Appendix XI: 2014 Town of Victor Natural Resource Inventory Assessment









TOWN OF VICTOR NEW YORK

Natural Resource Inventory & Assessment

2014







NATURAL RESOURCE INVENTORY & ASSESSMENT

TOWN OF VICTOR, NEW YORK

APRIL 2014

Natural resources consist of living things and naturally occurring materials in the environment. Natural resources include but are not limited to air, minerals, soils, sources of energy, water, fish, wildlife, and forests.

A Natural Resource Inventory (NRI) is a document that catalogues the physical and biological characteristics of an area, collects the data in a usable format, and interprets the findings. This is a living document, meaning information is changed or added as new scientific study results become available. The NRI represents what exists now, although at times it revisits the past in order to provide a better understanding of the present.

An NRI can serve as a planning and project review tool for municipalities at the local level, as well as a tool for county or regional planning and project assessment. A better understanding of natural resources enables communities to conserve its natural resources for current and future generations. The NRI is also intended to help guide a municipality in steps that it can take to balance development with environmental protection.

New York State Environmental Conservation Law (ECL) Article 47 on County and Regional Environmental Management Councils mandates an accurate inventory of natural resources of the county. Article 12-F Section 239-x of the State of New York General Municipal Law states that local legislatures may create a conservation advisory council (CAC) to advise in the development, management and protection of its natural resources:

http://www.nysaccny.org/index.php?s=Article+12-F+Section+239-x+of+the+State+of+New+York+General+Municipal+Law

The Town of Victor maintains a Conservation Board to fulfill this need.

The legislation directs CACs to create an **open areas inventory** and **map. The guide also encourages CACs to develop a natural resource inventory (NRI) as the basis for an open areas inventory** (i.e., the NRI will offer technical evidence for the protection or acquisition priorities in the open areas inventory) and to include the following basic components: physical geography, geology, soils, surface and groundwater, land-use, vegetation, and wildlife.

This document, organized into three volumes, is an updated and expanded version of the 2009 version of the Natural Resource Inventory for the Town of Victor. This work is published on the Town of Victor website **http://www.victorny.org/index.aspx?nid=145**.

OF NOTE:

The 2014 edition of the Town of Victor NRI is the Third Printing. Corrections have been made following the previous printings.

Many thanks to everyone that contributed content, allowed use of their printed material and photographs, served on the Town Board and Conservation Boards from 1990 to 2014 and served on committees to develop content.

Victor Conservation Board members that contributed to the NRI include Lorraine Atwood, Donna Clements, Kate Crowley, Marge Elder, Larry Fisher, Maureen Hiler, John Hotto, Kenneth Kolaczyk, and Stephanie Richards. Town Board members that served on committees and participated in evaluations include Jeff Cody and Jack Dianetti. Leslie Connell has served continuously as Board Secretary to support the multiple printings and the outreach efforts that are required to collect field data.

Other significant acknowledgements are included in Section 9 – Acknowledgements.

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VICTOR'S FIRST NATURAL RESOURCE INVENTORY - 1860

VICTOR—was formed from Bloomfield, May 26, 1812. It is the n. w. corner town of the co. The n. part is occupied by the drift ridges, which rise 50 to 150 feet above the general surface. A ridge of 100 to 280 feet in height extends across the s. part in a general e. and w. direction. The principal streams are Irondequoit, Mud, Hog Hollow, and Fish Creeks, and Trout Brook. The soil in the center and n. is a light, sandy and gravelly loam, but in the s. e. it is principally clay. It is particularly adapted to the cultivation of potatoes and root crops. Victor, near the center, contains about 75 dwellings. The Indian village of Gannagaro, which was destroyed by the Marquis de Nonville (sic), was situated near this place. Fishers (p. o.) is a station on the N. Y. C. R. R., in the w. part; and East Victor is a hamlet, on Mud Creek The first settlement was commenced in 1789, by immigrants from Stockbridge, Mass. Among the first were Enos and Jared Boughton, and Jacob Lobdell. Rev. Reuben Parmelee, from Goshen, the first settled minister, came to the town in 1798.

Source: *Gazetteer of the State of New York; embracing a comprehensive view of the geography, geology, and general history of the State, and a complete history and description of every county, city, town, village, and locality, with full tables of statistics.*

By French, J. H. (John Homer), 1824-1888.Member of the American Association for the Advancement of Science; corresponding member of the New York Historical Society, of the Albany Institute, etc. Illustrated by Original Steel Engravings, and accompanied by a new map of the State from Accurate Surveys. Syracuse, NY; Published by R. Pearsall Smith.1860. p. 499

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NATURAL RESOURCE INVENTORY & ASSESSMENT

TOWN OF VICTOR, NEW YORK

APRIL 2014

Volume 1

Victor's Natural Resources



1. VICTOR'S GEOLOGY

1.1 BEDROCK

Bedrock is a layer of undisturbed rock usually located beneath a surface layer of soil or other material. Bedrock forms the upper surface of the rocky foundation that composes the earth's crust. The crust, the outermost layer of the earth, ranges from 3 to 44 miles thick. In areas of high erosion, bedrock may become exposed to the surface. A surface exposure of bedrock is called an outcrop. Bedrock bodies in western New York are layers of sedimentary rock, of greatly different thicknesses, that are slightly tilted to the south (by less than 1 degree). Throughout the majority of Victor, soils left by the last of several receding glaciers cover the bedrock.



Photo 1.1 Great Brook Bedrock (Photographer: Larry Fisher)

Victor's bedrock is visible in various streams throughout the Town, including outcrops in Irondequoit Creek adjacent to Main Street Fishers, in Great Brook visible from the Ganondagan trail off of Boughton Hill Rd, and in Mud Creek. Figure 1.2 illustrates the layers of bedrock in Victor and neighboring areas.

