Location		(µg P/L)	(mg N/L)	(mg/L)	(µg P/L)	(mg N/L)	CFU/100ml
1	7/17/2012	442.0	0.39	1.8	442.0	1.26	16,400
2	7/17/2012	361.5	0.53	10.0	345.8	1.37	26,600
3	7/17/2012	374.7	0.09	4.6	369.8	1.07	3,600
4	7/17/2012	788.9	0.37	15.3	756.0	1.90	39,100
5	7/17/2012	1040.7	0.09	70.3	366.4	1.77	18,000
6	7/17/2012	341.0	0.89	9.8	330.9	1.95	6,000
7	7/17/2012	1586.6	0.05	885	789.3	7.28	70,000
8	7/17/2012	3618.2	0.05	1300	1333.5	2.50	68,000
1	8/7/2012	360.8	0.18	3.0	322.0	0.83	12,600
2	8/7/2012	326.2	0.15	1.9	292.3	0.73	13,400
3	8/7/2012	582.1	0.03	6.5	497.2	1.02	11,000
4	8/7/2012	815.7	0.24	23.3	703.3	1.43	14,900
5	8/7/2012	1884.7	0.87	5.7	408.2	2.04	5,700
6	8/7/2012	1039.1	0.17	55.5	642.8	2.02	18,700
7	8/7/2012	565.6	ND	73.7	399.5	12.29	38,700
8	8/7/2012	2703.7	ND	17.8	2034.9	2.23	36,000
1	10/24/2012	112.3	ND	2.5	92.3	1.62	2,700
2	10/24/2012	188.8	0.05	2.8	167.9	1.90	1,400
3	10/24/2012	217.6	0.19	3.0	158.5	1.98	9,100
4	10/24/2012	918.8	0.42	2.8	897.0	3.89	3,500
5	10/24/2012	184.1	0.14	3.8	117.1	2.28	4,900
6	10/24/2012	99.7	0.27	4.3	98.0	2.30	15,200
7	10/24/2012	1324.4	0.64	3.2	1078.3	4.14	8,600
8							
1	10/31/2012	220.4	0.23	12.1	147.2	1.21	8,700
2	10/31/2012	237.3	1.69	5.9	173.6	3.10	19,400
3	10/31/2012	671.6	5.35	3.4	438.0	5.76	34,200
4	10/31/2012	151.2	0.64	2.4	127.9	1.36	16,000
5	10/31/2012	341.7	4.16	12.0	197.1	5.94	32,000
6	10/31/2012	237.9	1.82	3.6	178.6	6.42	30,200
7	10/31/2012	2253.3	21.81	0.9	1887.1	23.51	80,000
8	10/31/2012	249.7	3.65	2.9	233.0	5.76	33,900
1	12/6/2012	91.1	0.79	4.9	66.0	1.37	300
2	12/6/2012	126.0	0.66	2.9	69.0	1.45	2,400
3	12/6/2012	262.9	0.91	2.3	235.4	1.81	2,900
4	12/6/2012	98.3	1.01	1.4	79.0	1.82	6,900
5	12/6/2012	110.1	1.48	3.3	70.5	2.68	5,400
6	12/6/2012	85.6	2.74	1.3	58.9	3.35	4,200
7	12/6/2012	1026.1	2.48	5.3	1021.6	4.72	3,100
8	12/6/2012	120.3	1.52	1.8	90.3	2.67	7,600
1	12/12/2012	107.6	0.86	4.8	72.8	1.70	2,200
2	12/12/2012	157.4	1.40	1.3	134.4	2.32	1,900
3	12/12/2012	326.5	1.88	1.3	283.4	3.10	4,000
4	12/12/2012	92.0	1.88	1.0	79.3	3.02	7,100
5	12/12/2012	123.6	2.20	2.0	92.3	3.39	2,100
6	12/12/2012	112.0	2.35	1.3	80.7	3.30	5,000
7	12/12/2012	856.2	5.76	11.5	806.7	9.03	3,300
8	12/12/2012	172.1	2.24	1.3	155.2	3.20	4,100

IV. Pollutant Source Assessment

Non-point sources

Animal Concentrations: No concentrations of farm animals were identified within this watershed though animal waste from outside the watershed may be spread in this watershed. CEI estimated that 250 animal units are located in this watershed. Actual animal counts were not available at the time of this report.

Land Application Nutrients: Nutrients (phosphorus and nitrogen) are applied to the land in various parts of this watershed. There are many acres of farmland that apply nutrients in a variety of ways. Some applications are of commercial fertilizers, some are of manure from dairy operations and some are by-product solids associated with a local food processing operation.

Data was available from NYSDEC on the amount of by-product solids applied by the local food processing plant based upon data from their DEC permit file it was found that 20,000 pounds per year of solids are applied to various plots of land within the watershed. Data was available on the amount of phosphorus in food processing solids at another plant in the area indicates that they contain an average of 24,500 milligrams of phosphorus per kilogram of solids. Using this information CEI estimated that 400 pounds of phosphorus were applied to this watershed from this source each year.

Septic Systems: The number and relative effectiveness of residential wastewater treatment (septic) systems within a watershed can have a significant impact on groundwater and or/surface water quality. Effective septic systems sited too near waterbodies can leach nutrients and pathogens directly into the waterbody before they can be sequestered or treated in the soil. And it has been shown that the effluent from a malfunctioning system can be informally conducted ("short circuited') much closer to or directly into a water body. The *MapShed* model utilizes information on the estimated septic system population and various failure modes in its calculations.

CEI estimated the number of people served by septic systems in the Maxwell Creek watershed by taking the most recent census tract data with information on household wastewater systems (1990 census) and proportionally clipping it down to the watershed boundaries. This yielded a population served by septic systems to be 2,239 people.

Following methodology of earlier studies conducted by CEI for the NYSDEC, CEI projects that a total of 427 people (19%) in the Maxwell Creek watershed use septic systems that are substandard. This overall percentage is similar to that reported from surveys in other states.

Understanding the likely failure modes is also important. The *MapShed* model provides for the following categories of substandard septic systems: direct discharge (i.e., piped directly to surface waters), short-circuiting (i.e., close proximity to surface/ground waters not allowing full treatment), and ponding (i.e. discharge to ground surface). Based on previous TMDL studies in NY, and utilizing its best judgment and understanding of the watershed, CEI estimated the breakdown of septic system conditions below.

Condition	Number of People Served	Percent of Total
Normal	1,812	81
Ponded	68	2.9
Short Circuited	354	15.8
Direct Discharge	5	0.3
TOTAL:	2,239	100

Point Sources

One NYS-permitted point source was identified in this watershed. This plant runs year-round and has a New York State Department of Environmental Conservation (NYSDEC) SPDES permitted land application operation designed to primarily remove BOD and solids. Phosphorus does not appear on their permit to discharge as is the case with most wastewater discharges in New York State.

CEI assumed that this operation uses industrial grade detergents to clean their processing equipment which contain phosphorus. Information was not available on the phosphorus content of their effluent from the permit file at NYSDEC regional headquarters in Avon, NY. CEI used data available from a near-by food processing operation to estimate the phosphorus content of their effluent.

V. Pollutant Loads and Water Quality

Models provide an approach for estimating loads, providing source load estimates, and evaluating various management alternatives. A model is a set of equations that can be used to describe the natural or man-made processes in a watershed system, such as runoff or stream transport. By building these cause-and-effect relationships, models can be used to forecast or estimate future conditions that might occur under various conditions. Models can be highly sophisticated, including many specific processes such as detailed descriptions of infiltration and evapotranspiration. Models can also be very generalized, such as a simple empirical relationship that estimates the amount of runoff based on precipitation. Some models are available as software packages, whereas simple models or equations can be applied with a calculator or spreadsheet. Compared to the simple approaches models add more detailed procedures that represent the separate processes of rainfall, erosion, loading, transport, and management practices. By separately addressing each process, models can be adapted to local conditions, and the simulation can be made more sensitive to land use activities and management changes.

When considering model inputs, nonpoint sources are a significant contributor to water quality impacts in New York State. Nonpoint sources typically account for as much as 90% of the major sources contributing to water quality impacts for rivers and streams. There is an increasing focus on efforts to develop tools and methods to identify and quantify nonpoint source pollutant loads. While long-term surface water monitoring is the most effective technique for determining the extent and magnitude of nonpoint source pollutant loading, resource constraints have prompted the development of other techniques, such as computer-based simulation models, to supplement monitoring efforts. Water quality models are frequently used for assessing pollutant loading.

Model Selection: It is important to maintain a proper compatibility between model complexity and data availability and knowledge. For example, a more complex watershed model, with a distributed spatial resolution and mechanistic representation of hydrological processes, would likely require more detailed data on flow, land use, topography, and physical characteristics of the sub-basins compared to a simpler, lumped model. Similarly, a receiving water model with a high level of mechanistic complexity should be supported by adequate spatial and temporal water quality, flow, and loading data to allow for defensible model parameterization. In the absence of comprehensive data, a simpler, or less mechanistic, model may be more appropriate. This type of model would focus on the known processes and make use of available data and local knowledge to the fullest extent possible.

Establishing the relationship between watershed source loading and in-stream water quality is a critical component of Watershed Action Plan (WAP) development. It allows for the evaluation of management options that can achieve the desired source load reductions. This link can be established through a range of techniques, from qualitative assumptions based on sound scientific principles to sophisticated modeling techniques. This project used a linked watershed-water quality model. The following criteria were used for model selection:

- Level of complexity and compatibility with available data;
- Ability to meet all modeling objectives;
- User-friendliness;

- Track record and acceptance in the scientific and engineering communities; and
- Availability of model(s) and model source code.

For the watershed runoff, the model must be able to simulate the loading and delivery of phosphorus from the target watersheds. Watershed loadings are closely tied to hydrology and land use practices, therefore, adequate hydrological representation must be included in the model. Explicit assessment of watershed pollutant sources will also be required. The ability to adequately delineate the watersheds spatially will be an important screening criterion. A model that can incorporate the impacts of urban, rural, and agricultural practices in the watershed is also desirable.

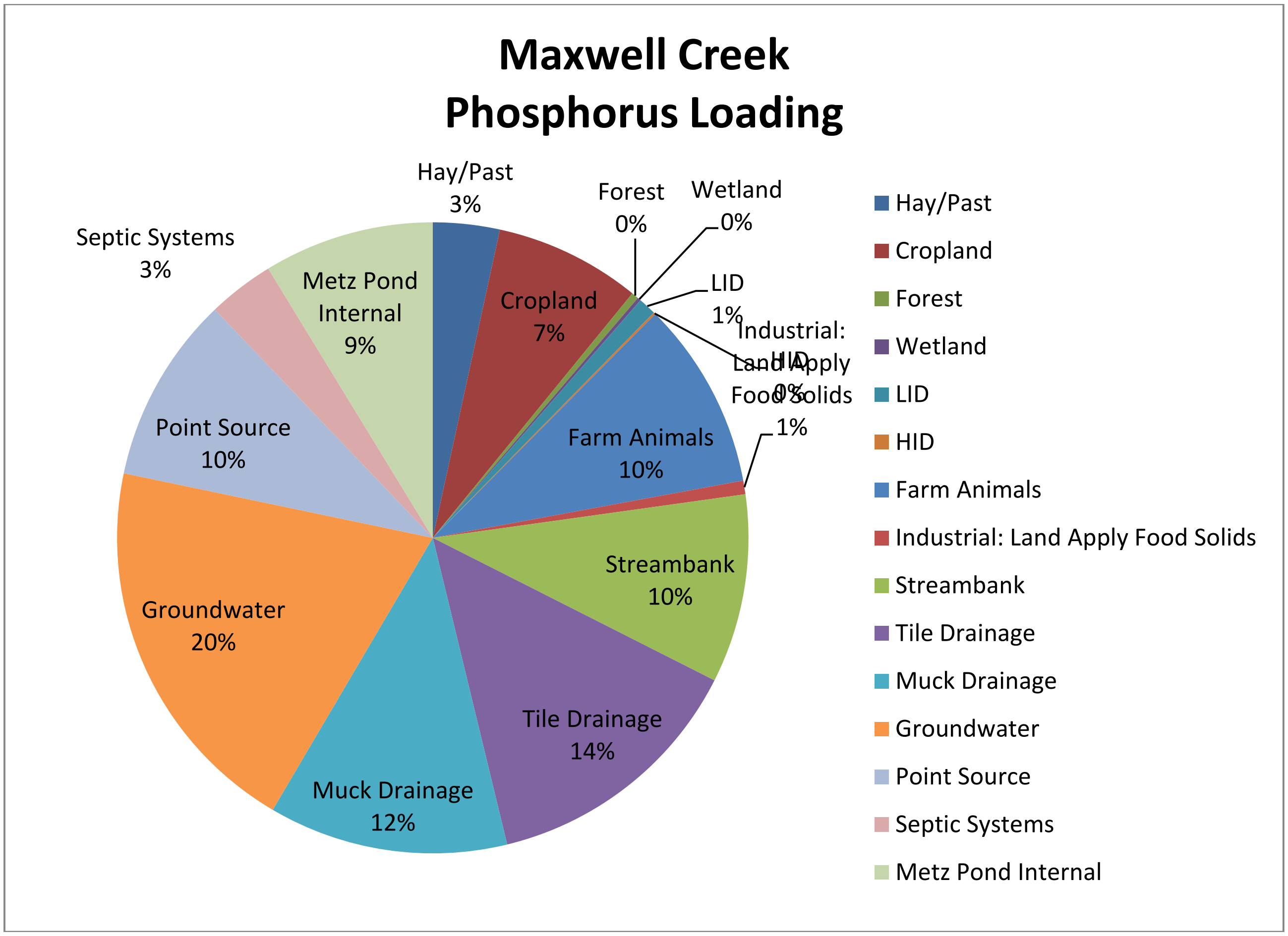
Ease of use of the model(s) will be an important screening criterion. Since the model will be used for WAP analyses that will be presented to the public for comment, a visually appealing model with easily edited inputs and illustrative output capabilities is preferable. Compatibility with GIS software is also desired. The selected model should have a proven track record and be accepted by EPA and the scientific community. Public domain models with open source code are desirable.

CEI has extensive experience using the *AVGWLF* Version 7.2.3 (ArcView Generalized Watershed Loading Function, http://www.avgwlf.psu.edu/) for a two-year water quality project for NYSDEC in 2010 and 2011. However, during the later part of 2011, CEI worked with Penn State University to switch over to using their *MapShed* model for this project (http://www.mapshed.psu.edu/). The description below was taken from this site.

> For more than a decade, Dr. Barry Evans and his group at PSIEE have been improving *AVGWLF*. To extend the utility of this software, a major revision was recently undertaken to move the tool from a commercial GIS software package to a free one called MapWindow (see www.mapwindow.org). It is believed that this new software, called *MapShed*, will expand the use of this type of modeling tool to a much larger number of users, many of whom do not have the means to purchase the commercial GIS software needed for *AVGWLF*. In addition to the GIS platform upgrade, numerous analytical tools have been enhanced to provide additional modeling capabilities such as the simulation of pathogen loads, better simulation of pollutant transport processes in urban settings, and improved assessment of the effects of best management practice (BMP) implementation on pollutant load reduction.
>
> Like *AVGWLF*, *MapShed* is a customized GIS interface that is used to create input data for an enhanced version of the GWLF watershed model originally developed at Cornell University. In utilizing this interface, the user is prompted to identify required GIS files and to provide other information related to “non-spatial” model parameters. This information is subsequently used to derive values for required model input parameters which are then written to the input file needed for model execution. Also accessed through the interface is regional climate data stored in Excel-formatted files that is used to create the necessary “weather” input file for a given watershed simulation. With *MapShed*, a user selects areas of interest, creates model input files, runs the simulations model, and views the output in a series of seamless steps.

Modeling Approach: CEI built a *MapShed* model for the Maxwell Creek watershed. The table below summarizes the results of the baseline run of the model. It identifies aggregate sources of phosphorus in the Maxwell Creek watershed and their approximated contribution to the whole watershed phosphorus load.

Major Source Category	**Sub-Category**	**Phosphorus Load**	**Percent of Total**
		(Pounds/year)	(%)
Agriculture	Hay/Pasture	254	3.4
	Cropland	557	7.5
	Tile Drainage	1,024	13.8
	Muck Drainage	912	12.2
	Farm Animals	718	9.6
Forest/Other	Streambank	720	9.7
	Wetland	13	0.2
	Groundwater	1,476	19.8
	Forest	27	0.4
	Metz Pond Internal	650	8.7
Industrial	Permitted Point Source	714	9.6
	Permitted Land Application	52	0.7
Urban Stormwater	LID*	68	0.9
	HID**	8	0.1
Septic Systems	Septic Systems	253	3.4
	TOTAL:	**7,446**	100.0
*	Low Intensity Development		
**	High Intensity Development		


Maxwell Creek
Phosphorus Loading
Hay/Past 3%
Cropland 7%
Forest 0%
Wetland 0%
LID 1%
HID 0%
Industrial: Land Apply Food Solids 1%
Farm Animals 10%
Streambank 10%
Tile Drainage 14%
Muck Drainage 12%
Groundwater 20%
Point Source 10%
Septic Systems 3%
Metz Pond Internal 9%
Hay/Past
Cropland
Forest
Wetland
LID
HID
Farm Animals
Industrial: Land Apply Food Solids
Streambank
Tile Drainage
Muck Drainage
Groundwater
Point Source
Septic Systems
Metz Pond Internal

VI. Watershed Goals

Objectives

The findings of this watershed characterization suggest that elevated phosphorus levels in Maxwell Creek contribute to unwanted plant growth in Maxwell Bay and stresses the fishery in Maxwell Creek. Based upon those findings the Maxwell Creek Watershed Coordinating Committee has adopted the Objectives listed below.

Objective	Indicators
Stream water quality supports intended uses as described by Class C categorization.	• Total phosphorus in stream • Phosphorus load reductions
Less undesirable plant growth in Maxwell Bay	• Total phosphorus in stream • Phosphorus load reductions
Improved fishery in Maxwell Creek	• Miles of fishable stream

Targets

The monitoring data collected by CEI and SUNY Brockport indicated that the average concentration of total phosphorus leaving the Maxwell Creek watershed is 233 µg/L (or 0.233 mg/L). This is the average concentration measured during the monitoring conducted on Maxwell Creek in 2010 through 2012.

CEI decided to use a value of 65 µg/L (or 0.065 mg/L) for phosphorus as the desired watershed endpoint. Compared to existing conditions of 233 µg/L meeting this endpoint would require a reduction in phosphorus concentration of approximately 168 µg/L or a 72% reduction. The targets listed below were established based upon this information.