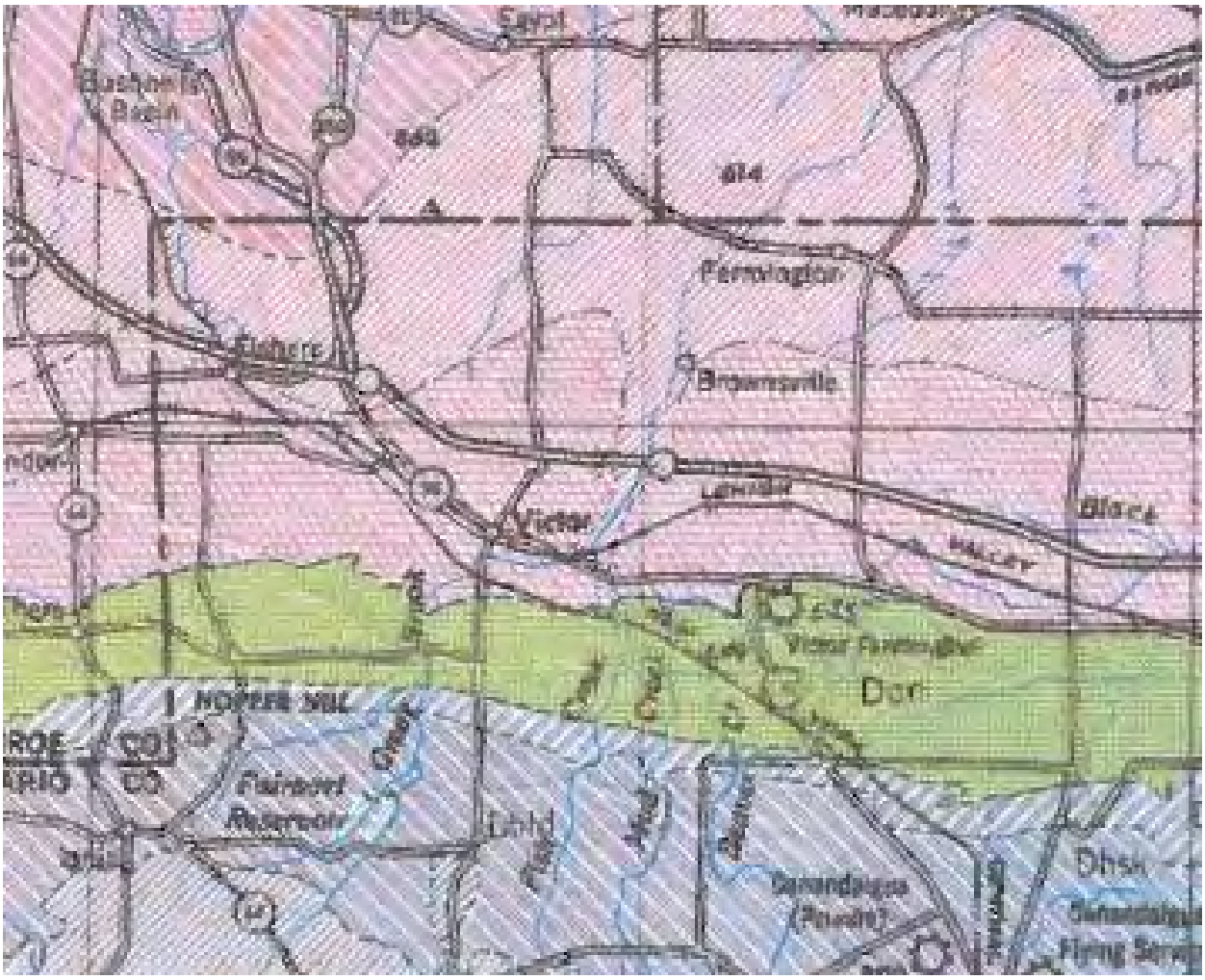


Figure 1.2 Bedrock

The Paleozoic Era spanned from roughly 242 to 251 million years ago. The different colors on Figure 1.2 represent different layers of bedrock at or near the surface, the pink being the oldest and the striped blue-grey the youngest. Since Victor's Marcellus shale layer (depicted on Figure 1.2 as the striped blue-grey) is near the surface, any natural gas contained therein will dissipate into the air. Therefore, Marcellus Shale hydraulic fracturing will not be economically viable in Victor. The Utica Shale layer, which could also be a prime resource for natural gas mining via hydraulic fracturing, is not shown above because it lies approximately 2000 feet below the surface.

1.2 TOPOGRAPHY

Glaciers literally carved out the Victor landscape we know today. Streams, lakes and ponds, drumlins, eskers, kames, moraines, kettles, bogs, rolling hills and valleys - all are relics of glacial topography. About 18 thousand years ago, the last receding (melting) glacier formed vast lakes, engulfing Victor and extending south into Pennsylvania, west to the Huron and Erie valleys, and east to Syracuse.

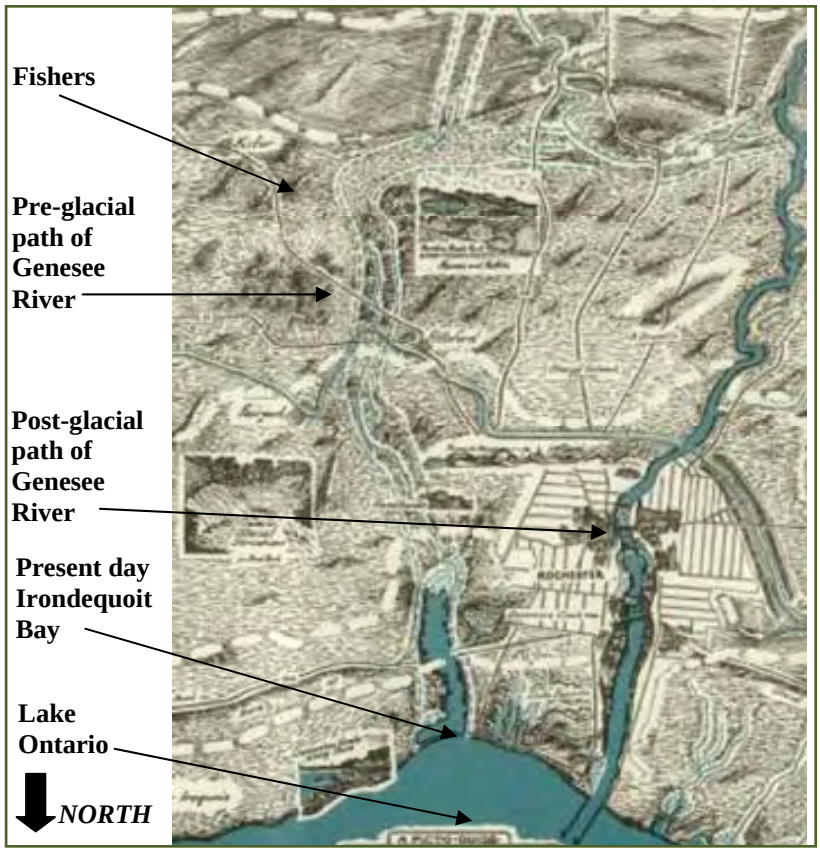


Figure 1.3 Old Ontarion River

The Route 96 corridor is a large east-west trending valley that divides the Town into two halves. This valley served as a drainage outlet for the melting glacier as it retreated toward Lake Ontario. This valley is part of a deeper buried valley that curves through the northwest corner of the Town and towards Irondequoit Bay. The light-blue dotted parallel lines on Figure 1.3 indicate the route of this deeper buried valley, which is the preglacial route of "the Old Ontarion River," now known as the Genesee River (see Appendix B). The current (post-glacial) route of the Genesee River is also shown on Figure 1.3.

The most prominent lake stage in Victor was glacial Lake Warren at elevation 850 to 900 feet. Sands and gravels mark many of Victor's hillsides at this elevation, and the finer sediments of the glacial lake floor exist in its lower elevations. As Lake Warren's water levels dropped, they drained to the east through the east-west corridor. The stagnant ice left over from the glaciers slowly melted and was buried by the outwash sediment in the northwest corner of the Town, present-day Fishers. As the ice melted, sediments were left behind



Photo 1.4 Drumlin (Photographer: Marge Elder)

creating the glacial terrain that plays an important role in creating the "character" of Victor. These topographic features include drumlins, eskers, kames, moraines, kettles, and steep slopes.

Drumlins

Drumlins are glacial landforms characterized as low, smoothly-rounded elongated hills sculpted beneath the ice of a flowing glacier. They are composed of compacted glacial till, unsorted material deposited directly by glacial ice. While some drumlins have irregular shapes, a classic drumlin is blunt at one end and tapered at the other end. The blunt end faces the direction from where the glacier originated, while the gentler slope indicates the direction in which the glacier was advancing. The long axis of a drumlin parallels the flow direction of the ice. Victor's drumlins lie on a north to south axis, since the glaciers covering our area originated in the Arctic regions to the north and extended south into Pennsylvania.

Drumlins often occur in packs of large fields, creating "rolling hill" topography. As shown on Map 1.12, the swarm of drumlins in Victor's northeast quadrant continues into the southeast quadrant. Boughton Hill is a large drumlin which is shown as the north/south orange-colored shape between the village boundary and the Route 444 symbol on Map 1.12.

Esker

Eskers are ridges of sand and gravel representing drainage networks associated with glacial retreat or stagnation. They are straight to sinuous ridges of sand and gravel that follow the general ice flow direction, but often deviate to follow valleys. Eskers vary in length from hundreds of feet to hundreds of miles, and can be 100 or more feet high.



Photo 1.5 Esker (Photographer: Larry Fisher)

Kame

Kames are hills or small mounds of glacial sediments, composed of sand and gravel and formed in the glacial melting zone. Therefore, they are stratified and more permeable than glacial till. The most massive kame hills in the region, and possibly in western New York, are in the southwestern part of the Town of Victor, extending into the towns of East and West Bloomfield and into the southwest corner of Mendon. They cover an area of approximately ten square miles and attain an elevation of over 1,100 feet in the Hopper Hills area. This highest point in the Town of Victor is located on private property in the Hopper Hills area, as seen in Figure 1.7. The yellow area on Figure 1.7 corresponds to the red coloration on the inset to the left indicating Hopper Hills.



Photo 1.6 Kame (Photographer: Lorraine Atwood)



Figure 1.7 Inset: Southwest Corner of Victor

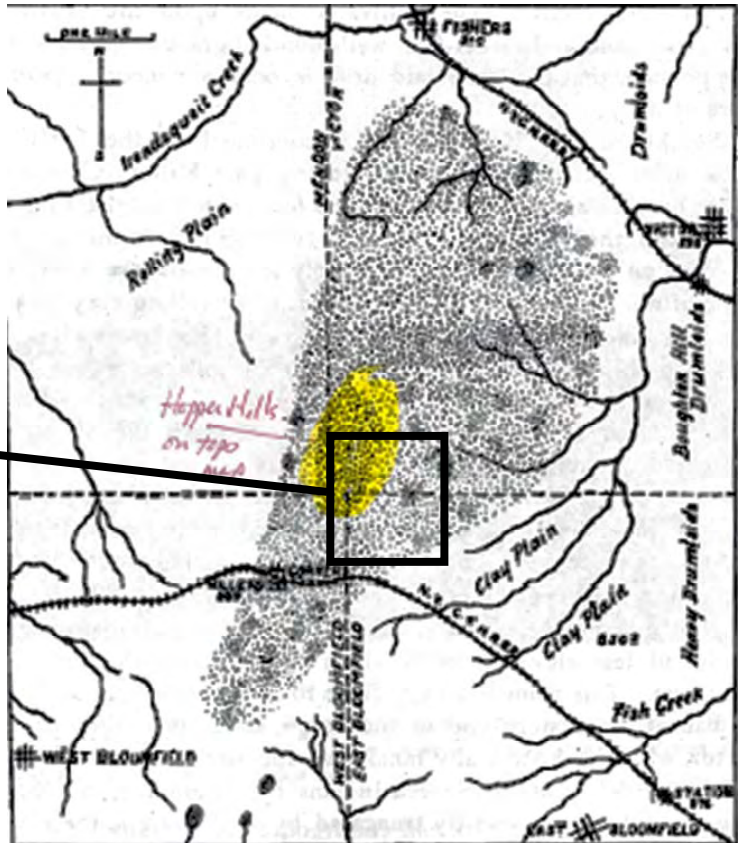


Figure 1.7 Victor Kame Area: H.L. Fairchild 1896

The Town of Victor is shown in the northeast quadrant of Figure 1.7. Note correspondence of yellow area indicating Hopper Hills to the red coloration on the map clip to the left. Red indicates higher elevation. This area encompassing the southwest portion of the Town of Victor contains the highest point in Victor (1,104 ft.)

Moraine



Photo 1.8 Moraine (Photographer: Lorraine Atwood)

A moraine is a glacial landform consisting of unsorted rock material that was transported by a glacier and deposited by the ice or meltwater. Moraines mark the outermost extent of a glacier's progression. About 12,000 to 13,000 years ago, the last ice sheet retreated from this area. As it did, it surged forward, retreated, and halted. This created ridges, or moraines, along its track. Two of these ridges pass through Victor and are important in understanding the occurrence and quality of groundwater in this area.

The southwestern portion of the Town between Dryer Road and County Road 41 (Boughton Hill Road) contains the larger of the two moraines. As this moraine is extremely sandy, unlike the local bedrock, it likely represents a substantial ice surge from the north. Sandy glacial outwash and lake sediments were transported and deposited in front of the glacier to form the moraine. The location of the limestone bedrock in this area acted as a barrier to the ice movement, which affected the size and shape of this moraine. This bedrock is partially responsible for the steepness of the moraine relative to the topography of the region.

Photo 1.8 shows the moraine between County Road 41 and Dryer Road, looking north from Murray Road. The moraine is the entire hill at the horizon. Fort Hill is the mowed area atop the moraine, left of center. The moraine is also evident as the elevated orange area in Figure 1.9. Sand and gravel pits along Malone Road are located in this area between Dryer and County Road 41. The amount of sand in the moraine suggests that it was an island in glacial Lake Warren.

As the glacier retreated to the north, a smaller, discontinuous moraine was formed as the ice halted in the area north of the Thruway. The newly exposed region to the south was deposited with



Figure 1.9 Digital Elevation Map of Victor

fine sand, silt, and clay in the lakes adjacent to the ice.