Objective	Target
Stream water quality supports intended uses as described by Class C categorization.	Reduce phosphorus loading to stream by 72% by 2022
Less undesirable plant growth in Maxwell Bay	No unwanted plant growth in Maxwell Bay by 2022
Improved fishery in Maxwell Creek	Maxwell Creek is fishable up to Metz Pond

VII. Management Strategies

The modeling results discussed earlier demonstrate that 41% of the phosphorus loading in this watershed is associated with tile-drained farmland (muckland farms and others), Metz Pond internal load, and food processing plant effluent. Based upon the impairments discussed earlier, stressed stream, excess plant growth in Maxwell Bay and a stressed fishery in Maxwell Creek, the Committee was able to settle on six areas of improvement:

1. Minimize fertilizer application rates for tile drained farmland that use the minimum amount of phosphorus needed for proper plant growth;
2. Consider the application of diversion and sub-irrigation technology, and adequate outlets to the muckland farms;
3. Reduce the internal phosphorus load from Metz Pond;
4. Characterize food processing plant effluent to better assess their impact on stream quality;
5. Evaluate conservation buffer uses, varieties, species, and techniques; and
6. Evaluate the removal of the small dam on Maxwell Creek about one-half mile upstream of Lake Road to expand the Maxwell Creek fishery.

<u>Muck Farmland Nutrients:</u> Nutrient inputs from muck drainage could be reduced by special muck conservation programs that would include such measures as balancing nutrient inputs with crop outputs (through soil testing) and maintaining the muck acreage in a flooded condition when not in production through the operation of dikes and weirs.

<u>Sub-irrigation of Drained Farmland:</u> Nutrient inputs from any artificially drained cropland could also be reduced through the storage and re-application as irrigation of water drained from the fields through channels or tile drainage.

<u>Metz Pond Internal Load:</u> Our computer model estimates that the release of phosphorus from sediments in Metz Pond could contribute 9% of the loading reaching Lake Ontario from Maxwell Creek. The samples taken during summer months (7/17 and 8/7) under low-flow conditions and taken during the fall (10/24, 10/31, 12/6, and 12/12) during event-driven conditions, suggest that Metz Pond is playing a role in increasing the discharge of Total Phosphorus from the Maxwell Creek watershed. Details on that role require more testing and a better description of the holding capacity and interior dynamics of Metz Pond. Metz Pond was tested on 10/31 and found to have a moderately high TP concentration (303.4 ppb). Other samples taken at other times, upstream and downstream of Metz Pond always indicated a higher level of TP downstream than upstream. Whether Metz Pond becomes stratified and anoxic in the bottom layers during summer months needs to be verified by testing and will be a function of depth, temperature, and exposure to winds and flows. If it does, stores of phosphorus deposited in bottom sediments may become available and dissolved into the waters of Metz Pond. Even if the pond doesn't stratify, significant winter and flow events could result in the re-suspension of sediments and associated attached phosphorus in the water column.

Remediation options for Metz Pond depend on its physical characteristics and flow regime, which are largely unknown. If its bottom sediments are stable and the pond stratifies in the summer months with an anoxic layer at the bottom, treatment with alum to stabilize and "seal" the sediments should be considered.

Regulated Point Source: CEI obtained information about the effluent from this operation from the NYSDEC files in Avon, NY. These files did not contain any information about phosphorus content in their effluent or use of phosphorus-containing detergents. Information from a near-by food processing operation was extrapolated to this operation.

Streambank Buffers: Given the large groundwater component, which in sandy soils is fed by inputs from farm animals, cropland, hay/pasture, septic systems and land applied solids, the best remediation practices would decrease many of these inputs to groundwater. A program of setbacks, fencing and stream buffers, for example, would reduce all the sources mentioned above plus that input associated with streambank erosion. Deep-rooted buffer trees and shrubs would reduce nutrient concentrations in groundwater heading toward discharge into streams by capturing the nutrients and using them in growing vegetation. Rooted buffer vegetation would also help to stabilize stream banks, limiting losses of nutrients and sediments, and shade cooler waters.

Habitat Improvement: Maxwell Bay and Maxwell Creek as far south as Lake Road (about ¼ mile from the lake) already supports a thriving trout fishery and is heavily fished. As verified by our season of tests, Maxwell Creek seldom runs muddy- the Total Suspended Solids concentrations under both event and nonevent conditions are very low. The stretch of stream available for trout reproduction is limited, however, by a nonfunctioning hydropower dam about ½ mile south of the lake. Maxwell Creek in the stretch below Metz Pond is a steep gradient, stony bottomed, deeply incised, and shaded stream. It appears to have high potential as trout habitat if the trout could only reach it. Either removal of the lower dam or construction of a bypass for trout would result in several more miles of trout spawning grounds, more fish and improved fishing. Little else would be needed to be to improve fish habitat since regular flows of shaded, clear and cool water in a pattern of pool and riffle already exists in Maxwell Creek.

Metz Pond is located at an elevation of 394 feet above mean sea level (msl) about 4 miles south of Lake Road (Station #1). Lake Ontario's long term average elevation is 246 feet msl. Allowing for sinuosity, use a length of 23,760 feet as stream length and subtract 15 feet as the height of the Ontario Center dam for a fall of 133 feet between the pond outflow and Lake Ontario. The average gradient over this 4-mile reach of Maxwell Creek would be .0056 ft/ft or nearly 0.6 foot/100. The stream itself alternates between pool and riffle, producing good trout habitat. Maxwell Bay and Maxwell Creek as far south as Lake Road (about ¼ mile from the lake) already supports a thriving trout fishery and is heavily fished.

The stream is lined with mature and decadent Black willows (*Salix nigra*), one of the largest native trees of the area. The Black willows not only provide shade to the stream but their growth pattern (reaching 60-80' in height, then breaking down under wind/ice stress to lie in the stream and throw up new growth) helps to develop stream "structure" and provide refuges and woody debris in the stream.

Though Maxwell Creek below Metz Pond generally lies in a 20-30 foot deep incision in the landscape, the reach between Christian Holler Road and Newell Road forms a scenic “gully” 60-70 feet deep.

The stretch of stream available for trout reproduction is limited, however, by a nonfunctioning hydropower dam about ½ mile south of the lake. Though the lower dam was constructed to detain 12-15 feet of water in a millpond, it no longer retains any water but only causes some slack water above it (Image #1 and Image #2). The dam structure has been removed so that only wingwalls and three three-foot lifts remain, at least one of which may be a bedrock, not a built, structure (Image #3). Knowledgeable local fishermen state that no salmonids are to found upstream of the third lift.

The three lifts don’t appear to present an obstacle to salmonid movement, but it may be that the lack of a sufficient pool between the first and second lift makes it impossible for them to scale the whole structure. If this is the case, it appears that relatively minor structural work on the north end of the lifts would create a passage.

Our season of tests indicates Maxwell Creek seldom runs muddy- the Total Suspended Solids concentrations under both event and nonevent conditions are very low. Maxwell Creek in the stretch below Metz Pond is a steep gradient, stony bottomed, deeply incised, and shaded stream. It appears to have high potential as trout habitat if the trout could only reach it. Construction of a bypass for trout migration would result in several more miles of trout spawning grounds, more fish and improved fishing. Little else would be needed to be to improve fish habitat since regular flows of shaded, clear and cool water in a pattern of pool and riffle already exists in Maxwell Creek.

Image #1: Maxwell Creek, Three Lifts

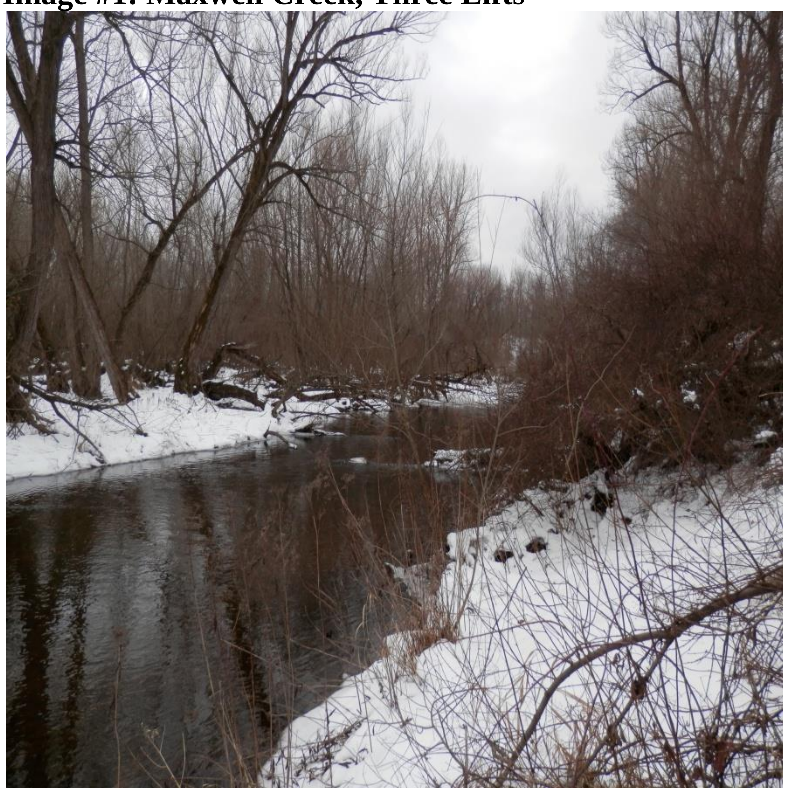


Image #2: Maxwell Creek, Upstream of Dam

Image #3: Maxwell Creek, Old Dam Structure, Above Lifts

VIII. Implementation

Schedule of Activities and Milestones

Muck Farmland Nutrients: This project involves the evaluation and selection of appropriate muck farmland fertilization to keep the amount of phosphorus at a minimum for plant growth. The Orleans County Cornell Cooperative Extension has developed and documented such a process (See References – Cropland). The table below details the activities associated with this project.

Activity	2013	2014	2015	2016	2017
Investigate options					
Select best option					
Bring farmers on board					
Apply for funding if necessary					
Secure funding					
Implement project					
Evaluate effectiveness					

Sub-Irrigation of Drained Farmland: This project involves the evaluation and selection of appropriate drained farmland water table management. The USDA has documented the efficacy of this process and their results could be used to select an approach. The table below details the activities associated with this project.

Activity	2013	2014	2015	2016	2017
Investigate options					
Select best option					
Convince farm to pilot option					
Apply for funding for pilot					
Secure funding					
Implement project					
Evaluate effectiveness					
Decide on further implementation					

Metz Pond Internal Load: This project requires that a definitive quantification of the internal load associated with Metz Pond and its bathymetry. Once this is known options can be evaluated.

Activity	2013	2014	2015	2016	2017
Conduct Evaluation					
Investigate options					
Select best options					
Prepare cost estimate					
Apply for funding					
Secure funding					
Implement project					
Evaluate effectiveness					

Permitted Industrial Point Source: The project requires cooperation from Mizkan Americas, Inc. to collect and analyze plant effluent samples based upon their production cycle. Once the data is available the impact of their effluent on Maxwell Creek water quality can be evaluated. The need for further action can also be identified.

Activity	2013	2014	2015	2016	2017
Solicit info from Mizkan					
Collect further data					
Evaluate results					
Determine next steps					
Agree on next steps					
Implement project					
Evaluate effectiveness					

Streambank Buffering: This project involves the identification of stream segments that are amenable to streambank buffering, implementation of one phase, evaluation of that implementation and deciding on further implementation.

Activity	2013	2014	2015	2016	2017
Investigate options					
Select best option(s)					
Apply for funding for Phase I					
Secure funding					
Implement project					
Evaluate effectiveness					
Decide on further implementation					

Habitat Improvement: The project requires an evaluation of the impact of the removal of this dam on the Maxwell Creek fishery. An estimate of the cost to remove the dam will be needed.

Activity	2013	2014	2015	2016	2017
Conduct Evaluation					
Investigate options					
Select best option					
Prepare cost estimate					
Apply for funding					
Secure funding					
Implement project					
Evaluate effectiveness					

Measures of Progress

Objective	Target	Measure
Stream water quality supports intended uses as described by Class C categorization.	Reduce phosphorus loading to stream by 75% by 2020	Number of phosphorus reduction projects implemented
Less undesirable plant growth in Maxwell Bay	No unwanted plant growth in Maxwell Bay by 2022	Same as above
Improved fishery in Maxwell Creek	Maxwell Creek fishable up to Metz Pond	Phosphorus water quality

Education and Outreach Activities

A public education program focusing on Salmon Creek as an important asset to the area, impairments of that asset, sources of the impairments, and the need for restoration should be undertaken by a group that includes Town leaders, County agencies, stakeholders, and concerned private citizens.

Objective	Activities
Stream water quality supports intended uses as described by Class C categorization.	• Public meetings on progress • Watershed signs
Less undesirable plant growth in Maxwell Bay	• Articles in newsletters • Press releases
Improved fishery in Maxwell Creek	• Press releases • Articles in newsletters

Monitoring Approach and Evaluation Framework

The application of the remediation projects above will not result in the watershed meeting the water quality endpoint. Every effort will be made to conduct a disciplined implementation of remediation projects to begin the process of meeting the desired water quality endpoint.

An adaptive management approach will be used by the Maxwell Creek Watershed Coordinating Committee that implements the most cost-effective measures first while monitoring the water quality impact to see if more should be done.

Water quality sampling will be conducted in a manner that provides sufficient date to evaluate the effectiveness of the implementation of phosphorus and bacterial load reduction projects. The sampling will be conducted each year and will involve at least 6 sets of samples in the stream at Lake Road and 2 sets of screening samples at all 8 sampling sites. This will be coordinated by the Wayne County Soil and Water Conservation District.

Other Considerations

Because the majority of the Maxwell Creek watershed falls within the Town of Sodus, Sodus's "home rule" powers of land use regulation can play a major role in the restoration of Maxwell Creek's water quality. In particular, the Town's zoning regulations should include setbacks for development activities near streams and stipulate erosion control and stormwater management practices consistent with NYS regulations and federal MS4 considerations.

The Town's management of existing infrastructure of roads, sewer and water and their expansion can play an important role in achieving water quality improvements. An active program of monitoring and repairing private wastewater treatment (septic) facilities is also within the purview of the Town's powers.

Expertise to guide the restoration of Maxwell Creek's water quality exists within Wayne County agencies already tasked with environmental improvements, including the Soil and Water Conservation District, the Planning Department, Cornell Cooperative Extension, and the Regional Office of the NYS Department of Health.

New York State programs developed by the Departments of State (Coastal Management), Agriculture and Markets (AEM), Environmental Conservation and Health could also supply both expertise and funding.

If classified as an impaired stream on the 303(d) list, the Maxwell Creek watershed would become eligible for further study, development of formal remediation strategies, and funding to assist in carrying these strategies into action. Though NYS lacks a numeric standard for Total Phosphorus concentrations in stream water, Maxwell Creek far exceeds the various standards under consideration for adoption by NYS as that standard, which ranges from 20 to 100 ppb. In addition, the recent listing of Lake Ontario's coastline as impaired due to excessive nutrients, especially phosphorus points to the influence watershed sources of phosphorus such as Maxwell Creek Remediation of Lake Ontario's coastal waters will necessitate remediation of watershed sources such as Maxwell Creek.

Implementation of these remediation projects will require the cooperation of municipal leaders, county and state agencies, and private citizens living and working in the Salmon Creek watershed. These projects are not without costs, and special funding will need to be found and dedicated to their implementation, to both defray upfront costs and to demonstrate their effectiveness as integrated with other activities.

An ongoing water quality monitoring program for Maxwell Creek will be necessary to guide implementation, track water quality changes affected by the implementation of best management practices and to apply adaptive management principles, especially targeting of resources, to the process.

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APPENDIX I: WATERSHED DESCRIPTION DETAILS

All of the information in this Appendix I was extracted from the following document:

> ***Town and Village of Sodus***
> ***Wayne County, New York***
> ***Comprehensive Plan***
> **Adopted 2005/2006**

NOTE: All of the Maps referenced in the text below are provided at the end of this Appendix.

Land Use

Regional Orientation

The Town of Sodus is located in the north-central portion of Wayne County. It is bordered by the Towns of Huron and Rose to the east, Williamson and Marion to the west, Arcadia and Lyons to the south, and Lake Ontario to the north. The City of Rochester is located approximately 25 miles west of the Town. The Village of Sodus is located in the central portion of the Town. (See *Map 1: Regional Orientation.)* Route 104 and Ridge Road are major east-west thoroughfares that bisect the Town through the center. NYS Routes 88 and 14 are the major north-south routes. The Village of Sodus is located immediately south of Route 104. Ridge Road and NYS Route 88 pass through the Village of Sodus. The Hamlets of Alton and Wallington are located along Ridge Road east of the Village of Sodus. Sodus Center is located southeast of the Village of Sodus. The historical settlements of South Sodus and Joy are located in the southern portion of the Town.

Existing Land Use – Town

The existing land uses are depicted on *Map 2: Town of Sodus Land Use Property Classifications*. The land use classifications shown on the map are based on 2004 tax parcel records. Parcels used primarily for agriculture predominate in the Town, occupying 21,547 acres and 54% of the Town's land area. The majority of the farm parcels are orchards. Natural features in the Town include wetlands, streams, woodlots and the Lake Ontario shoreline. A total of 1,893 parcels in the Town are residential. More than 90% of these (1,776) are single-family dwellings or individual manufactured homes. Eleven manufactured home parks are located in the Town.

Commercial and industrial business uses are located primarily along Route 104 and Ridge Road. Mining and excavation operations are located in the south-central portion of the town. Descriptions and analysis of businesses in the Town are presented in the Economic Development chapter. Land used for transportation and utilities include highways, railroads, and telecommunications facilities. Information and analysis of these facilities and services are presented in the Transportation and Infrastructure section of the Plan. Government and community service facilities in the Town include the Town Hall, Highway Department, fire stations, cemeteries and private recreational facilities.

Hamlets

The Town's historic hamlets represent unique environments for residences and businesses. The Hamlet of Sodus Center, located southeast of the center of the Town, consists of approximately 40 houses, two churches, a fire station and a small park. A food processing industry and three businesses are located just north of Sodus Center. The Hamlet of Alton is located along Ridge Road in the eastern portion of the Town. This hamlet consists of approximately 70 houses, an apartment building, a home for the aged, a mobile home park, and a small business district. Public and community service uses in the hamlet include two churches, a fire hall and a cemetery. The Hamlet of Wallington is located along Ridge Road at the former junction of two railroads, approximately two miles east of the Village of Sodus. This hamlet includes approximately 20 residences, a manufactured home park, approximately 10 businesses, a go-kart racetrack and the Wallington Fire Department.