Kettle

Kettles are basin- or bowl-shaped features found only in glacial deposit areas. Kettles are formed when blocks of ice detach from the glacial mass and are buried under sand and gravel. When the ice-block melts, the cover slumps in, producing the basin, or kettle. Sometimes kettles fill with groundwater and become a kettle lake. Victor has a number of kettle lakes (refer to Volume 1, Section 7/ Victor's Open Space for more photos and locations of kettles in Victor's Northwest quadrant.) Photo 1.10 of Crossman's Pond illustrates a kettle lake on Lower Fishers' Road. This kettle lake is estimated to be 60 feet deep. According to local lore, people used to drop lines down to try and touch the bottom, calling it the "bottomless pond."



Photo 1.10 Crossman's Pond (Photographer: Larry Fisher)

1.3 STEEP SLOPES

Slope is a term used to describe the rate of elevation change between two points, and relates to the topography of land surface. Slope is derived from elevation contour maps by measuring the vertical elevation change (rise) between two points and dividing that change by the horizontal distance (run) between the two points.



Photo 1.11 Steep Slope (Photographer: Larry Fisher)

Victor's topography includes rolling hills and steep slopes. Slopes greater than 15% are typically considered "steep" by planners, for agricultural purposes, and by developers. Steep slopes, combined with highly erodible soils, are not conducive to agriculture, and most farmers did not attempt to grow crops on them. Therefore, steep slope areas in Victor typically contain the most mature woodland habitats on a given property. The tree's root systems

help to maintain slope stability. For additional information on Steep Slopes and the recommended policy see Section 15.

Steep Slope Sensitivity

Steep slopes are sometimes unsuitable for house construction, streets, and septic systems because of the extensive grading that would be required. However, slopes need to be evaluated on a case-by case basis to determine suitability for development. Among the factors to consider when evaluating the slope are its height, steepness, stability, soil and bedrock, vegetative cover, wildlife habitat, co-occurrence/diversity, and hydrological features. In addition, development must be consistent with the Town of Victor's Comprehensive Plan, Steep Slope Policy (refer to Volume 2, Section 15), and other relevant Town regulations.

In a 1996 publication, Robert Olshansky, an expert on hillside development, identified topics that should be considered related to development on slopes:

- Many highly erodible soils are located on steep slopes.
- Slopes are naturally unstable due to constant gravitational pull. Slope stability is also compromised by wind, water, rain, snow, ice, groundwater, and physical disturbance. Tree removal impacts slope stability.
- Adverse effect on water quality due to increased erosion and sedimentation, which can decrease the drainage ability.
- Infrastructure, sewer, water and power lines are difficult and expensive to extend up steep slopes and to maintain after construction.
- Access roads and driveways tend to be longer with more curves and grading for safety, thereby impacting more of the hillside.
- Aesthetic qualities of ridgelines can be lost when they are developed.
- Hillsides tend to be developed after flatter areas. Wildlife species often take refuge on underdeveloped hillsides, even if it is not their native habitat, because their preferred habitat has been developed.

Steep Slope Assessment Tool

The 1995 Victor Comprehensive Plan identifies steep wooded slopes as a high priority for protection. However, at that time and for many years thereafter, the Town of Victor did not have a definition for steep slopes nor had the Town established guidelines for protection and development. As a result, development projects containing steep slopes inevitably face controversy and delays in the approval process.

A Steep Slope Policy was prepared for the Town of Victor by LaBella Associates in 2013. The policy identifies the factors to be considered in evaluating proposals with the potential to affect steep slopes. In addition, a Steep Slope Assessment Tool was created at the same time to indicate the general level of scrutiny required for a given proposal. The Steep Slope Policy and

Assessment Tool, found in Volume 2, Section 15 includes recommendations relative to review requirements and other aspects of policy implementation.

Map 1.12 and Map 1.13 that follow give a sense of the steep slopes found in the Town of Victor.

1.4 FURTHER INFORMATION

In 1987, the Victor Conservation Board commissioned Dr. Richard A. Young, Distinguished Professor of Geological Sciences, SUNY Geneseo, to conduct a Victor groundwater resources study. The result was a publication entitled *Groundwater Resources in the Town of Victor, New York*, by Dr. Young. The publication can be found on the Town's website at http://www.victorny.org/ follow the [Town Government] link to [Boards & Committees] to the Town Conservation Board.

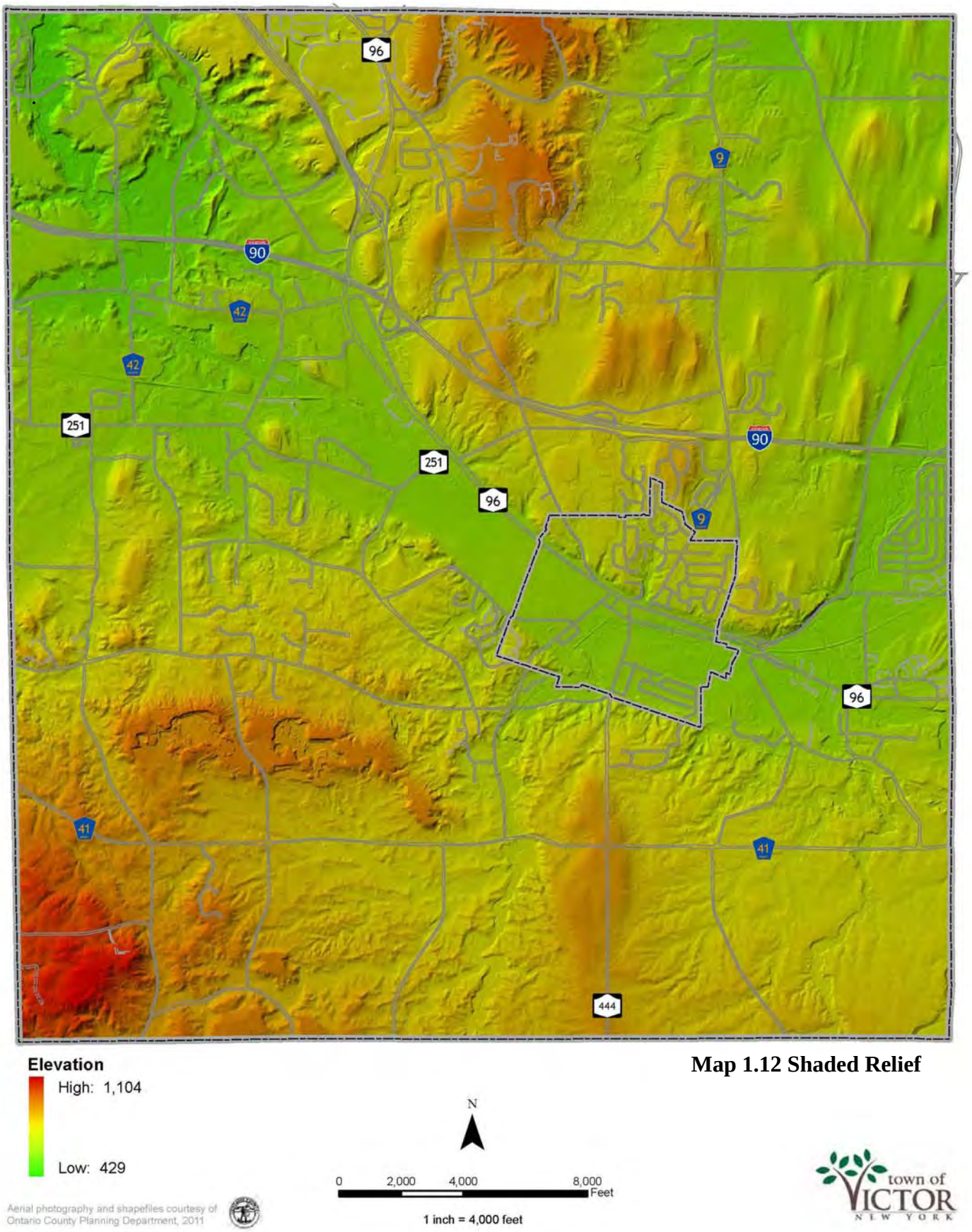
The purpose of Dr. Young's study was to:

- Update, coordinate and interpret general geologic information already available in different formats. The maps accompanying this report were prepared in order to characterize and illustrate the available geologic information that could be useful in the understanding and protection of the Town of Victor's groundwater resources.
- Extract from larger, more general studies the specific types of information that are the most useful and to focus the study on the limited area of the Town.

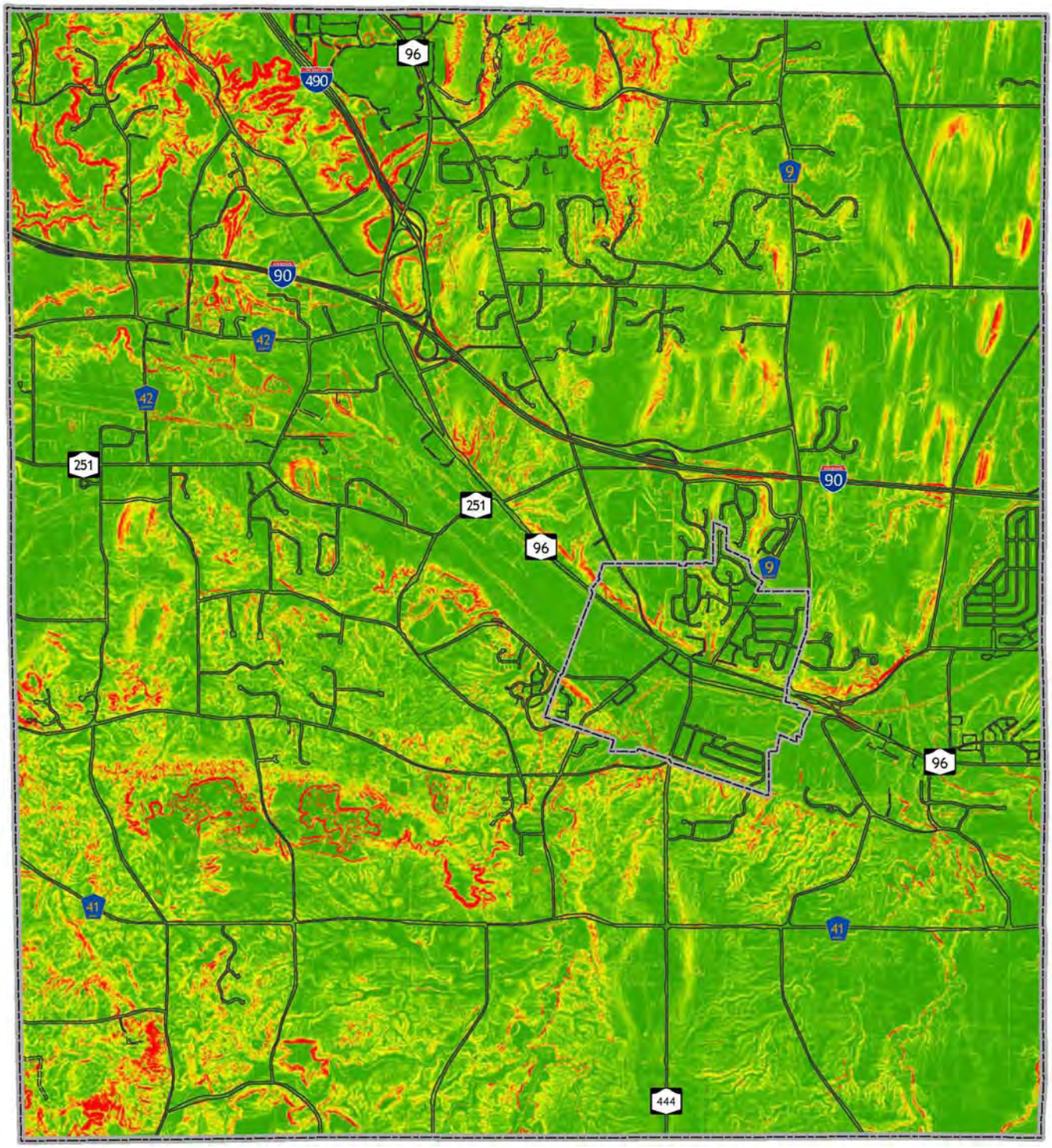
The material in Dr. Young's report is in a usable (practical) format that is compatible with Town of Victor existing land use maps at a reasonably large scale (1 : 12,000). This compatibility allows map overlay in order to identify the geologic/groundwater features of specific parcels.

Dr. Young's report identifies and evaluates permeability of areas within the Town, the first step in groundwater protection. The Town can use this and other information from the report as it develops management options that would help protect the groundwater from pollution as well as protect recharge areas.

As the Town expands its water district, fewer residents depend on drilled wells for their drinking water. That said, protection of our groundwater contributes to healthy streams, wildlife habitats and vegetation as well as a high quality of life within the Town and beyond our boundaries.



Map 1.12 Shaded Relief



Map 1.13 Steep Slopes

Percent Slope

0 - 5	25.1 - 30
5.1 - 10	30.1 - 35
10.1 - 15	35.1 - 40
15.1 - 20	40.1 - 45
20.1 - 25	45.1 and up

Aerial photography and shapefiles courtesy of Ontario County Planning Department, 2011

N

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

town of VICTOR NEW YORK



2. VICTOR'S WATER RESOURCES

2.1 GROUNDWATER / AQUIFERS

Groundwater is water that flows or seeps downward and saturates soil or rock, supplying springs and wells. Groundwater often begins as precipitation and soaks into the ground where it is stored underground in rock crevices and in the pores of geologic materials. Groundwater is the source of about 38 percent of the water that county and city water departments supply to households and businesses. It provides drinking water for more than 97 percent of the rural population who do not get their water delivered to them from a county/city water department or private water company. Groundwater, which is found in aquifers below the surface of the Earth, is one of the Nation's most important natural resources.