<u>Existing Land Use – Village</u>

The existing land uses are depicted on *Map 3: Village of Sodus Land Use Property Classifications*. Of the1,589 parcels in the Village, 512 are used for residential purposes. According to recent tax parcel data, there are 427 single family dwellings, 44 two-family dwellings, six 3-family dwellings, and 21 apartment buildings in the Village. Additional information is presented in the Housing & Residential Neighborhoods chapter. A large wetland regulated by the NYS Department of Conservation is located in the northwestern portion of the Village between Rotterdam Road and Belden Avenue. Smaller areas of regulated wetlands are located in the southeast section east of Gaylord Street and north of Robinson Road, and in the area northeast of Foley Drive in the northwestern part of the Village.

The downtown business district occupies the central portion of the Village, generally between Belden Avenue on the west and Gaylord Street on the east. Most of the Village's 56 commercial parcels are located downtown. Others are located along Main Street to the east and west of downtown. WCTS Credit Union occupies a large parcel in the southern portion of the Village. Several churches are located in the downtown area and elsewhere along Main Street. Public service uses located downtown include the Town and Village Hall, the public library and the post office. The Town Highway garage is located on the west side of Belden Street south of the railroad. A portion of the Sodus Central School property and the Sodus Cemetery are located in the Village. A fire station is located on the east side of Mill Street. These facilities and related issues are addressed in the Parks, Recreation, and Government Services chapter. Most of the industrial and storage uses in the Village are located along the railroad. Land used for transportation and utilities include highways, railroads, and telecommunications facilities.

Natural Resources

<u>Lake Ontario and Sodus Bay</u>

The Town of Sodus, outside of the Village of Sodus Point, has approximately 6.8 miles of shoreline along Lake Ontario and 1.6 miles along Sodus Bay. Along the Lake Ontario shoreline east of the Village of Sodus Point, approximately two-thirds of the shoreline has been developed into seasonal or year-round residences. The shoreline along Sodus Bay and Briscoe Cove, located east of the Village of Sodus Point, is predominantly developed with year-round and seasonal residences. (see Map 2: Land Use.) Undeveloped shoreline includes 160 acres of State-owned land with 0.7 miles of shoreline and large agricultural parcels with Lake frontage.

Watercourses and Drainage Basins

Surface water runoff within the Town of Sodus generally flows from south to north. All of the stormwater in the Town of Sodus discharges to one of the main creeks or one of its tributaries, eventually discharging to Lake Ontario.

The four drainage basins or watersheds associated with the major streams in the Town are depicted in *Map 10: Watercourses and Watersheds.* Maxwell Creek (also known as Salmon Creek) originates in the northeastern portion of the Town of Marion. It flows across the southern and eastern portion of the Town of Sodus, through Metz Pond, and into Lake Ontario at the former Camp Beechwood. Second Creek flows from the southeastern part of the Town into Sodus Bay, just east of the Village of Sodus Point. The other streams in the Town are tributaries of Maxwell Creek or Second Creek or are small streams that flow directly into Lake Ontario or Sodus Bay.

Wetlands

Wetlands provide unique habitat for wildlife and plants. They also assist with flood control by storing a large quantity of stormwater. The locations of wetlands mapped by State and Federal agencies are depicted in Map 11: Regulated State and Federal Wetlands. In the Village of Sodus, a regulated wetland located between Rotterdam and Beldon Street limits the future development potential of this area. Two wetlands northeast and northwest of the Village limit development potential in these areas that adjoin Route 104. Other wetlands are located throughout the Town, primarily along stream corridors.

Topography

The topography of the Town of Sodus is depicted in *Map 12: USGS Contour Elevations.* This map shows that elevations are highest in the southwestern part of the Town, with areas of gently sloping land closer to Lake Ontario and Sodus Bay.

Woodlands

Woodlands are found scattered throughout the Town and contribute to the rural character. Nearly all of such lands consist of regrowth following logging decades ago. However, there may be some isolated pockets of “old growth.”

Mineral Resources

A dolomite quarry operated by Hansen Aggregates is located south of Sodus Center on Quarry Road. This mine is operating under a NYS DEC permit that will expire in 2009. The permit allows mining of 112 acres, with 231 acres proposed to be mined over the life of the mine. The dolomite, also referred to as "dolostone", is used to make crushed gravel for use in road construction.

The Town of Williamson owns a 35-acre sand and gravel mine on Centenary Road and south of Rodger Road in the southwestern portion of the Town. The following table lists the mines in the Town of Sodus that are currently permitted by the NYS DEC. A permit to the Sodus Lime and Stone Company for a limestone quarry is currently (April 2005) pending.

Stormwater Drainage

Proper stormwater drainage in the Town of Sodus is challenging due to the low relief and poorly drained soils found in the Town, as well as the disruption to natural drainage patterns that has resulted from the past mining of iron ore. This has resulting in flooding and ponding in some areas.

Septic Systems

On-site septic systems rely on soil and its natural bacteria to filter and process the pathogens and nutrients in wastewater. When they are working properly, such systems are highly effective. Failing systems, however, can introduce pathogens to groundwater, streams and Lake Ontario.

Sedimentation and Erosion

Sediments that are carried into streams and the lake affect the clarity of the water and compromise fish habitats. In addition, the sediments may contain contaminants that degrade the quality of water. Erosion occurs naturally along streambanks and the lakeshore, as thewater scours the banks along bends in the streams. Natural vegetation helps to slow erosion, as roots hold soil in place. When natural vegetation is removed, streambanks and the lake- shore are highly vulnerable to erosion and sedimentation. Erosion and sedimentation also occur during construction, as soil is exposed to rain. Roadside ditches also contribute sediments to the lake as stormwater scours the bottom of the ditch. In areas of steep slopes, erosion can be accelerated.

Sensitive Natural Areas

Sensitive natural features in the Town include wetlands, woodlots, and stream corridors. These areas provide wildlife habitat and contribute to the ecological diversity of the Town and region. Several areas of the Town, along the lakeshore and streams, are susceptible to flooding. *Map 9: FEMA Flood Zones*; *Map 10: Watercourses and Watersheds*, and *Map 11: Regulated State and Federal Wetlands* show the locations of sensitive natural areas. Most of the woodlands in the Town are "second growth" forests that have reverted from farmland. The delineation of those woodlots that have ecological value must be done in the field.

Town-owned Land

The Town of Sodus owns two small parcels of land on Briscoe Cove. The parcels are not currently utilized for public purposes. As they are located within a neighborhood of lakeshore cottages on small lots, it is not clear whether there is potential for developing the parcels for public use.

Agriculture and Farmland

Apples and other fruit orchards are the predominant type of agriculture in the Town of Sodus. The southern Lake Ontario shoreline is well-suited for apples and other fruit crops. Other crops grown in the Town include potatoes, grains and vegetables. *Map 13: Agriculture by Type of Farm* depicts the parcels that are used for agriculture by types of farms. Agriculture is a significant industry in Wayne County as well as in the Town of Sodus. In 2002, the total market value of agricultural products sold in Wayne County was reported as $119,673,000. Most of the farmland in Sodus is devoted to fruit orchards, including apples and cherries. Fruit farming generated more than $40,000,000 in sales in Wayne County in 2002. The 2002 Census of Agriculture provides statistics by zip code, but not by municipality. Zip codes that cover a significant portion of the Town of Sodus are Sodus (14551) and Williamson (14589).

A total of 170 farms were counted in the 2002 Census within the Sodus and Williamson zip codes. Nearly half (81) of these farms generated more than $50,000 in sales, including 34 farms that generated $250,000 or more in sales. For comparison, 30% of all of the farms in Wayne County generated $50,000 or more in sales in 2002. Few of the farms in the Town of Sodus are part-time or “hobby” farms. A total of 75% (129 farms) in the Sodus and Williamson zip codes reported that farming is the primary occupation of the principal farm operator. Of the 170 farms in the Sodus and Williamson zip codes, a total of 109 farms had fruit orchards. A total of 19 farms raised vegetables or melons. *Map 14: Active Agricultural Land* depicts land actively being farmed in the Town of Sodus. *Map 15: Lands in Agricultural Districts* depicts the land currently within Wayne County Agricultural Districts.

Housing and Residential Development

The Town and Village of Sodus have a variety of housing types and residential neighborhoods and a diverse population. This section describes the population of the town, the housing stock and the residential neighborhoods. Statistics from the 2000 Census of Population and Housing, included on the following pages, present an overview of the population and housing characteristics.

Population

In 2000, 1,736 persons resided in the Village of Sodus and 6,054 persons resided in the Town of Sodus outside the Villages of Sodus and Sodus Point. The age distribution of residents in the Town outside the Villages is comparable to that of Wayne County. The proportion of residents aged 65 and older is higher in the Village (16%) than in the Town outside the Villages (12%).

The proportion of residents aged 45-54 is much lower in the Village (10%) than in the Town outside the Villages (15%) or Wayne County (14%). The Village and Town of Sodus are more racially diverse than Wayne County as a whole. In the Village, 16% of the population is Black or African-American, compared to 7% in the Town outside the Villages and 3% in Wayne County.

The population of the Village of Sodus is more transient that that of the Town. The 2000 Census reported that 41% of all Village residents aged five or older lived in a different house in 1995, compared to 31% in the Town outside the Villages and 37% in Wayne County. In both the Village and the Town outside the Villages, nearly three-quarters of the residents who lived in a different house since 1995 moved from elsewhere in Wayne County. Compared to western Wayne County, relatively few people have moved to Sodus from Rochester and other neighboring counties. A total of 33% of all households in the Town outside the Villages, and 18% of households in the Village, are married couples without children under age 18 at home. In the Town, 26% of households are married couples with children under age 18 at home, compared to 29% in the Village. A total of 7% of households in the Town outside the Village and 17% of households in the Village are headed by a single parent. In the Town outside the Villages, 15% of households consist of single persons under age 65. In the Village, 16% of households consist of single persons age 65 or older; this compares to 6% in the Town outside the Village.

The median income of households in the Village ($33,604) is much lower than that of the Town outside the Villages ($41,338). Both are lower than the median for Wayne County ($44,157)

Housing

Of the 2,528 dwelling units reported in the Town of Sodus outside the villages in the 2000 Census, approximately 72% were singlefamily dwellings, 23% were manufactured homes, and 3% were in apartment buildings with three or more units. The 2000 Census reported 775 dwelling units in the Village of Sodus. A total of 58% were single-family dwellings, 22% were in buildings with 3 or more residential units, and 2% were manufactured homes. In the Town of Sodus outside the villages, a total of 1,898 (84%) of the occupied housing units were owner-occupied, and 15% were renter-occupied. The 2000 Census reported 123 seasonal or recreational dwellings, 31 units for migrant workers, and 114 other vacant units.

In the Village of Sodus, a total of 265 units are occupied by renters, representing 38% of the occupied housing units. The 2000 Census reported that 11% of the housing units were vacant. Approximately one-third (34%) of the housing units in the Town of Sodus outside the villages were constructed prior to 1940. Most of the older housing units are located in the hamlets and along Ridge Road. In addition, many historic farmsteads are found in the town. More than half (54%) of the housing units in the Town of Sodus outside the villages were constructed in 1960 or later. Some of these units are in residential subdivisions. However, most of the newer housing has been built along existing roads. *Map 16: New Residential Housing* depicts the location of housing constructed in the Town and Village between 1993 and 2003.

Businesses

There are a limited number of commercial and industrial businesses in the Town of Sodus outside the villages. Most of the commercial, retail and service businesses outside the villages are located in or around the hamlet areas with the Hamlet of Wallington having the largest concentration. A few retail and services businesses are also interspersed along Ridge Road mostly between the Village of Sodus and the Hamlet of Wallington. These businesses are predominantly small, individually-owned neighborhood businesses that serve local residents. Some business development has occurred in limited areas along Route 104. Several commercial, retail and service businesses with direct access onto Route 104 are located along the south side of the highway west of the Route 88 intersection. Commercial development along the north side of this segment of Route 104 is effectively blocked by the railroad right-of-way which is located close to and parallel to the highway.

Commercial development along Route 104 east of the Route 88 intersection has occurred only at intersections due to a long-standing NYS Department of Transportation policy that prohibits the development of driveway access directly onto the highway east of Route 88. The few businesses operating at these locations are accessible by driveways off the intersecting side streets and roads. Very few industrial businesses and properties exist outside the Village of Sodus. There are a couple of industrial properties in the Hamlet of Sodus Center and a couple along Route 14 a short distance south of the Hamlet of Alton. Several active limestone and sand and gravel quarries are also located in the Town in the vicinity of the intersection of South Street and Quarry Road.

Most industrial businesses and industrial properties are located within the Village of Sodus principally in the core of the Village along the railroad right-of-way. Many of the buildings are old, obsolete remnants of a bygone era when manufacturing played a much greater role in the local economy and the businesses relied on the railroad to transport their goods and products. Some of the buildings display signs of neglect and severe deterioration. Such buildings have a blighting affect on the neighborhood. Several appear to be vacant, others appear to be used for storage or for what appear to be small marginal business operations.

A few of the buildings, although old, have been maintained and are in reasonably good condition and house business operations such as a cold storage business, a conveyor belt manufacturer, a water conditioner business, and the headquarters for the Ontario Midland Railroad Company. The former Garlock Sealant Technologies building, a 49,000 sq. ft. building in excellent condition, has been vacant since 2001 when the company closed the site. Trackside Commons on Maple Avenue immediately south of the railroad crossing represent examples of buildings that have been refurbished for continued business uses. Three new light industrial buildings have been constructed in the Village of Sodus along Foley Drive in what resembles an industrial park. The Dynalec Corporation, Pace Electronics and Thermatec Molding have all located operations on Foley Drive. Five undeveloped parcels along the street that are under single ownership are for sale and available for industrial development. Most of the industrial businesses currently operating in Sodus are relatively small and employ between six and 30 employees. Dynalec Corporation with approximately 150 employees and Heluva Good Cheese with approximately 80 employees are the two exceptions.

Transportation and Infrastructure

Watersheds, Flood Plains and Stormwater Drainage

Three watersheds, all discharging ultimately to Lake Ontario, arefound within the Town of Sodus. Tributaries to Sodus Bay drain the eastern quarter of the Town. The western portion of the Town lying north of Ridge Road and extending eastward to Kelly Road drains directly to Lake Ontario through a number of tributaries. The remainder of the town drains to Salmon Creek which discharges directly to Lake Ontario west of the Village of Sodus Point. Watercourses and drainage basins within the Town are shown in *Map 10: Watercourses and Watersheds*. Most flood plains within the Town are found within the Salmon Creek watershed. Many of these are extensive, one half mile or more in width. Many fewer flood plains are found within the Sodus Bay watershed and are generally very confined and in close proximity to the waterways. No flood plains are found within the watershed draining the northwestern portion of the town. Flood plains within the Town of Sodus are depicted on *Map 9: FEMA Flood Zones*.

The drainage systems in the Town outside the Villages are comprised of networks of open ditches, cross-culverts and driveway culverts located within highway and road rights-of-way. Installation, cleaning, maintenance and replacement of these improvements along Town roads is the responsibility of the Town Highway Department. The Wayne County Highway Department and the NYS Department of Transportation are responsible for the maintenance of the drainage improvements along County roads and State Highways. The drainage system within the Village of Sodus is comprised of a network of catch basins, storm sewers and open ditches.

Highways, Roads and Streets

More than 150 miles of public roadways are found within the Town of Sodus outside the Villages. Approximately 22.5 miles consist of NYS Highways which include NYS Routes 104, 88 and 14. Route 104 is a major east-west route through western New York. Route 88 which intersects with Route 104 transects the Village of Sodus and links Sodus to the Village of Newark to the south. Route 14 connects the Village of Sodus Point to the Village of Lyons also to the south. The segment of Route 14 north of Route 104 is designated as part of the Seaway Trail as it approaches Sodus Point. The Seaway Trail is a tourist route along the southern shore of the Saint Lawrence seaway and Lakes Ontario and Erie between Massena, New York and the New York-Pennsylvania border. Multiple County roads, together totaling more than 47 miles in length, are found within the Town of Sodus. Maintenance of these are the responsibility of the Wayne County Highway Department.

Approximately 86.5 miles of public roadway are owned and maintained by the Town. All but 5.5 miles of Town roadways are paved. The Village of Sodus maintains 7.26 miles of Village streets. Roads, and their classifications, are illustrated in *Map 19: Road Classifications*. Village Streets are illustrated on Map 20.

Railroad

A railroad right-of-way follows an east/west course through the Town of Sodus which closely approximates and is frequently adjacent to that of NYS Route 104. The track was purchased by Wayne County and the State of New York and rail service is provided by the short line Ontario Midland Railway. The railway makes use of a siding and engine house located in the Village of Sodus. The railroad right-of-way terminates to the west in the Village of Webster within Monroe County and to the east in the Village of Red Creek. The railroad right-of-way is interconnected to the CSX/Amtrak railroad via a short segment that runs from the Hamlet of Wallington south through Sodus Center to the CSX/Amtrak interchange immediately north of the Village of Newark.

Sidewalks and Trails

Sidewalks are found only within the Villages of Sodus and Sodus Point. Approximately five miles of sidewalks, mostly four feet in width, are maintained within the Village of Sodus. Considerable spot repair of sidewalks is undertaken annually.

Public Transportation

Public Transportation in Wayne County is provided by the Wayne Area Transportation Service (WATS). WATS is a subsidiary of the Genesee-Rochester Regional Transportation Authority (R-GRTA). WATS operates buses along three routes within Wayne County to provide intra-county transportation. The three routes are configured as loops that pass through most of the villages and hamlets within Wayne County although each route differs somewhat from the others. All three bus routes pass through the Town and Village of Sodus. Bus service is provided on weekdays only. No bus service is provided on weekday evenings or on weekends. WATS also operates a Route 104 Connecter Service to the greater Rochester area. The commuter buses travel along Route 88 between the Villages of Sodus and Newark and along Route 104 between the Villages of Sodus and Webster in Monroe County where it connects to Rochester Transit Service (RTS) Route 45. The connector service, designed for working commuters, operates only on weekdays and only in the early morning and late afternoon/early evening hours. WATS bus schedules and bus routes are contained in the appendix.

Williamson-Sodus Airport

The Williamson-Sodus Airport is a small, public-use airport located along Route 104 near the western boundary of the Town of Sodus. The airport contains a 3,800 fool runway which will accommodate twin-engine turboprop aircraft as well as small jet aircraft. The airport has pilot-activated runaway lights and a beacon light which makes it suitable for nighttime use. The airport also has self-service fueling facilities.

Village Water System

The Village of Sodus, which owns and operates its own municipal water system, has two sources of water; Lake Ontario and a well located along Route 88 south of the Village. The Town purchases water from both the Village of Sodus and the Town of Williamson. Average daily demand for the entire Sodus water system is 625,000 gallons, while peak daily demand is approximately 900,000 gallons. The Village's well provides approximately 500,000 gpd. Unfiltered water from the well is disinfected at the wellhead and pumped 24 hours per day directly into the Town's water distribution system through an 8" diameter watermain. Water drawn from Lake Ontario is conveyed to the Village's water filtration plant located outside the Village a short distance north of the Lake Road/Maple Avenue inter section to be filtered and disinfected. The plant, with a capacity to process 1 million gallon per day was constructed in 2002 and is normally operated daily for one shift to supplement the water provided by the well.

Water processed by the plant is pumped directly into the Town's distribution system via two watermains that function as transmission lines to convey water to the Village. One is 10" in diameter, the other 12" in diameter. On average, approximately 125,000 gpd of water is drawn from Lake Ontario, 400,000 gpd during the peak demand season. The Village of Sodus' water distribution system contains two subterranean concrete reservoirs with a combined capacity of 1.25 million gallons. The reservoirs are located on the west side of the Village along Ridge Road atop a steeply sloped hill. The two reservoirs provide for the storage of potable water for both the Village and the Town. The Town has no separate storage facilities of its own. The smaller reservoir was constructed circa 1913, the larger in the mid 1930s as a Works Progress Administration project. Water from the Village's well and water filtration plant is not conveyed directly into the water reservoirs, but enters the reservoirs from the distribution system during times when water production exceeds consumption. The level in the reservoirs is maintained by manually controlling the pumps at its water filtration plant.

<u>Town Water System</u>

The Town of Sodus has five water districts, with several associated extensions, serving 1,100 customers. In addition, a permissive service area surrounds the transmission mains along Maple Avenue. The Town water distribution systems contains approximately 43 miles of watermain, serving approximately 30% of the area within the Town. The water districts and existing water distribution system are shown on *Map 21: Town Water Districts* and *Map 22: Town Water Distribution System*. The Town of Sodus water distribution system has two metered connections with the Williamson water distribution system. One is on Lake Road at the town line, the other on Ridge Road also at the town line. The Ridge Road interconnection is normally closed and serves as an emergency backup supply source only. The Ridge Road interconnection, normally open, supplies the Town of Sodus with approximately 10,000 gpd which is used to serve the northwest quadrant of the Town of Sodus

Water supplied by the Village of Sodus is used to serve the remainder of the Town's water districts and the Village of Sodus Point. A metered connection at the Lake Road/ Maple Avenue intersection supplies the eastern portion of the Lake Road Water District. A metered connection at the Village's well house supplies the water districts in the southern and southeastern portions of the Town. In addition, the Village supplies water to the Town through three metered feeds at the Village line: an 8" diameter feed on State Street to the east, a 10" diameter feed on Old Ridge Road to the east, and a 10" diameter feed on Ridge Road to the west. The Town's distribution system is set up such that an interruption from any of the above three sources can be back-fed from one or both of the other sources.

The Village of Sodus Point furnishes its own water storage tank. The tank was sized to provide a three day reserve to avoid and/or delay a disruption of service to Village customers in the event the supply from the Town were to be disrupted. This is necessary as the Village of Sodus Point has no backup source of water. The Town of Sodus has plans to extend public water in three noncontiguous areas designated as Water District Number 6. Water District No. 6 has been established, but no improvements have yet been constructed.

Sanitary Sewer System

The wastewater collection system within the Village of Sodus is comprised of 10.03 miles of sanitary sewers. Wastewater collected within the northern portions of the Village drains by gravity north to the wastewater treatment plant (WWTP) located on Mud Road north of the Village. Wastewater collected by gravity within southern portions of the Village, which includes the school properties, is first conveyed to pump station located between Mill and Gaylord Streets, and then pumped via a 6" diameter force main to a manhole at the intersection of Orchard Terrace and High Street from where it flows by gravity to the WWTP.

The Village of Sodus WWTP discharges treated effluent to Salmon Creek pursuant to a SPDES permit issued by NYS Department of Environmental Conservation. The plant is authorized to treat 0.383 mgpd. Current average flows are at this level and flows can exceed this level in during rainy periods and in the spring when snowmelt occurs. The WWTP is physically incapable of treating more than 0.5 mgpd.

Although the Village of Sodus WWTP is located in the Town outside the Village, the Town does not own or operate any wastewater collection or treatment systems or improvements. Only two parcels beyond the Village boundary are connected to Village sanitary sewers. Wastewater from the Blossom View Nursing Home on Maple Avenue is pumped via a 4” diameter forcemain/lateral and discharged to the nearby 12” diameter trunk line that conveys sewage from the Village to the WWTP. Wastewater from the former Myers Community Hospital, located a short distance east of the Maple Avenue / Middle Road intersection is also pumped via a 4" force main/lateral and discharged to the trunk line on the grounds of the WWTP.

Parks and Recreation

Myers Memorial Park – This Village park is located on the southwest corner of the intersection of Main and Gaylord Streets adjoining the municipal parking lot. The park, developed in 2000, is a small passive park with park benches, decorative street lights and flower beds. The park is named after Myers Community Hospital. The original hospital stood on the lot.

Lighthouse Park – This Town park is located on Sodus Bay in the Village of Sodus Point. The park contains picnic tables and a historic lighthouse with a museum operated by the Sodus Bay Historical Society. The Historical Society also sponsors “Sundays in the Park” concert programs at the park during the summer months.

Harriman Park – This Town Park is located at the intersection of Route 14 and Margaretta Road and abuts Sodus Bay. The park contains a public boat launch and park benches.

Sodus Point Park - The park, situated across the street from the Sodus Point Village Hall, is owned and maintained by the Town of Sodus. The park is simply an open green space with no improvements.

Sodus Center Park – Located adjacent to Salmon Creek, this Town park is on the corner of the intersection of South and Main Streets in the Hamlet of Sodus Center. The park contains a swing set, picnic shelters and tables and a privy.

Sodus Point Beach – The park, owned and maintained by Wayne County, provides Sodus residents with access to Lake Ontario for wading, swimming and boating**.** In addition to the sand beach, the park contains a bathhouse/lifeguard shelter, concession stand, picnic pavilion, and a cottage that serves as a substation for the Sheriff's marine patrol. The boat launch is open for public use in the spring and fall, but is closed to boaters between Memorial Day and Labor Day due to parking space limitations.

Willow Park – The Village of Sodus Point owns and maintains this park located on Bay Street in Sodus Point. The park contains a playground and a newly constructed skate/skateboard park.

Sodus Recreation – Sodus Recreation is a private, not-for-profit organization in existence since the early 1930s. The program provides a wide spectrum of activities for youth ages 3-14. Activities include arts and crafts, dance and drama, tennis, soccer and track. Sodus Recreation also provides a swim program in which more than 100 children participate annually. Sodus Central School District facilities are used for many of the programs. The public beach on Lake Ontario at Sodus Point is used for the summer swim program. Sodus Recreation also provides other year-round youth and adult recreational programs and activities.

Sodus Little League – The Sodus Little League is a volunteer organization that operates a boys baseball and a girls softball league for youth ages 5-15. Although volunteers organize the league and coach the teams, umpires are paid for their services. Approximately 200 youth participate annually in the program which runs from April through July. Little League baseball games are played on two combination baseball-softball fields and a softball- only field adjacent to the Wallington Fire Hall on Wallington Fire Department property. Little League volunteers developed and maintain the fields and constructed a concession stand on the site. The program relies on business donations and participant registration fees for its operating funds.

Sodus Soccer – Sodus Soccer is a volunteer organization that operates a traveling soccer league for boys and girls ages 11-18. Approximately 120 youth participate annually. Participants must meet Sodus Central School District eligibility requirements. The league is organized and operated by volunteers, but referees are paid. The program begins during the spring school break and ends in the first week of August. Two adult teams were organized for students who have graduated from high school and who will or are playing soccer at the college level.

Office of Aging and Youth (OFAY) is a Wayne County governmental department. Funding provided by New York State for youth programs is administered by OFAY which passes funding through to towns and villages. OFAY provides financial assistance to the: Sodus Youth Venture, (2) Sodus Recreation and (3) Sodus Point Youth Recreation Center. OFAY operates the Sodus Point Beach program. The program includes swimming instruction provided by Red Cross certified swimming instructors. During the summer months, OFAY provides an assortment of senior activities at The Sodus Point lighthouse including craft fairs and music concerts. OFAY also provides congregate meals, Mondays through Fridays, at the Sodus United Third Methodist Church in the Village of Sodus. In addition to the meal, the program includes social, cultural, recreational and educational activities.

Sodus Point Youth Center – The Youth Center is owned and operated by the Village of Sodus Point principally for the benefit and enjoyment of Sodus Point youth, but youth from the Town and Village of Sodus are also welcome to participate. The youth center has a paid staff who provide supervision and who plan and carry out various recreational programs and activities. During the summer months outdoor activities predominate which include sports and games, arts and crafts activities and field trips. During the school year, the youth center operates as a supervised youth drop-in center where youth can go after school or in the evening to play video games, shoot basketballs and/or to socialize with friends.

Beechwood State Park – The park, 175 acres in size, is located along Lake Ontario. New York State purchased the land in 1999 from the Girl Scouts which had used the parcel as a summer camp. The NYS Office of Parks, Recreation and Historic Preservation (OPRHP) is preparing a master plan for the park which is expected to be completed by 2007. The small size of the parcel and its physical attributes will limit the type and scale of facilities that can be incorporated into the park.

Sodus Bay Heights Golf Club – The golf club operates a semi-private golf course located along Route 14 immediately south of the Village of Sodus Point. The facility contains an 18-hole golf course, a pro shop and a restaurant and banquet facility. The golf course is open seasonally April through October. The restaurant, which is also open to the public, operates seasonally from Good Friday through mid November.

Brantling Ski and Snowboard Center – The ski center is a small ski facility primarily serving beginning skiers and is located approximately three miles south of the Village of Sodus on Fishfarm Road. The center is comprised of a six small downhill slopes with a T-bar ski tow. The center also contains a ski lodge with a kitchen and bar, but no overnight lodging accommodations. The ski center also has a ski accessories shop.

The Mill Street Youth Center – The youth center is located on Mill Street in the "old mill", a few doors down from the Municipal Building. Scarlet Thread Ministries operates the youth center which is funded through donations provided by areas churches and individuals. Currently (2005) the center is open on Tuesdays and Thursdays from 2:00 p.m. to 6:00 p.m. and serves youths ages 6 through 12. The center is equipped with a pool table, ping pong table, foosball table and Play Stations with big screen TV. In addition to providing students with a safe and supervised place to drop-in after school to socialize with friends, the center sponsors a “coffee house” with entertainment periodically on Friday nights and a youth worship service on Thursday evenings.

Historic Resources

Sodus derives it’s name from the Cayuga Indian term “Assprodus” which means silvery waters. Sodus Bay, considered to be the best harbor on the southern shore of Lake Ontario, induced Putney Estate to begin to develop the Sodus area in 1794. Pioneers began settling in Sodus Point at that time and by 1811 the Town of Sodus was formerly formed. By 1809, the Village of Sodus was established and the first school erected on Geneva Road north of the Hamlet of Wallington. Sodus had become a bustling center of commerce, one of only five prominent commercial centers in western New York. Sodus Bay served as a shipping port for grain, lumber and, later coal. Although, agriculture served as the mainstay of the economy due to the rich soils and temperate climate provided by its proximity to Lake Ontario. Much of the other local businesses that developed and grew in Sodus served the agrarian economy. During the War of 1812, Sodus, or Troupsville as it was then called, due to its prominence as a commercial center was attacked by the British. The battle, however, was of no major consequence as the British forces were easily repulsed with little loss of life on either side and little damage to the Village.

After the construction of the Erie Canal, the demand for agricultural goods from western New York increased significantly causing a growth in the importance of agricultural particularly fruit orchard production in the Sodus area. Due to the relatively close proximity of the Erie Canal, several efforts were made to obtain financing to construct a canal to link Sodus Bay with the Erie Canal, a distance of only 12 miles. In fact, one effort did secure enough financing to actually enable the promoters to begin the construction of the proposed canal, but it was never completed. By 1871, the idea was abandoned with the advent of the railroad as the rail replaced the Eire Canal as the main conveyance for goods and products. In the late 1800s, there was need for additional routes to Canada for the shipment of coal from Pennsylvania mines. It was at this time the Sodus Bay and Southern Railroad line was constructed between Sodus Bay and the a northern juncture of the Pennsylvania Railroad in the Town of Gorham (Ontario County).

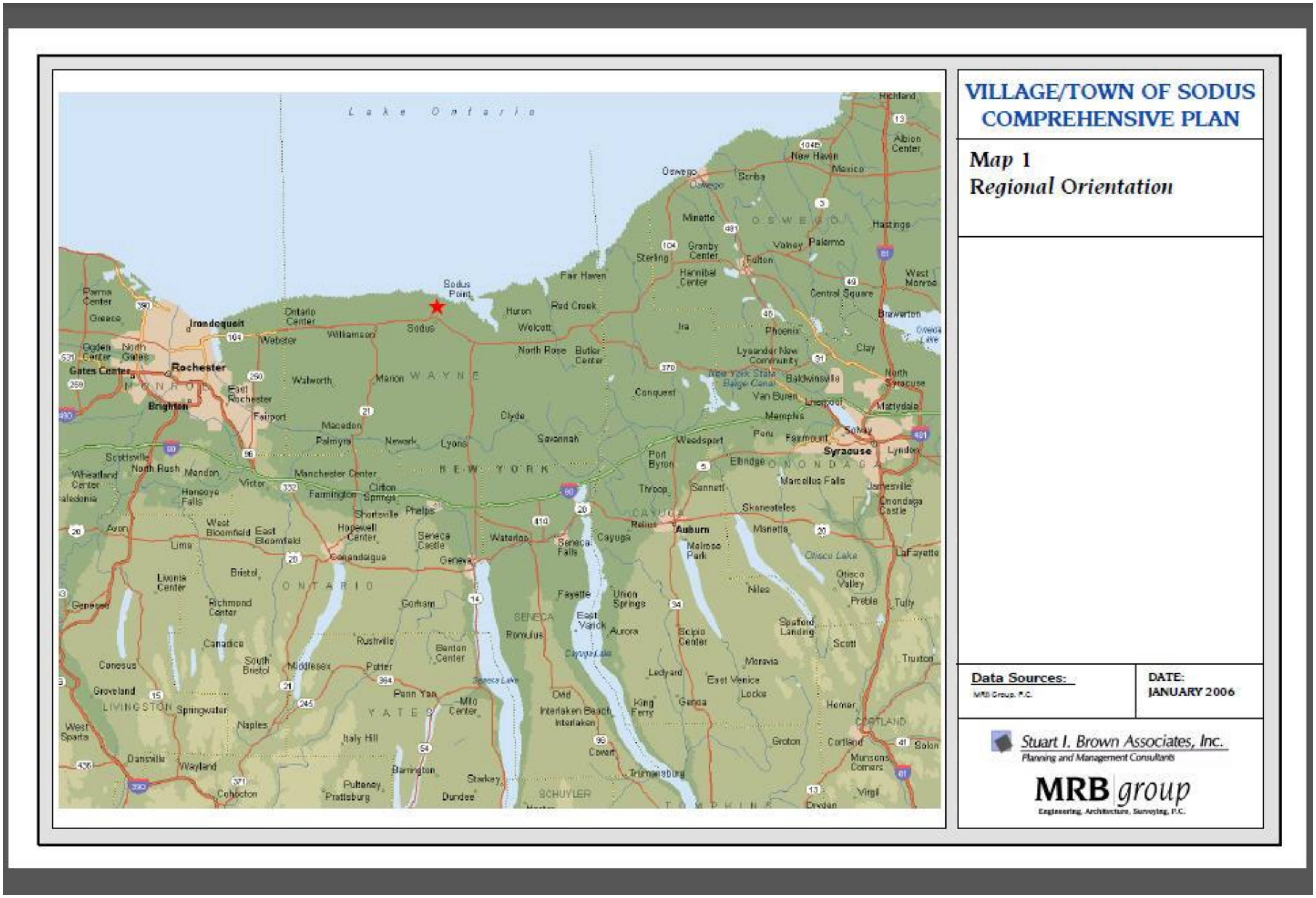
Docks, wharves, a trestle, coal tipples were constructed on Sodus Bay to transfer the coal from railcars to ships. Coal was transported by rail to Sodus Bay for shipment to Canada until 1967. Canadian lumber was also shipped from Canada to Sodus Bay for shipment to points in New York and other states via rail. Although Sodus Bay and the Erie Canal are no longer used for shipping goods and products, agriculture continues to play a key role the local economy as evidenced by the many orchards that blanket much of the rural area in the Town and the prominence of agricultural support businesses in the community. In addition, a variety of other small businesses unrelated to the agrarian economy may be found operated in Sodus today.