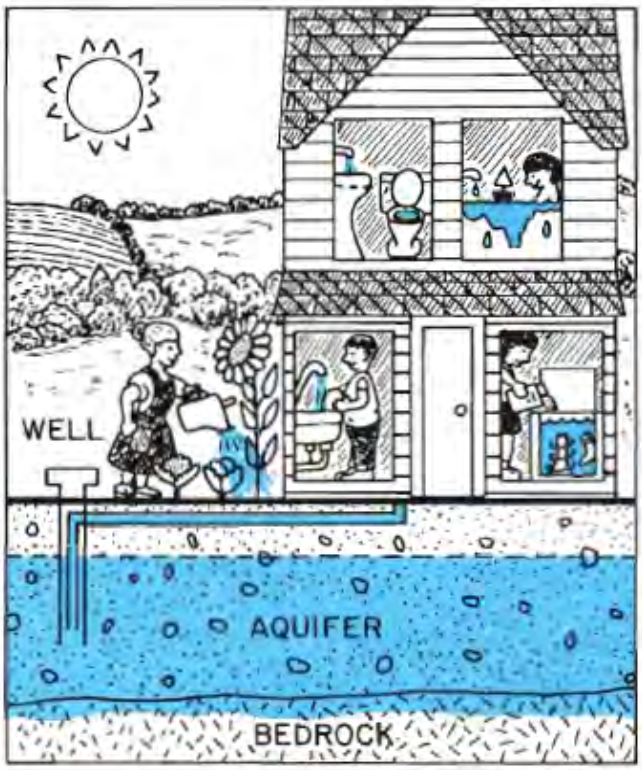


Figure 2.1 Aquifer

An aquifer is a geologic formation that can store and transmit water to wells, springs and some streams (see Appendix C). An aquifer is more like a sponge than an underground river. Geologic materials have connected pores that allow water to move from one space to another. These are called unconsolidated sediments, which range from clay, sand, or gravel. Unless the rock is fractured, water does not move through large, hollow tunnels at rapid rates. Many of Victor's aquifers have unconsolidated sediments. The upper surface of the saturated zone of an aquifer is called the water table.

Wells can be drilled into aquifers and water pumped out. Precipitation adds water back into the porous rock of the aquifer which is called recharge. The rate of recharge must be considered when pumping water from a well,

as it is not the same for all aquifers. Pumping too much water too fast draws down the water in the aquifer and might eventually cause a well to yield less water or run dry. This concept is known as groundwater mining. According to Richard Young's Permeability Analysis shown on Map 2.15, Areas I to IV are of higher surface permeability, indicating more effective recharge areas of groundwater. Areas V to VIA & VIB have lower surface permeability.

A confined aquifer is a layer below the land surface that is saturated with water and confined by layers of impermeable material both above and below, causing the aquifer to be under pressure. When a confined aquifer is penetrated by a well, the water will rise above the top of the aquifer sometimes all the way to the surface, creating a flowing well. A well tapping into a confined aquifers is typically referred to as an artesian well. Victor has a number of artesian wells.

Groundwater/Aquifer Sensitivity

Water quality within an aquifer can be affected by precipitation and stormwater runoff, which is absorbed by the soil and percolates down to the aquifer (see Appendix C). If the rain or stormwater becomes contaminated, those contaminants potentially affect a community's or homeowner's water supply. Common sources of groundwater contamination are:

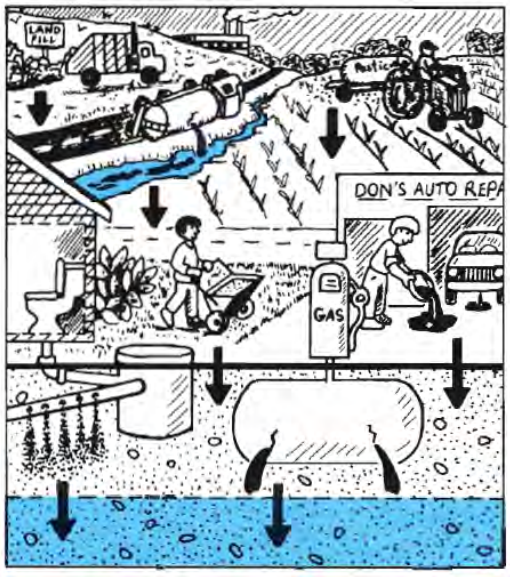


Figure 2.2 Aquifer Pollution Sources

- Septic systems
- Pipeline breaks
- Improper use and disposal of pesticides by farmers, homeowners, businesses & industries
- Leaks and spills at industrial and commercial facilities
- Improper commercial and industrial disposal
- Landfills
- Storage and use of road deicing salts
- Liquid waste storage lagoons
- Agricultural and lawn fertilization
- Disposal of animal wastes
- Leaking underground storage tanks
- Inadequately sealed walls.

2.2 WATERSHED AND STREAMS

A watershed, or drainage basin, is the area of land where all of the water, above or below ground, converges at a point. The watershed boundary is determined topographically by ridges or high elevation points, within which the water flows downhill to the lowest elevation point. A sub-watershed is just a smaller watershed within a larger watershed: an example being the (smaller) watershed of a stream which is a tributary to a river (larger watershed.) Watersheds come in all shapes and sizes and cross municipal, county, state and national boundaries.

Victor has two watersheds (see Map 2.16 and Volume 2, Section 13 for more information):

- The Central Lake Ontario Irondequoit-Nine Mile Watershed, or the Irondequoit Creek Watershed, originates in Victor and Mendon and flows into Lake Ontario through Irondequoit Bay.
- The Finger Lakes Upper Seneca River Watershed, or the Ganargua Creek Watershed, flows into Lake Ontario at Oswego. Although Victor contains Ganargua Creek and several of its tributaries, this watershed originates south and east of the Town boundaries.

Stream Classification – NYS Department of Environmental Conservation

The Town of Victor has approximately 108 miles of streams, of which about 78 miles have been classified by the New York State Department of Environmental Conservation (NYSDEC). NYSDEC classifies most water bodies within the State, including lakes, based on water quality and the best use for the water, as shown in Table 2.3.

CLASS	BEST USE
AA	Drinking (after chlorination)
A	Drinking (after chlorination and filtration)
B	Bathing
C(T) (TS)	Fishing (Trout) (Trout Spawning)
C	Fishing
D	Secondary contact recreation

Table 2.3 NYS DEC Stream Classifications

The highest quality and most pristine waters are given a classification of AA, while the most degraded or lowest quality have been assigned a classification of D. Stream Classes A, B, and C may also have a standard of (T), which indicates the stream may support trout populations, or (TS), indicating the stream may support trout spawning. Streams having a classification of C(T) or higher are considered by NYS to be protected streams and are subject to stream protection provisions.