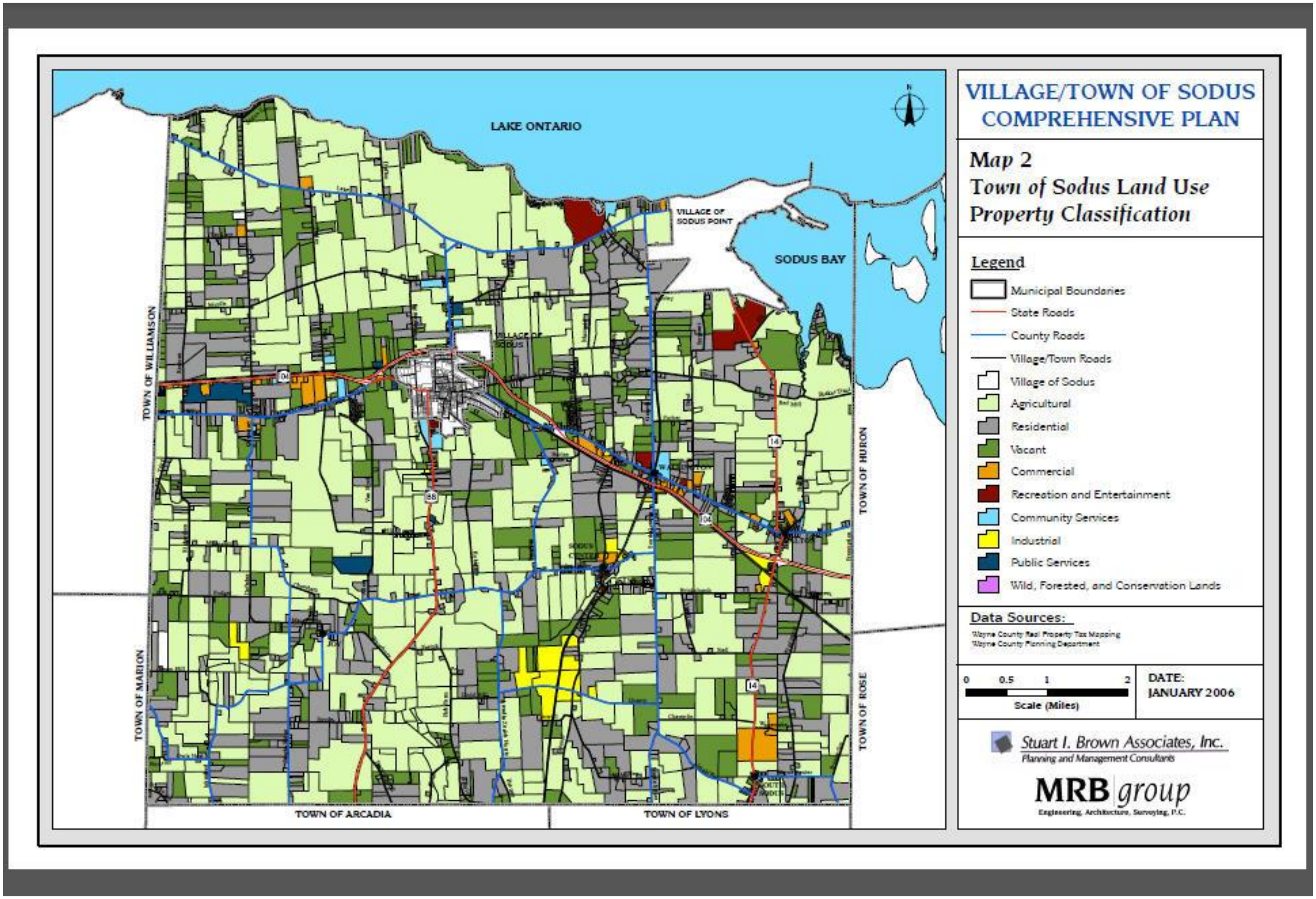
Sodus is also noted for the presence of a Shaker community which was located on the Alasa Farms. The Shakers, or more accurately, the United Society of Believers in Christ’s Second Appearing, is an offshoot of the Religious Society of Friends (Quakers). They were commonly referred to derisively as the Shacking Quakers, due to the manner in which they writhed and trembled during their worship services. The tenets of the sect included celibacy, communal living with no private property, and personal industry. Although the Shakers invented an array of devices including the common clothespin, the flat broom, a revolving oven and a folding stereoscope. Today, the Shakers are probably best remembered for the furniture they manufactured with its with attractive, simple designs. Although not commonly known, the Town of Sodus was also the birthplace of Arbor Day due to the efforts of Edward C. DeLano. Mr. DeLano, who was elected as the Wayne County School Commissioner in 1881, wrote a letter published in the *Wayne County Alliance* newspaper, Mr. DeLano urged the residents of Sodus to donate money and labor to plant trees in every school yard in the township to set an example for other townships in Wayne County and across the State. For the next eight years, Mr. DeLano led the push for the establishment of the observance of an official Arbor Day. In 1889, Mr. Delano, then chief examiner of the State Department of Public Institution supervised the preparation and mailing of the first Arbor Day circular to all the schools across New York State.

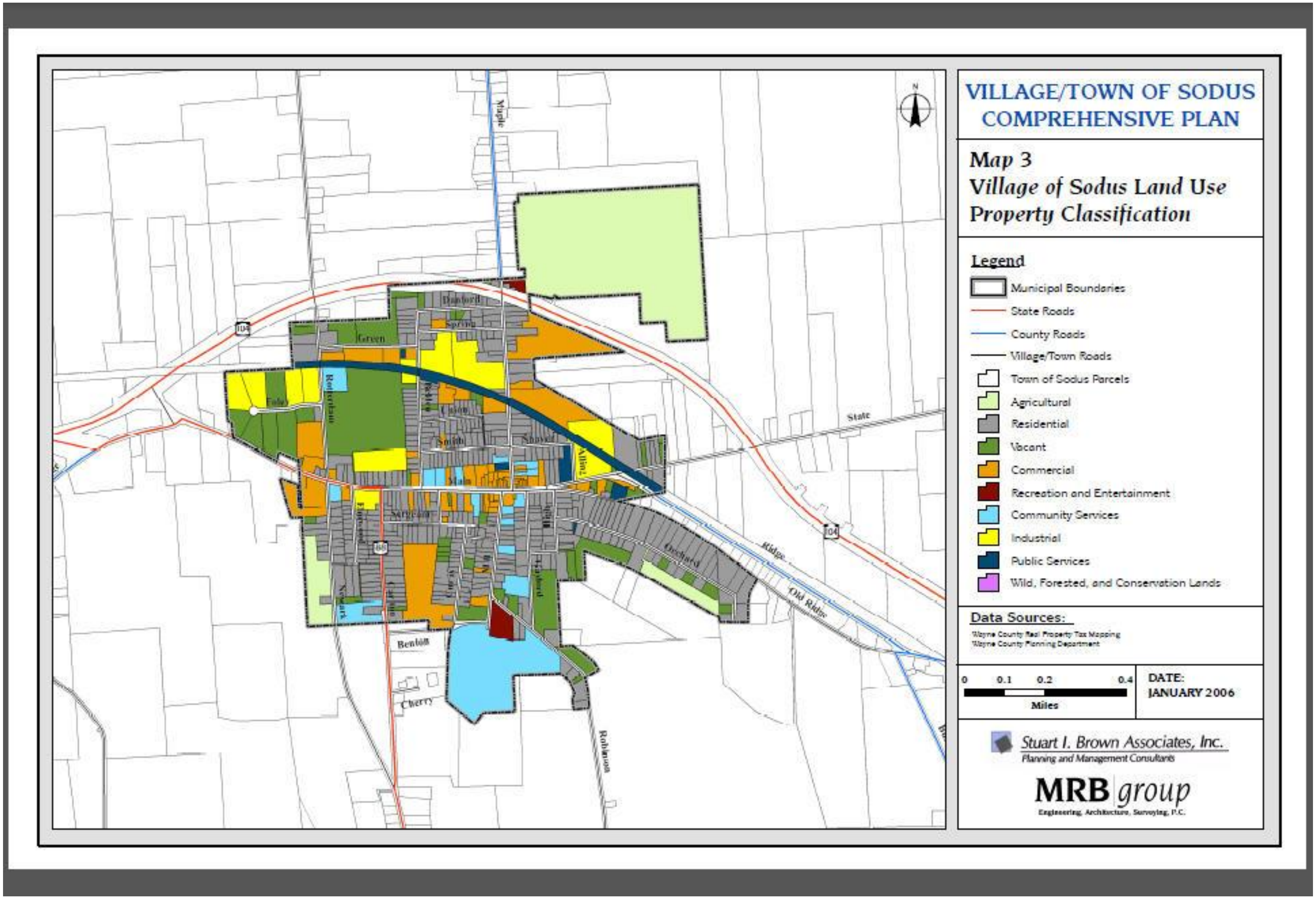
Existing Conditions

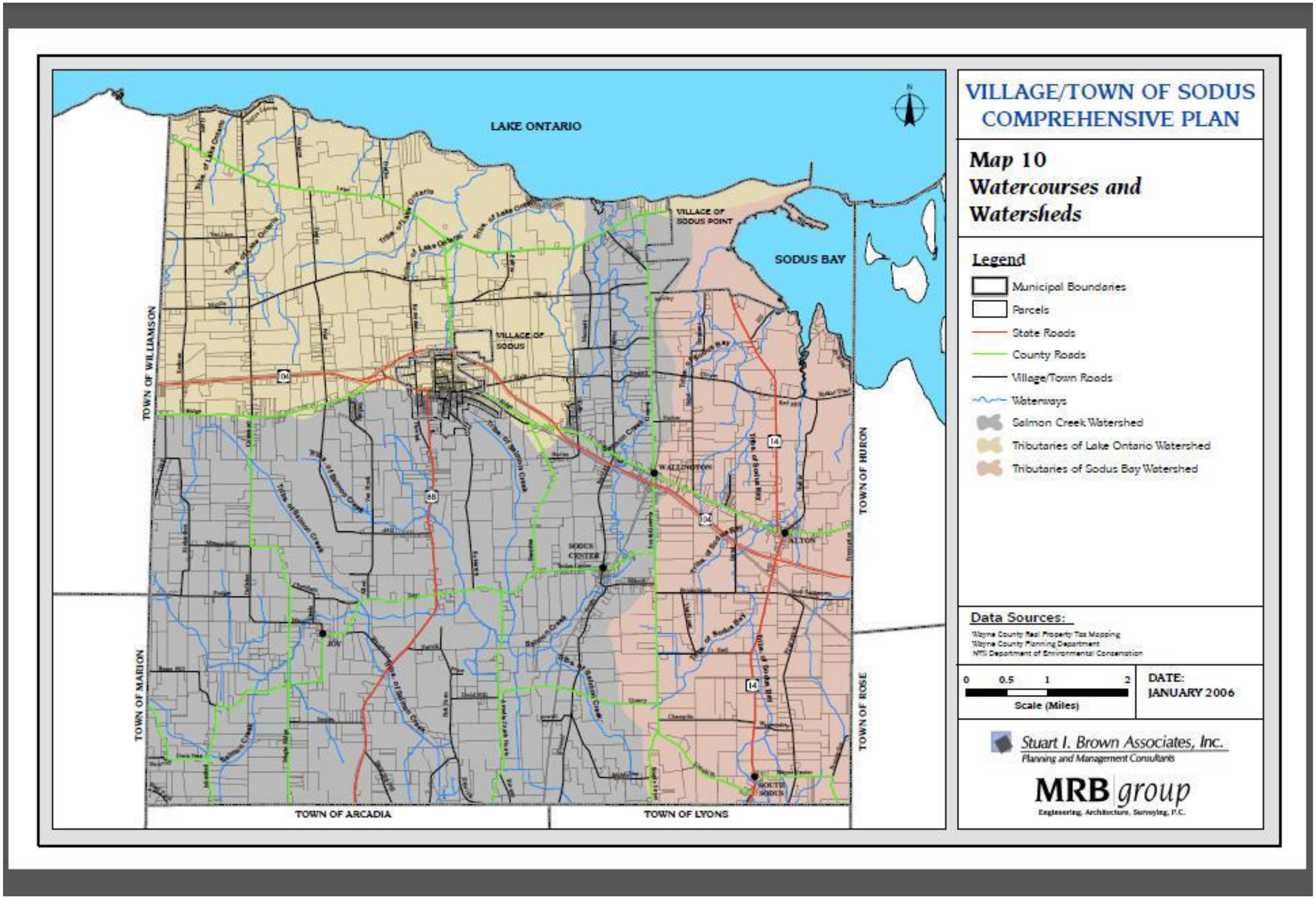
Due to the early prominence of the Town of Sodus as an agricultural and commercial center, many historically significant buildings and sites exist in the township. A plethora of cobblestone homes and structures dot the landscape as depicted in *Map 29: Local Historic Sites*. Among these are the Wallington Cobblestone Schoolhouse and the Wallington Cobblestone Tavern which are listed on the National Register of Historic Places. The others, although they may be eligible, are not listed. The Sodus Center Baptist Church, a brick structure, is also listed on the National Register.

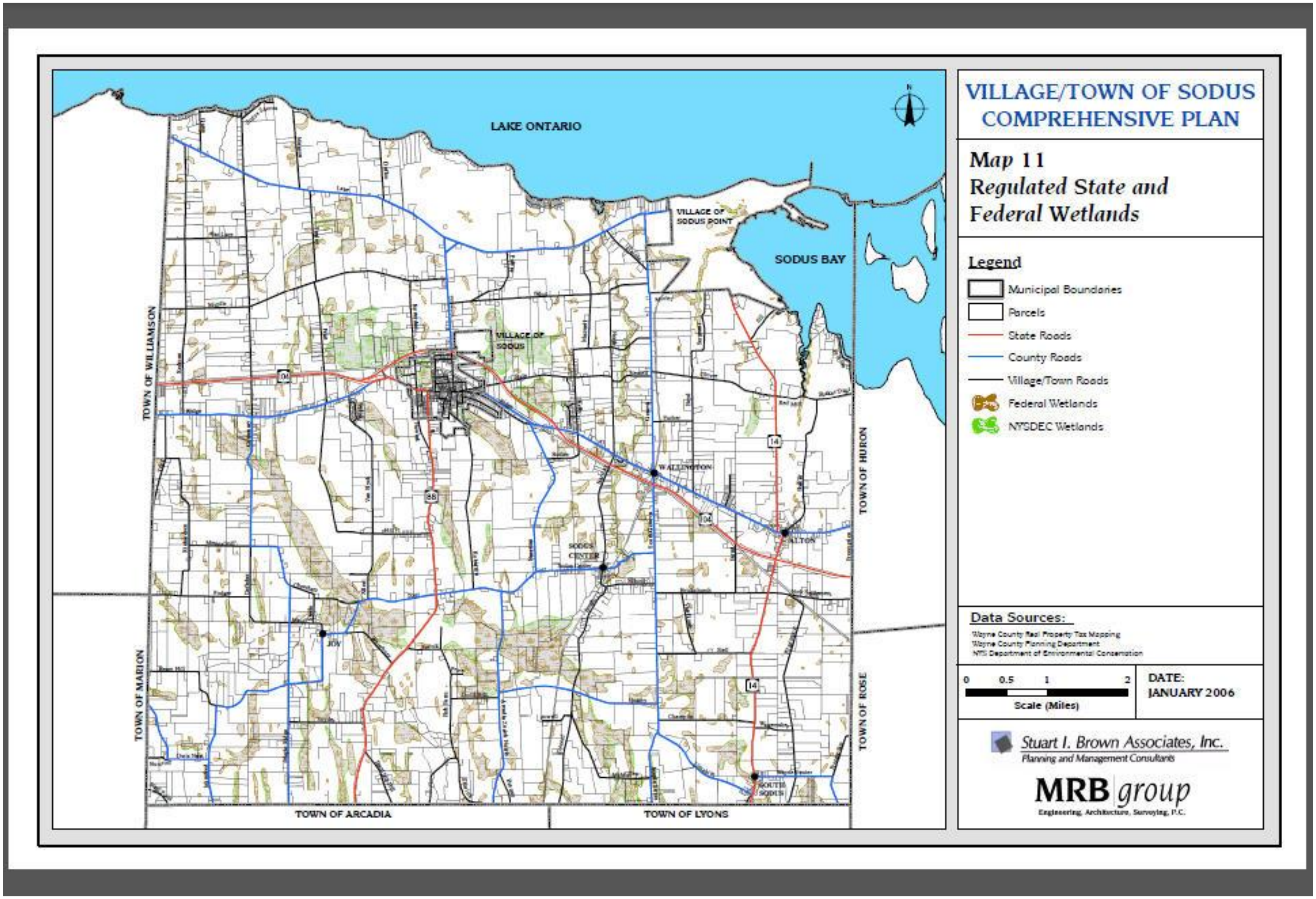
In addition to the many cobblestone structures and the Sodus Center Baptist Church identified above, other historically significant structures stand in Sodus. Among these are St. John's Episcopal Church and the 1812 Hotel. The Alasa Farms, the former home a Shaker community, is among the historically significant properties in Sodus. The locations of these structure are also identified on *Map 29: Local Historic Sites*.