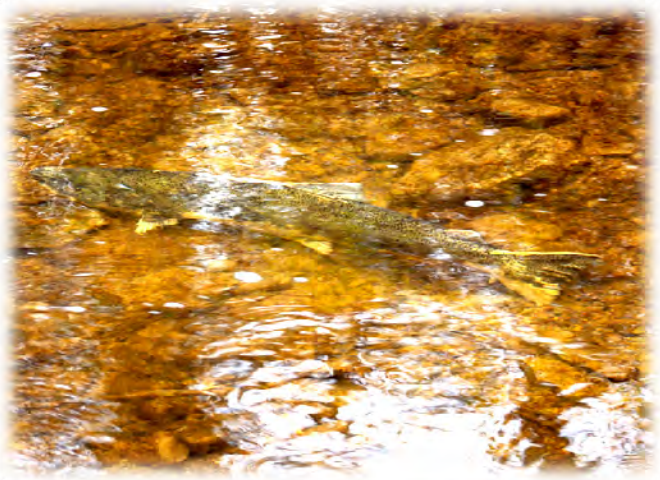


Photo 2.4 Coho Salmon, Irondequoit Creek
(Photographer: Marge Elder)

Irondequoit Creek has significant concentrations of steelhead (lake-run rainbow trout), brown trout, and coho salmon, as shown in Photo 2.4. These salmonids migrate from Lake Ontario through Irondequoit Bay and enter the creek to spawn. Irondequoit Creek is an important natural feature and Victor hosts the headwaters.

Stream Classification - US Army Corps of Engineers (USACE)

There are three types of US Army Corps of Engineers classified streams[1], which include perennial streams, intermittent streams, and ephemeral streams. A perennial stream has flowing water year-round during a typical year. The water table is located above the streambed for most of the year. Groundwater is the primary source of water for stream flow, while runoff from precipitation is a supplemental source. Perennial streams support a diverse aquatic community of organisms year round and are typically the streams that support major fisheries. Great Brook, shown in Photo 2.5, is a perennial stream.



Photo 2.5 Great Brook (Photographer: Marge Elder)

[1]Small ponds and lakes with a surface area of 10-acres or less, located within the course of a stream, are considered to be part of a stream and are subject to regulation under the stream protection category of Protection of Waters.

An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow. The biological community of intermittent streams is composed of species that are aquatic during a part of their life history or move to perennial water sources.

An ephemeral stream has flowing water only during and for a short time after precipitation events in a typical year. Ephemeral streambeds are located above the water table year-round. Groundwater is not a source of water for the stream. Instead, runoff from precipitation is the primary source of water for stream flow. Ephemeral streams typically support few aquatic organisms. When aquatic organisms are found, they typically have a very short aquatic life stage.

Ditches can also act as streams if they intercept enough groundwater to have either intermittent or perennial flow. These channels can have enough flow to support aquatic life and would be considered Waters of the United States under United States Army Corps of Engineers jurisdiction.

Based upon the National Hydrography Dataset[2], about 39 miles of streams within the Town of Victor are considered to be intermittent, while there are approximately 60 miles of perennial streams. More detailed information on streams and the two watersheds in Victor can be found in Volume 2, Section 13.

Stream Sensitivity

NYS DEC produces a Waterbody Inventory / Priority Waterbodies List (WI / PWL)[3] of water bodies that may be impaired or prevented from achieving the "best use" assigned to them in DEC's classification system found in the Table 2.3.

As of 2007, the following streams in Victor have suspected impacts or impairment:

- Irondequoit Creek and tributaries – Aquatic life and recreational uses are stressed due to phosphorous, silt and sediment. The sources of pollutants are cited as urban and stormwater runoff, and possible agricultural practices, streambank erosion, or other sanitary discharges.

[2]Although the National Hydrography Dataset is intended to be a comprehensive set of digital spatial data that represents the surface water of the United States, there are about 8.5 miles of NYS DEC Classified streams that do not appear within the National Hydrography Dataset. The Dataset is the culmination of efforts by the US Environmental Protection Agency and the US Geological Survey USGS. Efforts are made to update it continually.

[3]The Waterbody Inventory/ Priority Waterbodies List is updated periodically (on a 5-year cycle) for each drainage basin within New York. Two or three major drainage basins in New York are updated each year. The Town of Victor is divided by two drainage basins: the Central Lake Ontario sub-basin and Oswego/Finger Lakes basin. The WI/ PWL were scheduled to be updated in 2011, but updates have been delayed.

- Ganargua Creek and tributaries – Aquatic life is stressed due to pollutants such as phosphorous, suspected silt and sediment, and potential ammonia. Construction related to development, stormwater runoff, and agriculture are sources of pollution.
- Great Brook and tributaries – Aquatic life and recreational uses are suspected to be impaired, while aesthetics are known to be stressed. Pollutants include phosphorous, silt and sediment, floatables (aesthetics), and decomposition of organic matter that consume dissolved oxygen. Known sources of pollutants include stormwater runoff, while suspected sources include municipal wastewater discharge and agriculture. In June 2010 this stream was included in Section 303(d) List of Impaired Waters Requiring a Total Maximum Daily Load or other strategy to reduce pollutants. However, a pollution reduction strategy was deferred until verification of impairment was made.
- Mud Creek and tributaries – The aquatic life in Mud Creek is known to be stressed due to phosphorous pollutants, and suspected ammonia, chlorine, silt and sediment, as well as having a reduced dissolved oxygen level. Known sources of pollution include agriculture, construction related to development, and stormwater runoff. Municipal wastewater discharge is also suspected of being a source of pollution.

Victor's streams are stressed because Victor's stormwater runoff can transmit:

- Pet wastes from streets and sidewalks,
- Nutrients from lawn and agricultural fertilizers,
- Leaves, grass clippings, and paper from residential areas, and
- Sediment from eroding surfaces.

Decomposition of these materials consumes oxygen, thereby robbing other aquatic organisms of the oxygen they need to live.

2.3 FLOODPLAINS

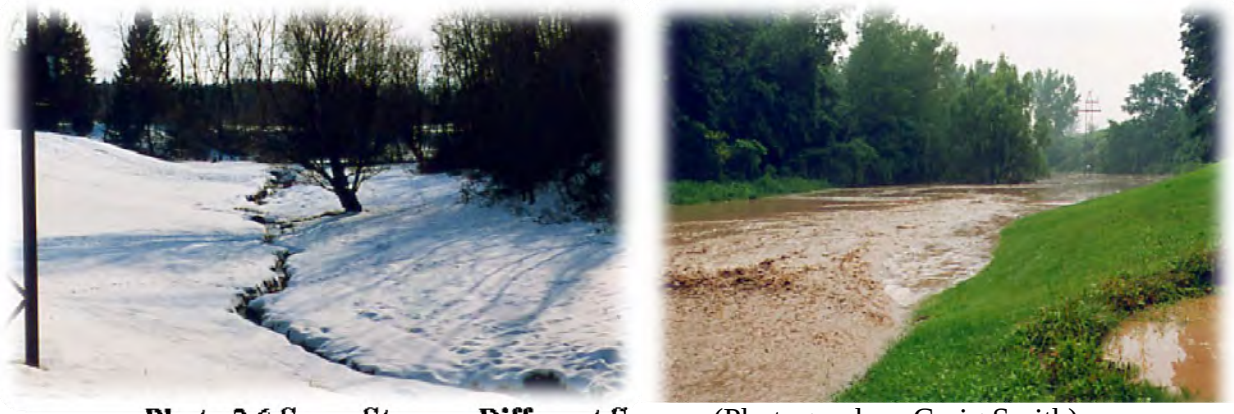


Photo 2.6 Same Stream, Different Season (Photographer: Craig Smith)

Floodplains are low areas adjacent to streams and rivers that are susceptible to being inundated by floodwaters. Floodplains are generally flat or nearly flat areas of land and include the floodway and the flood fringe, as defined by the Federal Emergency Management Agency (FEMA). As floodplains provide storage of floodwaters, the protection of these storage areas is critical to minimize flood damage impacts.