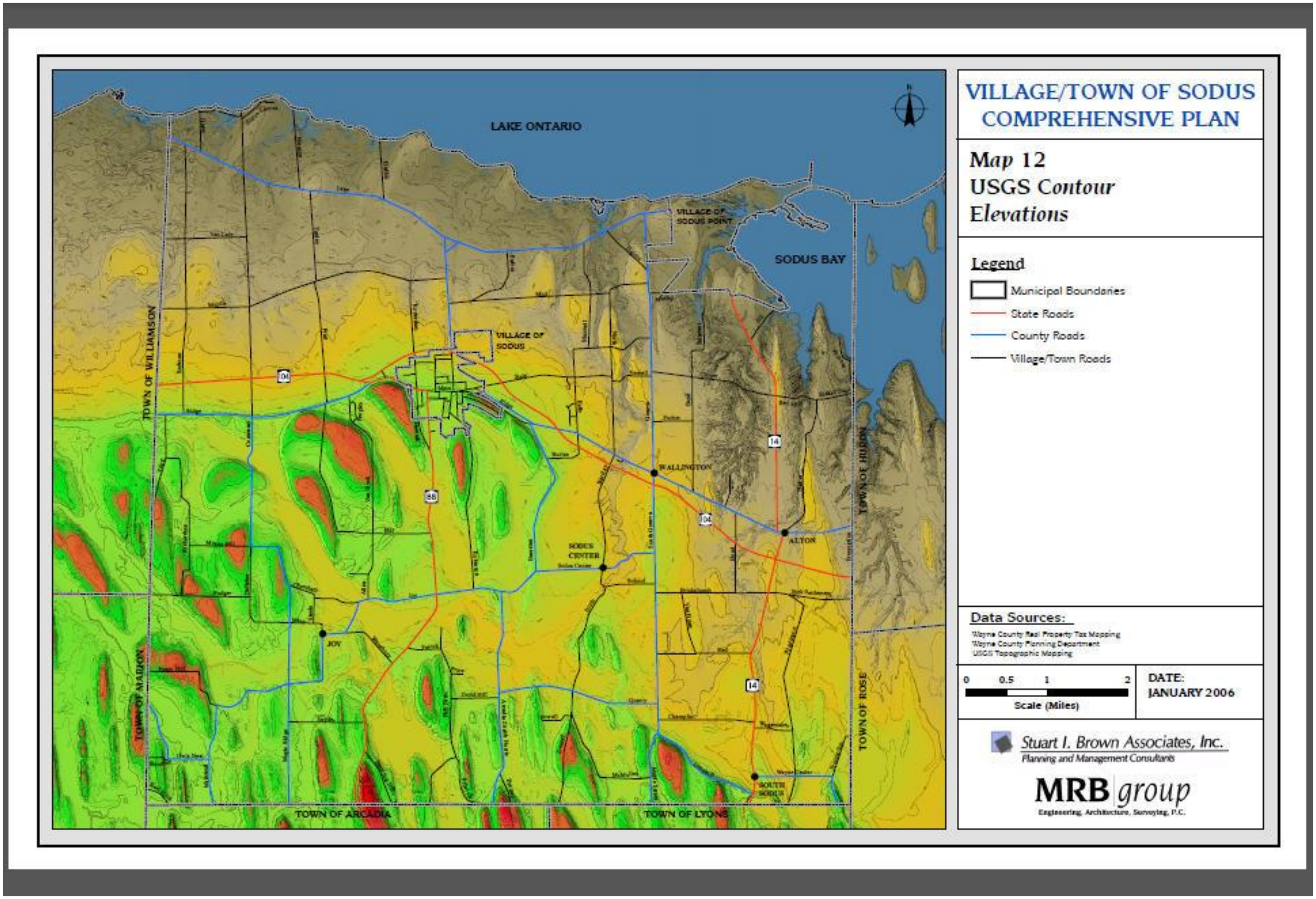

VILLAGE/TOWN OF SODUS COMPREHENSIVE PLAN
Map 1
Regional Orientation
Data Sources:
MRB Group, P.C.
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
Lake Ontario
Sodus Point
Sodus
Rochester
Syracuse
Auburn
Oswego
Geneva
Canandaigua

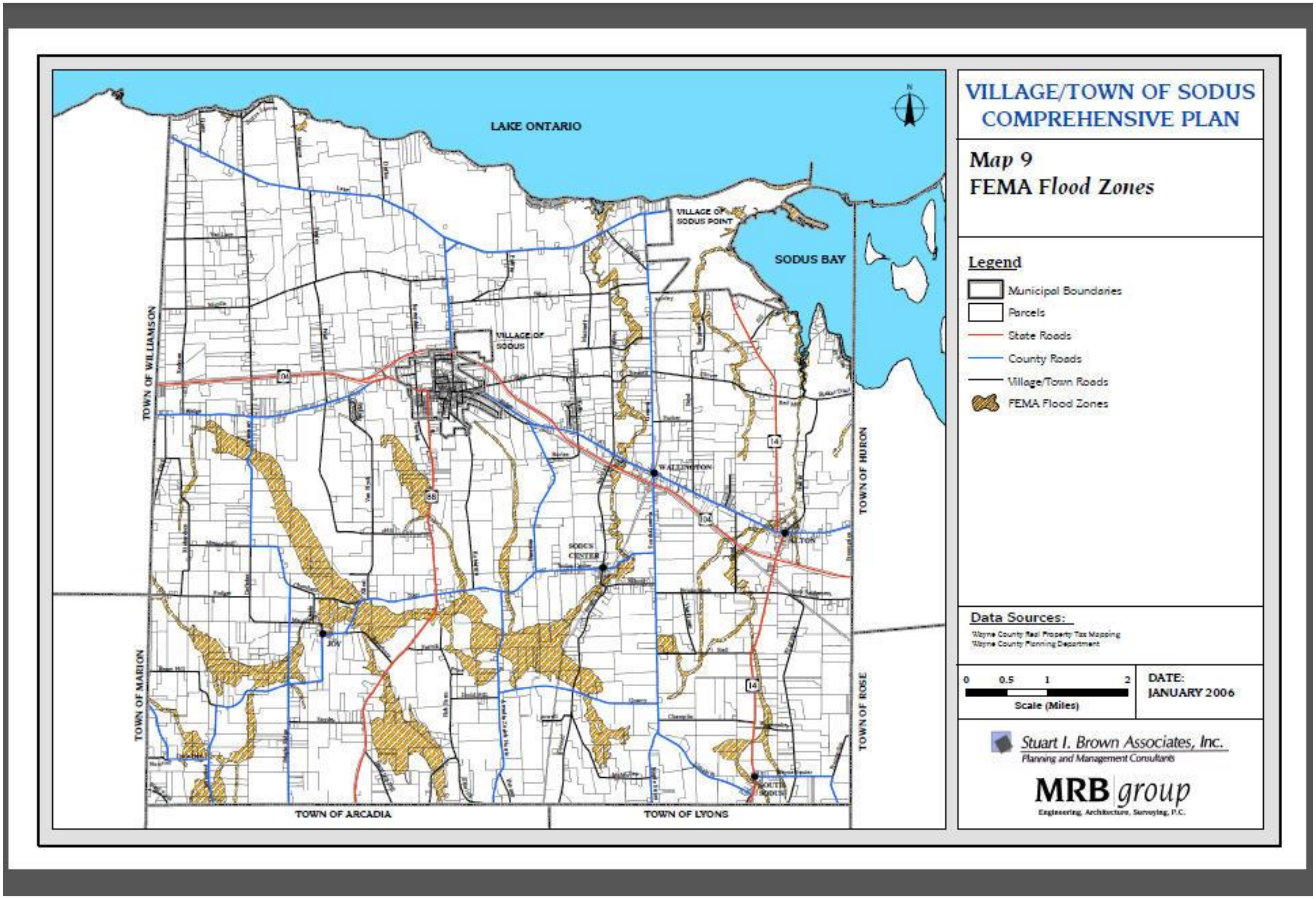

VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 2
Town of Sodus Land Use
Property Classification
Legend
Municipal Boundaries
State Roads
County Roads
Village/Town Roads
Village of Sodus
Agricultural
Residential
Vacant
Commercial
Recreation and Entertainment
Community Services
Industrial
Public Services
Wild, Forested, and Conservation Lands
Data Sources:
Wayne County Real Property Tax Mapping
Wayne County Planning Department
0
0.5
1
2
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
LAKE ONTARIO
VILLAGE OF SODUS POINT
SODUS BAY
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS

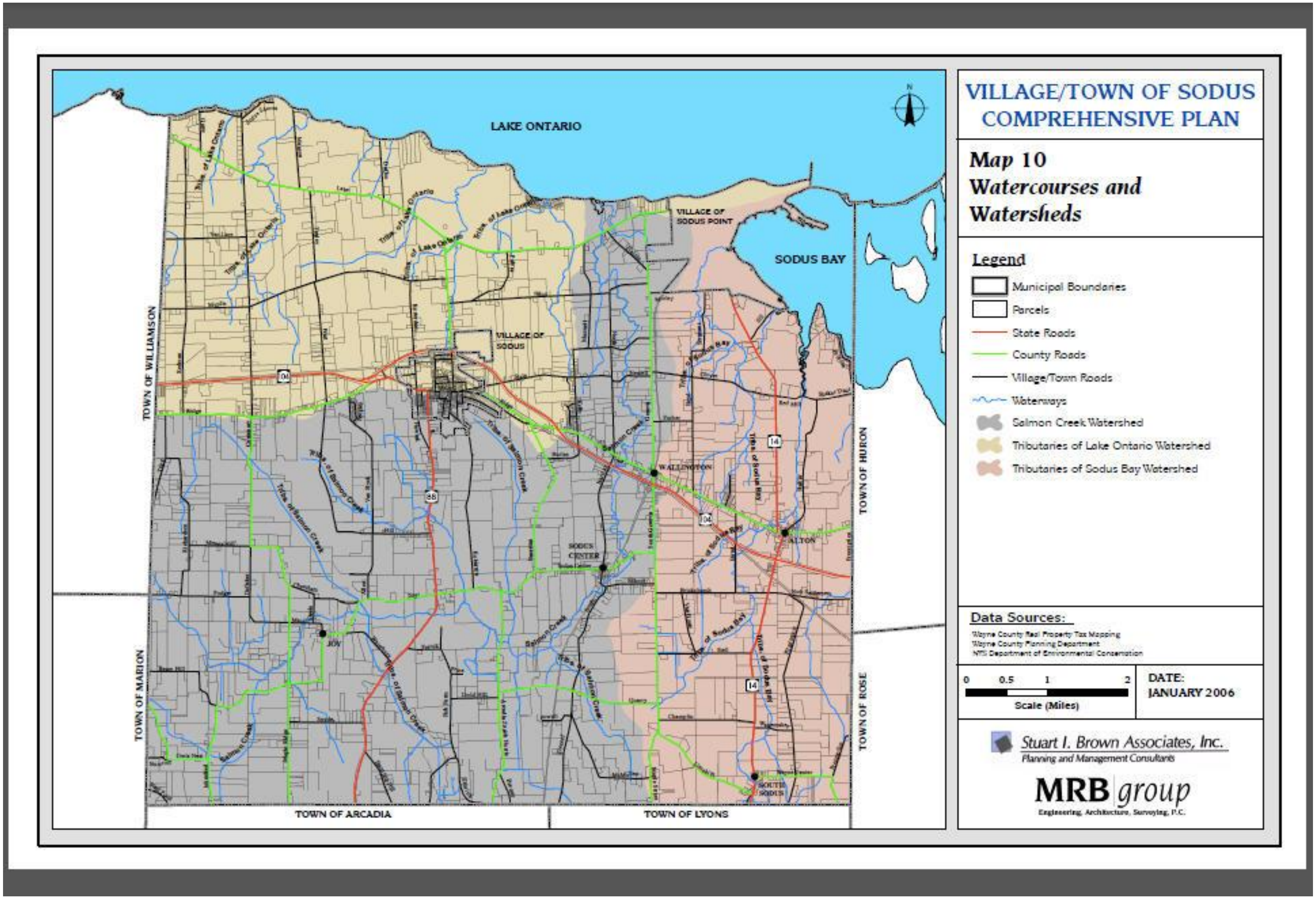

VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 3
Village of Sodus Land Use
Property Classification
Legend
Municipal Boundaries
State Roads
County Roads
Village/Town Roads
Town of Sodus Parcels
Agricultural
Residential
Vacant
Commercial
Recreation and Entertainment
Community Services
Industrial
Public Services
Wild, Forested, and Conservation Lands
Data Sources:
Wayne County Real Property Tax Mapping
Wayne County Planning Department
0 0.1 0.2 0.4
Miles
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.

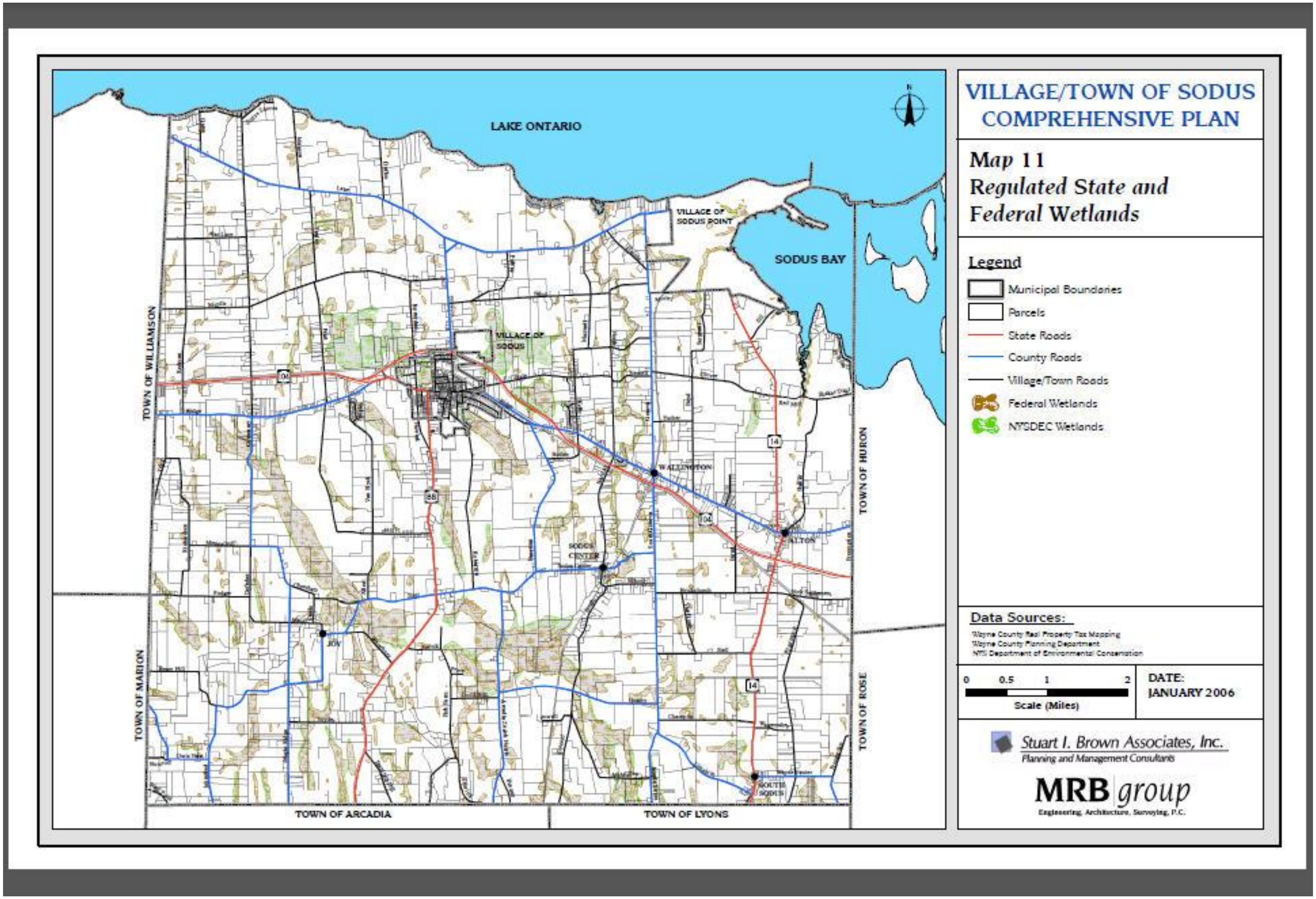

VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 10
Watercourses and Watersheds
Legend
Municipal Boundaries
Parcels
State Roads
County Roads
Village/Town Roads
Waterways
Salmon Creek Watershed
Tributaries of Lake Ontario Watershed
Tributaries of Sodus Bay Watershed
Data Sources:
Wayne County Real Property Tax Mapping
Wayne County Planning Department
NYS Department of Environmental Conservation
0 0.5 1 2
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
WALLINGTON
ALTON
SODUS CENTER
JOY
SOUTH SODUS
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS


VILLAGE/TOWN OF SODUS COMPREHENSIVE PLAN
Map 11
Regulated State and Federal Wetlands
Legend
Municipal Boundaries
Parcels
State Roads
County Roads
Village/Town Roads
Federal Wetlands
NYSDEC Wetlands
Data Sources:
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
WALLINGTON
ALTON
SODUS CENTER
JOY
SOUTH SODUS
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS


VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 12
USGS Contour
Elevations
Legend
Municipal Boundaries
State Roads
County Roads
Village/Town Roads
Data Sources:
Wayne County Real Property Tax Mapping
Wayne County Planning Department
USGS Topographic Mapping
0
0.5
1
2
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
WALLINGTON
ALTON
SODUS CENTER
JOY
SOUTH SODUS
TOWN OF WILLIAMSON
TOWN OF HURON
TOWN OF MARION
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS
104
88
14


VILLAGE/TOWN OF SODUS COMPREHENSIVE PLAN
Map 9
FEMA Flood Zones
Legend
Municipal Boundaries
Parcels
State Roads
County Roads
Village/Town Roads
FEMA Flood Zones
Data Sources:
Wayne County Real Property Tax Mapping
Wayne County Planning Department
0 0.5 1 2
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
WALLINGTON
SODUS CENTER
JOY
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF ARCADIA
TOWN OF LYONS
TOWN OF ROSE
TOWN OF HURON


VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 10
Watercourses and Watersheds
Legend
Municipal Boundaries
Parcels
State Roads
County Roads
Village/Town Roads
Waterways
Salmon Creek Watershed
Tributaries of Lake Ontario Watershed
Tributaries of Sodus Bay Watershed
Data Sources:
Wayne County Real Property Tax Mapping
Wayne County Planning Department
NYS Department of Environmental Conservation
0 0.5 1 2
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
WALLINGTON
ALTON
SODUS CENTER
JOY
SOUTH SODUS
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS


VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 11
Regulated State and
Federal Wetlands
Legend
Municipal Boundaries
Parcels
State Roads
County Roads
Village/Town Roads
Federal Wetlands
NYSDEC Wetlands
Data Sources:
DATE:
JANUARY 2006
Scale (Miles)
0
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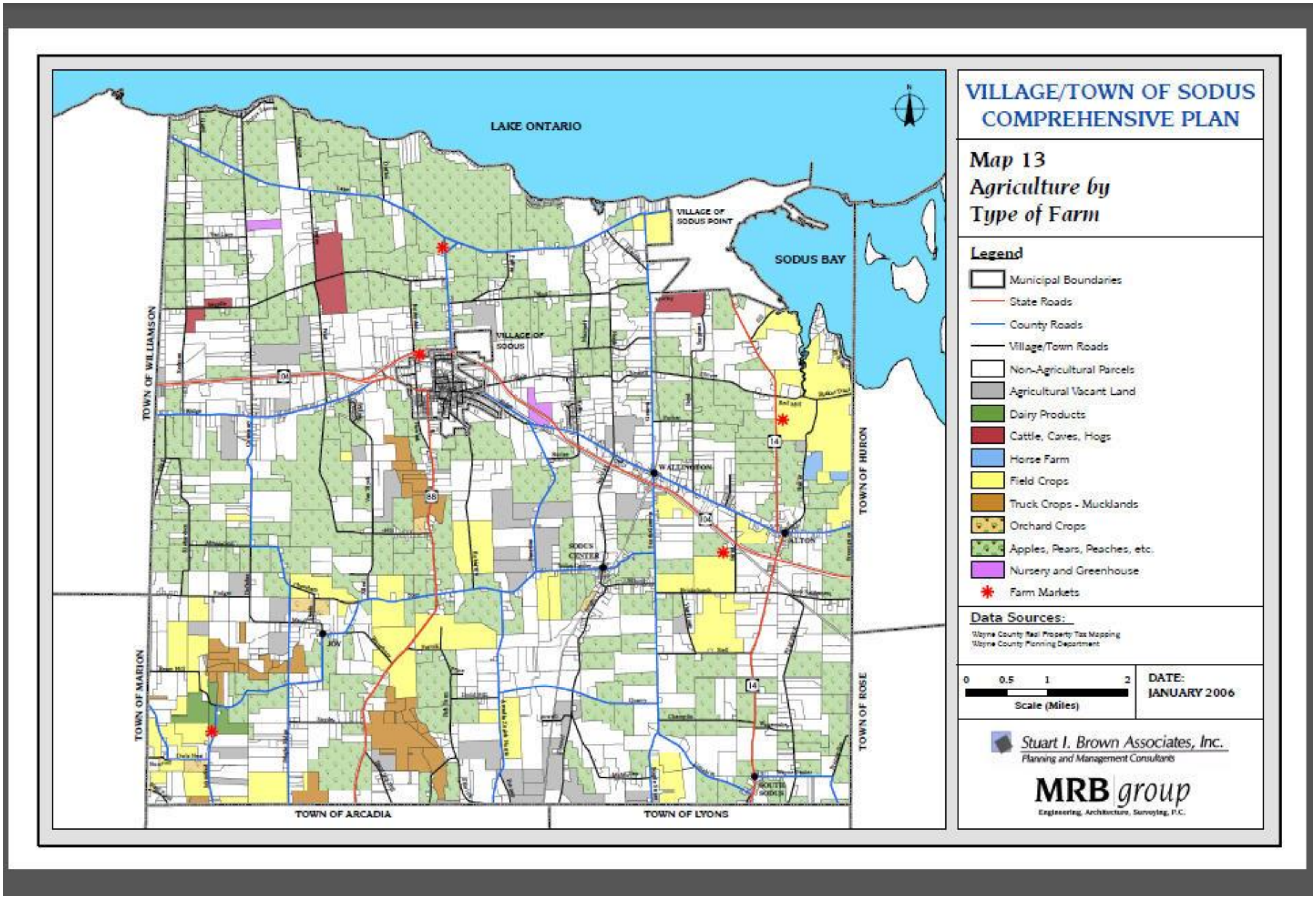
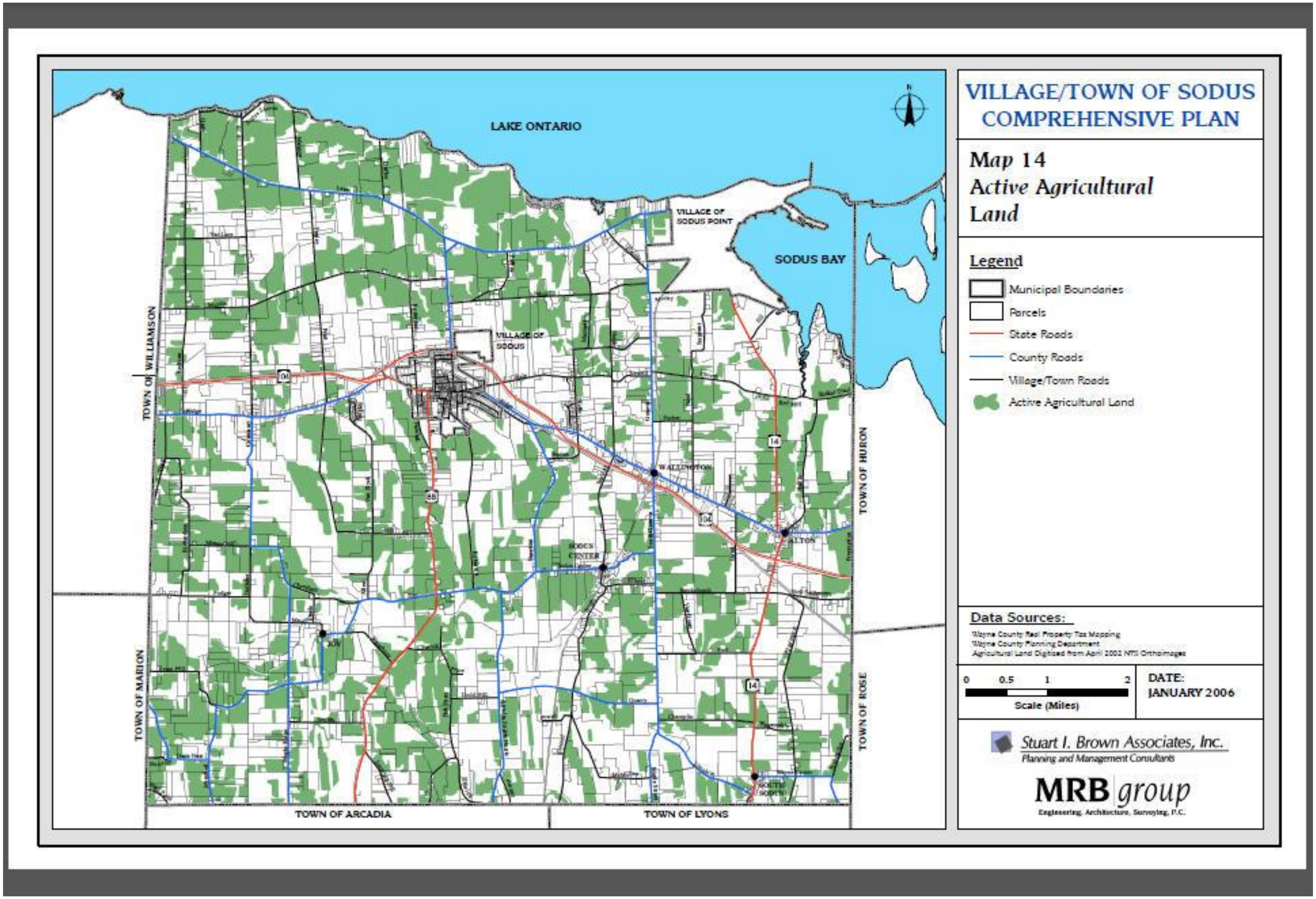
1
2
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
WALLINGTON
SODUS CENTER
JOY
ALTON
SOUTH SODUS
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS


VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 13
Agriculture by
Type of Farm
Legend
Municipal Boundaries
State Roads
County Roads
Village/Town Roads
Non-Agricultural Parcels
Agricultural Vacant Land
Dairy Products
Cattle, Calves, Hogs
Horse Farm
Field Crops
Truck Crops - Mucklands
Orchard Crops
Apples, Pears, Peaches, etc.
Nursery and Greenhouse
Farm Markets
Data Sources:
Wayne County Real Property Tax Mapping
Wayne County Planning Department
0 0.5 1 2
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
LAKE ONTARIO
VILLAGE OF SODUS POINT
SODUS BAY
VILLAGE OF SODUS
WALLINGTON
ALTON
SODUS CENTER
JOY
SOUTH SODUS
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS


VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 14
Active Agricultural Land
Legend
Municipal Boundaries
Parcels
State Roads
County Roads
Village/Town Roads
Active Agricultural Land
LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
WALLINGTON
ALTON
SODUS CENTER
SOUTH SODUS
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS
Data Sources:
0 0.5 1 2
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
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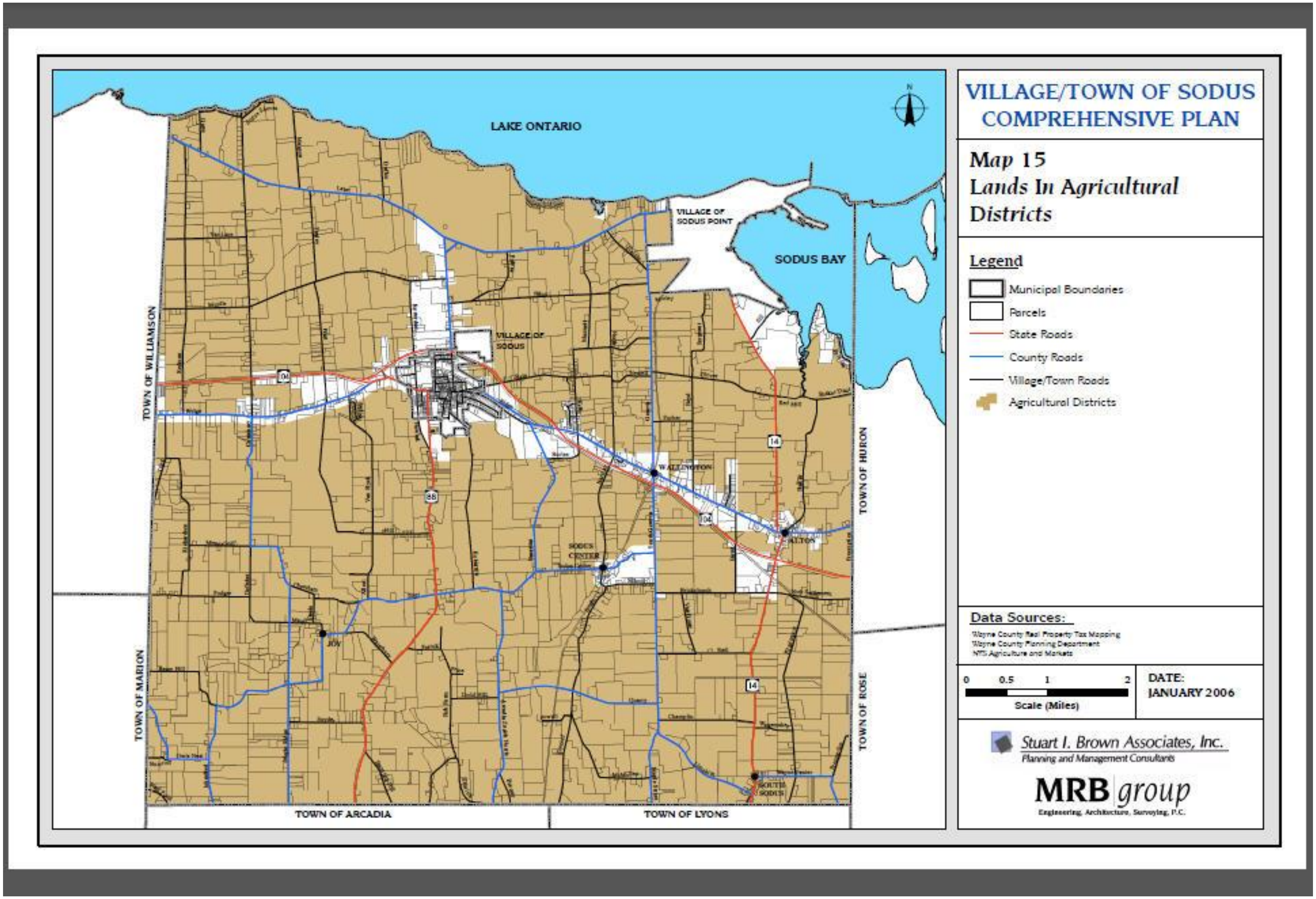
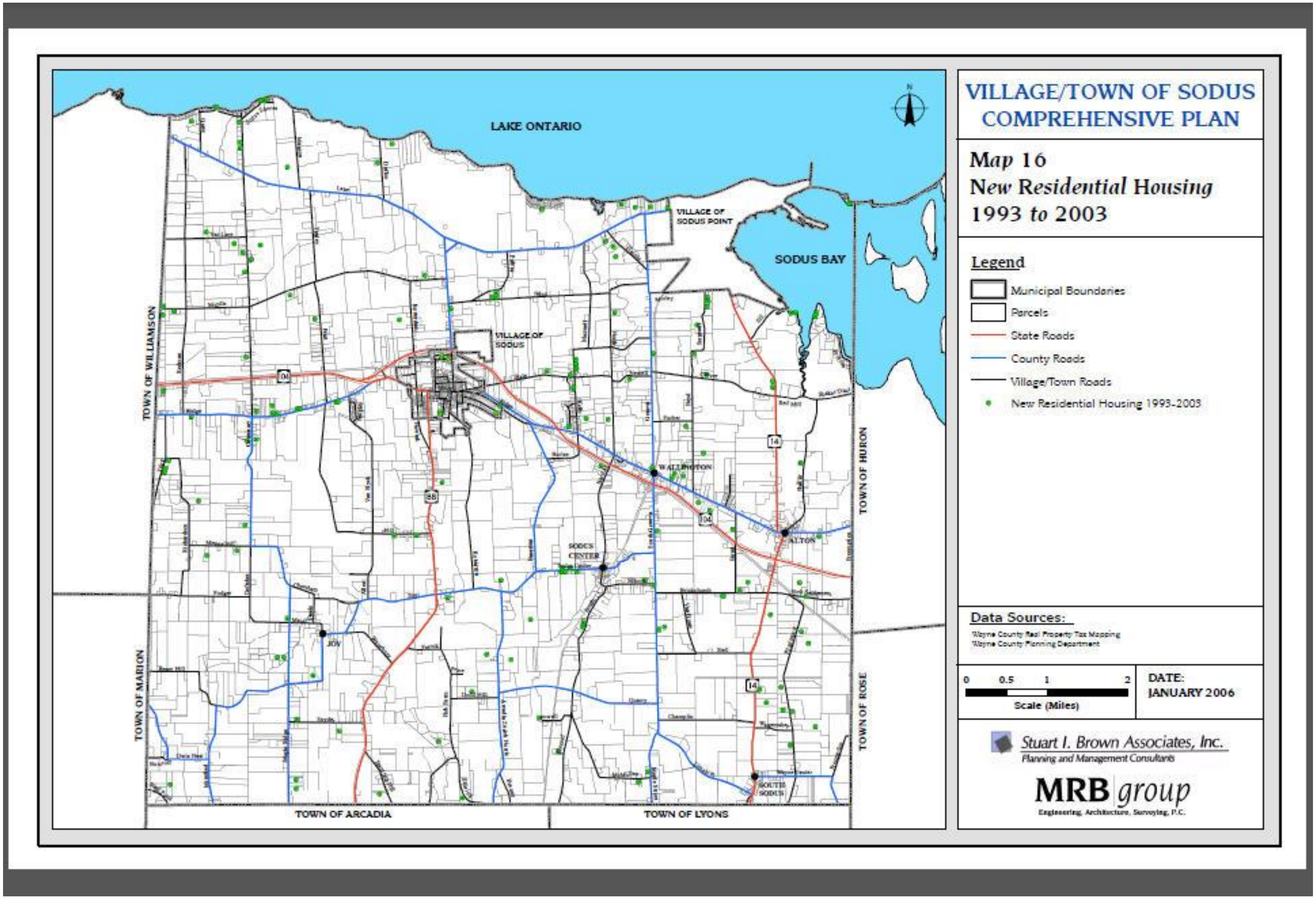
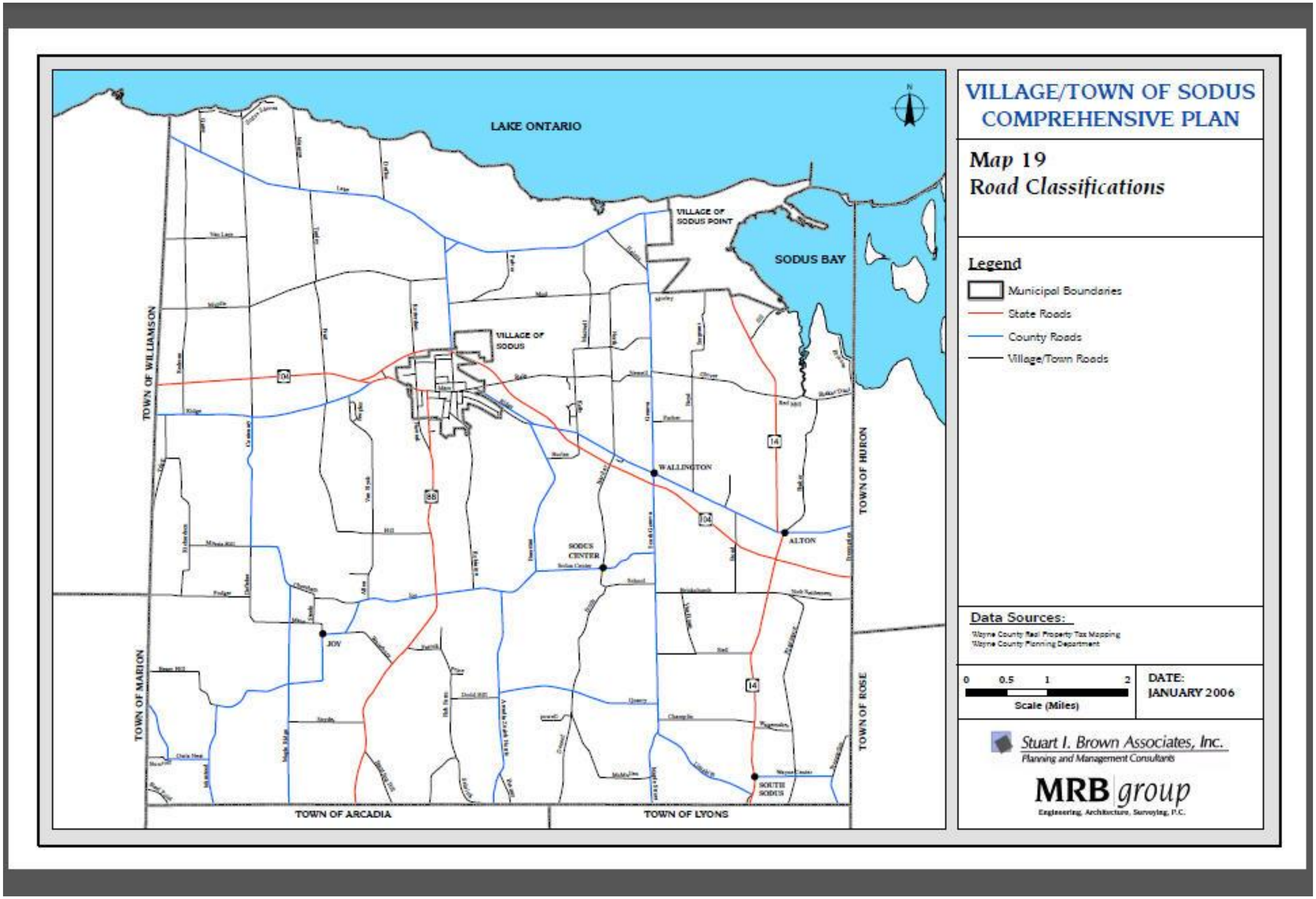
Engineering, Architecture, Surveying, P.C.


VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 15
Lands In Agricultural Districts
Legend
Municipal Boundaries
Parcels
State Roads
County Roads
Village/Town Roads
Agricultural Districts
Data Sources:
DATE:
JANUARY 2006
Scale (Miles)
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS


VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 16
New Residential Housing
1993 to 2003
Legend
Municipal Boundaries
Parcels
State Roads
County Roads
Village/Town Roads
New Residential Housing 1993-2003
Data Sources:
Wayne County Real Property Tax Mapping
Wayne County Planning Department
0 0.5 1 2
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
WALLINGTON
ALTON
SODUS CENTER
JOY
SOUTH SODUS
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS


VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 19
Road Classifications
Legend
Municipal Boundaries
State Roads
County Roads
Village/Town Roads
Data Sources:
Wayne County Real Property Tax Mapping
Wayne County Planning Department
0
0.5
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2
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
WALLINGTON
ALTON
SODUS CENTER
JOY
SOUTH SODUS
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS
104
88
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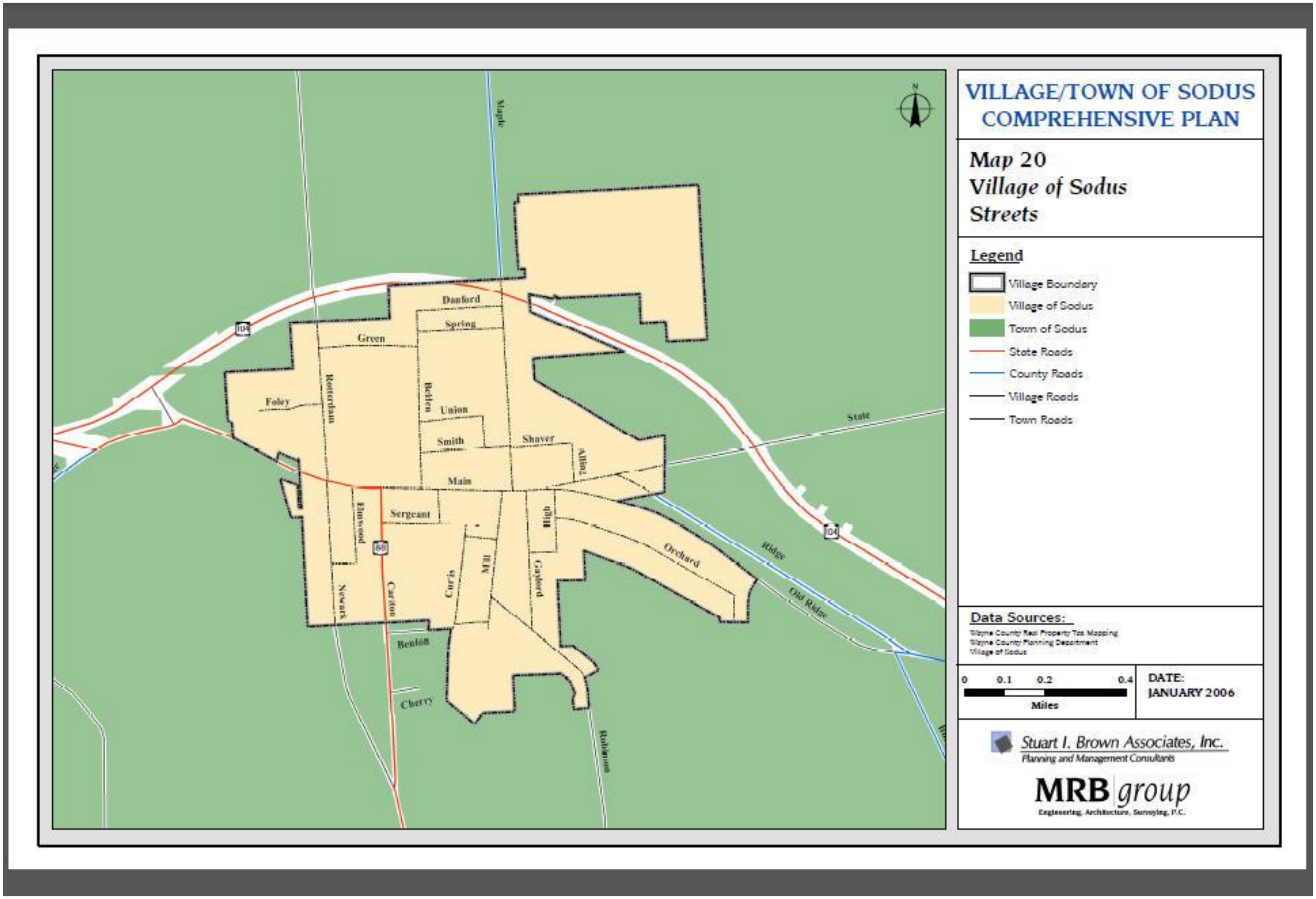
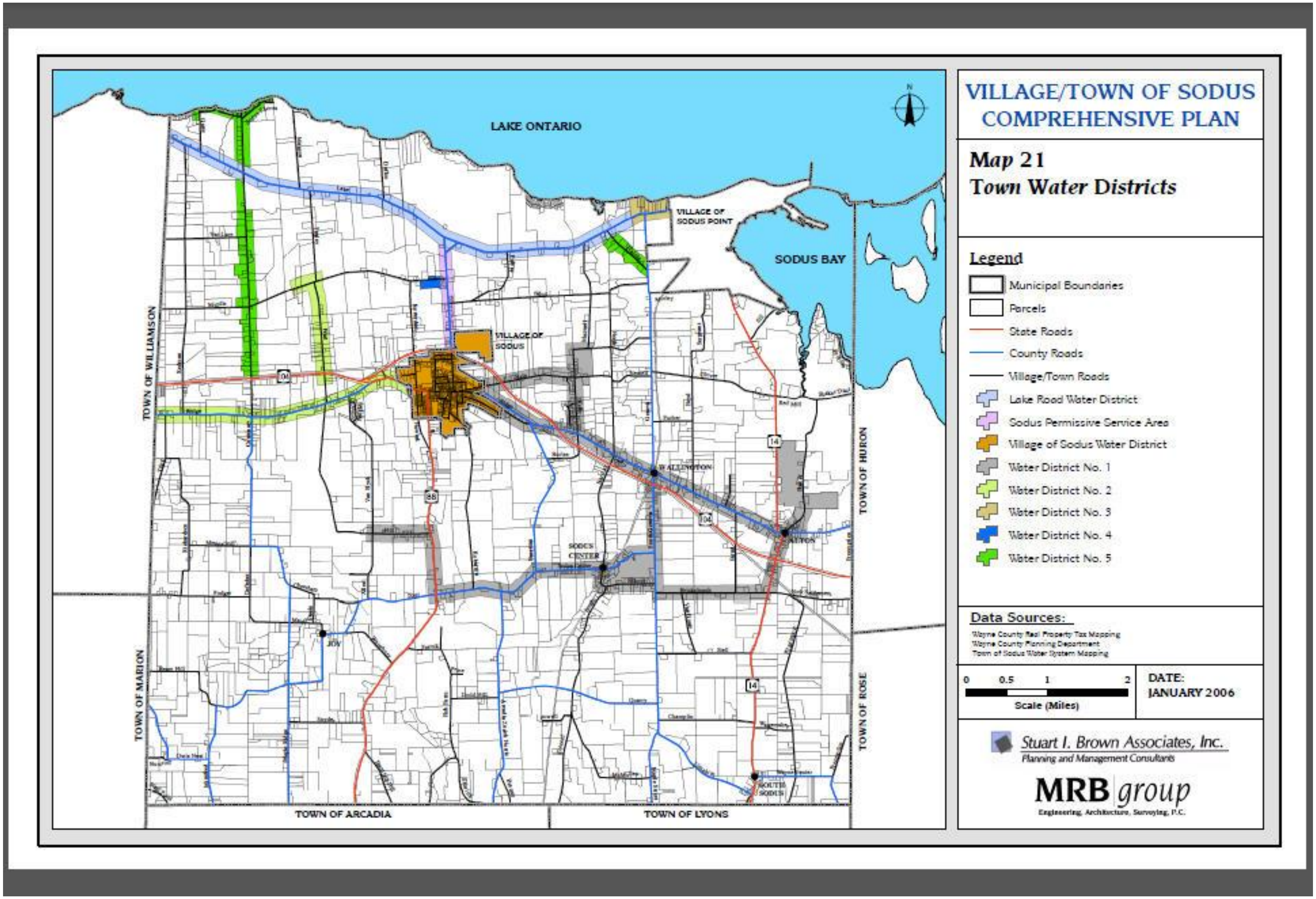
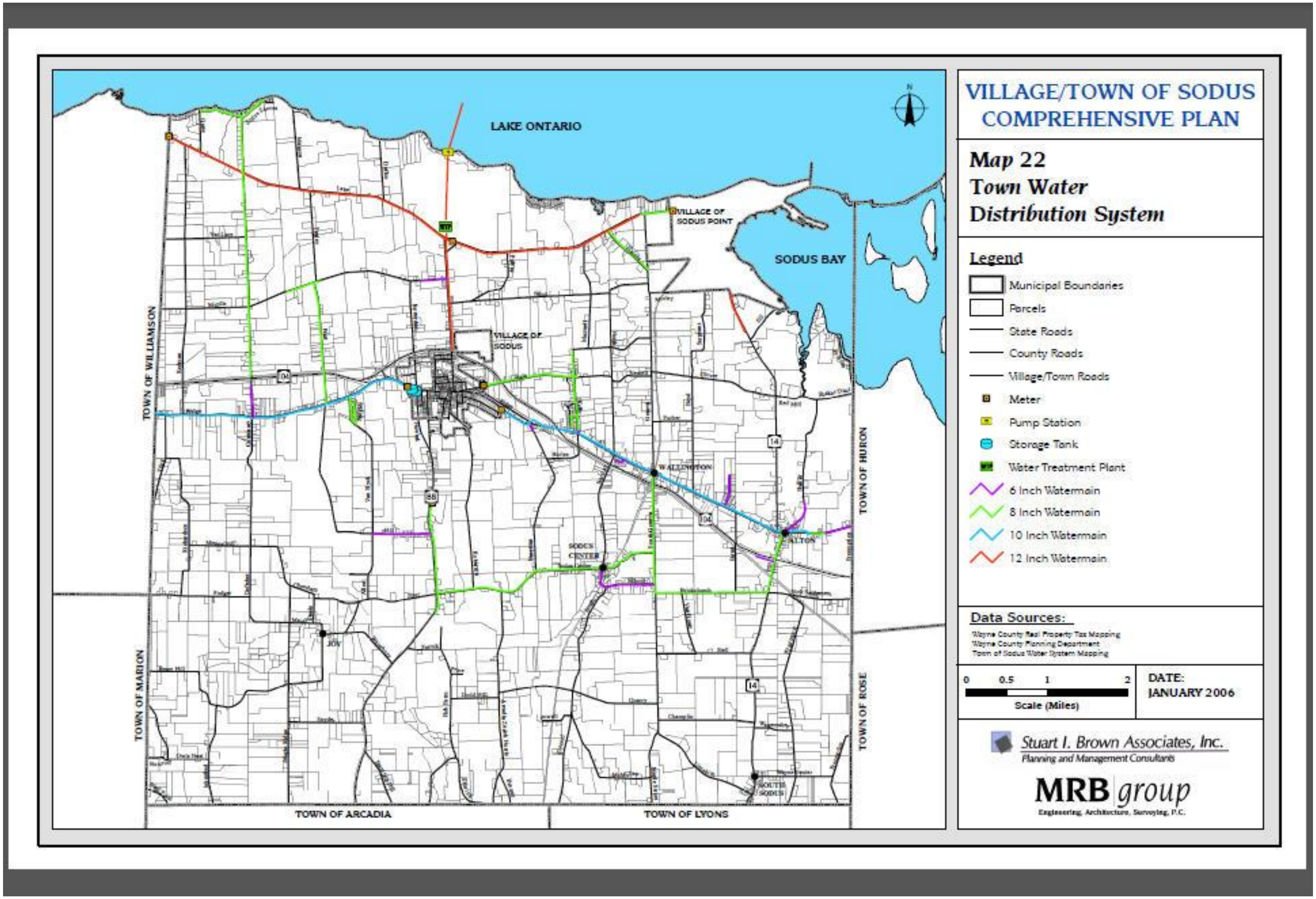
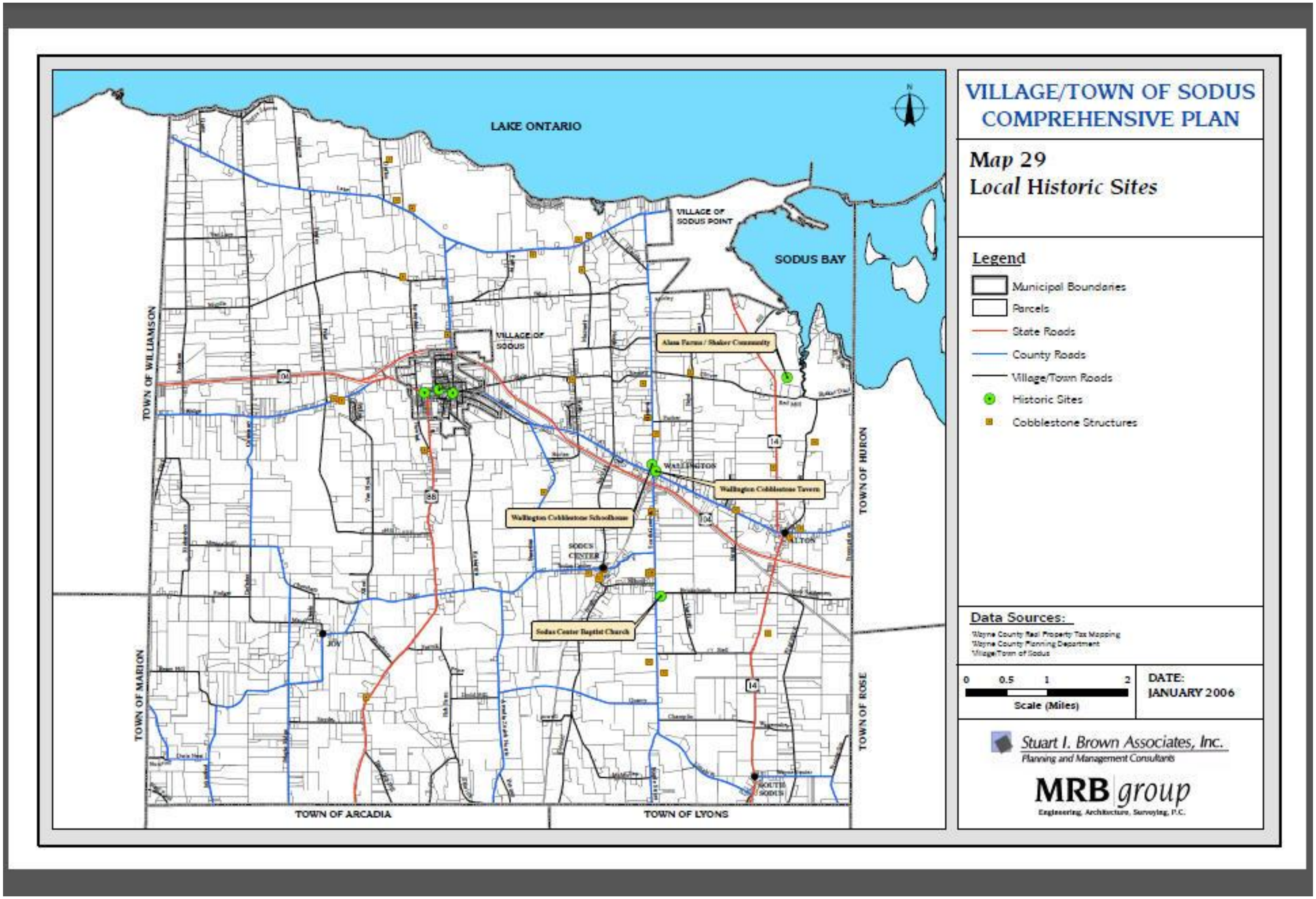

VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 20
Village of Sodus
Streets
Legend
Village Boundary
Village of Sodus
Town of Sodus
State Roads
County Roads
Village Roads
Town Roads
Data Sources:
DATE:
JANUARY 2006
0 0.1 0.2 0.4
Miles
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
Danford
Spring
Green
Foley
Rotterdam
Bellen
Union
Smith
Shaver
Main
Sergeant
Elmwood
Orchard
Gaylord
Newark
Carlton
Curtis
Benton
Cherry
Maple
State
Ridge
Old Ridge
Robinson
104
88


VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 21
Town Water Districts
Legend
Municipal Boundaries
Parcels
State Roads
County Roads
Village/Town Roads
Lake Road Water District
Sodus Permissive Service Area
Village of Sodus Water District
Water District No. 1
Water District No. 2
Water District No. 3
Water District No. 4
Water District No. 5
Data Sources:
Wayne County Real Property Tax Mapping
Wayne County Planning Department
Town of Sodus Water System Mapping
0 0.5 1 2
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
WALLINGTON
ALTON
SODUS CENTER
JOY
SOUTH SODUS
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS


LAKE ONTARIO
SODUS BAY
VILLAGE OF SODUS POINT
VILLAGE OF SODUS
WALLINGTON
ALTON
SODUS CENTER
JOY
SOUTH SODUS
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS
VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 22
Town Water
Distribution System
Legend
Municipal Boundaries
Parcels
State Roads
County Roads
Village/Town Roads
Meter
Pump Station
Storage Tank
Water Treatment Plant
6 Inch Watermain
8 Inch Watermain
10 Inch Watermain
12 Inch Watermain
Data Sources:
Wayne County Real Property Tax Mapping
Wayne County Planning Department
Town of Sodus Water System Mapping
0 0.5 1 2
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.


VILLAGE/TOWN OF SODUS
COMPREHENSIVE PLAN
Map 29
Local Historic Sites
Legend
Municipal Boundaries
Parcels
State Roads
County Roads
Village/Town Roads
Historic Sites
Cobblestone Structures
Data Sources:
Scale (Miles)
DATE:
JANUARY 2006
Stuart I. Brown Associates, Inc.
Planning and Management Consultants
MRB group
Engineering, Architecture, Surveying, P.C.
LAKE ONTARIO
VILLAGE OF SODUS POINT
SODUS BAY
VILLAGE OF SODUS
Alasa Farms / Shaker Community
Wallington Cobblestone Tavern
Wallington Cobblestone Schoolhouse
Sodus Center Baptist Church
SODUS CENTER
TOWN OF WILLIAMSON
TOWN OF MARION
TOWN OF HURON
TOWN OF ROSE
TOWN OF ARCADIA
TOWN OF LYONS