Floodplain Management

According to FEMA, a "regulatory floodway" refers to the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without increasing the water surface elevation more than a designated height. Water flow within the floodway is swift. The flood fringe provides additional storage for floodwaters during major storm events.

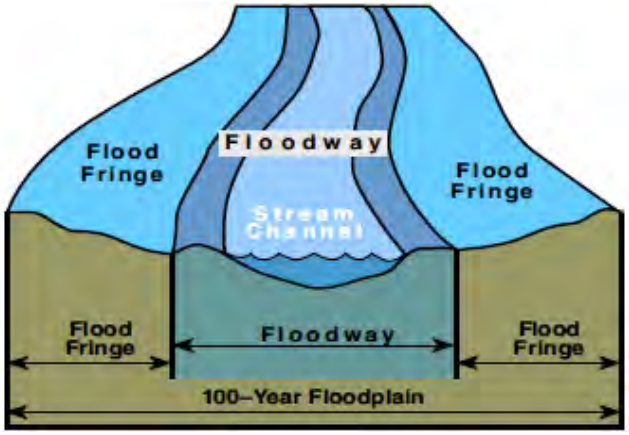


Figure 2.7 Floodway and Flood Fringe
(Source: Ohio Dept. of Natural Resources)

Floodplain regulations are land use controls that govern the amount, type, and location of development within defined flood prone areas. Floodplain management not only improves public safety, but also decreases development on sensitive areas near water bodies and protects and improves water quality. FEMA requires that communities regulate development in floodways to ensure that there are no increases in upstream flood elevations. FEMA does not regulate development in the flood fringe. For streams and other watercourses where FEMA has provided Base Flood Elevations (BFEs) but no floodway has been designated, the community must review floodplain development on a case-by-case basis to ensure that increases in water surface elevations do not occur. The community may also identify the need to designate a floodway if adequate information is available.

FEMA has provided floodplain mapping for several areas within the Town of Victor, but not all of the Town's floodplains have been mapped. The Flood Insurance Rate Maps (FIRMs) indicate the approximate areas where flooding would occur under certain rainfall or weather conditions.

The National Flood Insurance Program (NFIP) enables property owners in participating communities to purchase flood insurance in exchange for State and community floodplain management regulations that reduce future flood damages. In order to participate in the NFIP, municipalities are required to adopt and enforce ordinances restricting development in the 100-year floodplain. Local floodplain regulations can define a more specific hazard area or a larger hazard area, such as a 500-year floodplain, and can limit certain types of construction within flood hazard areas. The Town of Victor is a participating member of the National Flood Insurance Program.

Floodplain Sensitivity

The NFIP floodway standard in 44CFR 60.3 (d) restricts new development from obstructing the flow of water and increasing flood heights. However, this provision does not address the need to maintain flood storage. Especially in flat areas, the floodplain provides a valuable function by storing floodwaters. When fill or buildings are placed in the flood fringe, the flood storage areas are lost and flood heights will go up because there is less room for the floodwaters. This is particularly important in smaller watersheds, which respond sooner to changes in the topography.

During flooding, large amounts of organic pesticides, nutrients and sediment bound pollutants such as phosphorous can be exported from agricultural land and into major waterways or aquifers. On the other hand, floods can reinvigorate soil by depositing nutrient rich silt. This can have tremendous impacts to ecology of floodplain, including habitats or water quality.

As recent history has demonstrated, development in floodplains has the potential to cause damage to or loss of property, among other economic impacts. Impervious surfaces, including structures, in floodplains can intensify flooding since they diminish the storage capacity of the floodplain and force floodwaters to overflow into areas beyond the floodplain. To better understand the role of floodplains as part of a co-occurrence, visit Volume 2, Section 13.

2.4 HEADWATERS & SEEPS

A headwater stream is a source of the water from which rivers and streams arise. Many of the lakes and streams in Victor originate as small headwater streams or wetlands. These entities critically influence the character and quality of downstream water sources. Headwater streams benefit humans by mitigating flooding, recycling nutrients, providing habitat for plants and animals, and maintaining water quality and quantity. Additional information on headwaters and seeps is provided in Appendix E.



Photo 2.8 Headwater Stream (Photographer: Larry Fisher)

The headwater stream in Photo 2.8 originates from a productive spring in Fishers Park. The stream is a tributary of Irondequoit Creek. Small headwater streams like this are the lifeblood of our streams and rivers. Protecting them is essential to preserving a healthy freshwater ecosystem and protecting our freshwater resources.

A seep is where groundwater becomes surface water. According to the EPA, spring seeps are small wetlands typically found in sloping terrains. Groundwater reaches the surface through a distinct hole from which shallow, flows move broadly outward and create a saturated zone. The groundwater typically flows year round and has a relatively constant temperature, usually between 50 and 60 degrees F.



Photo 2.9 Seep (Photographer: Marge Elder)

Spring seeps are essentially discharge wetlands, though they can provide recharge functions under some conditions. In winter, the warm groundwater from spring seeps melts snow, creating snow-free zones rich in food sources for terrestrial wildlife. Seeps are habitat for many aquatic species such as salamanders and frogs. The seep in Photo 2.9 is among many that provide water to a stream that flows through a large federal wetland. Notice the distinct hole in the center of the pile of mud in Photo 2.9.

Given Victor's extensive hydrological features, conservation of seeps and headwaters is imperative to sustaining a healthy aquatic ecosystem. Human-induced changes including filling of wetlands and streams, water pollution, and introduction of exotic species diminish the biodiversity of small freshwater systems. Land-use changes in headwater systems impact the streams, lakes, and rivers downstream. Such changes include clearing or modifying vegetative cover, increasing impervious material, and channelizing or eliminating streams, all of which reduce the amount of rainwater, runoff, and snowmelt the network of streams can absorb before flooding.

Increased volumes of water in headwater streams intensifies erosion. When the stream channel is widened, it promotes bigger and more frequent floods and decreases the effectiveness of the stream to recharge groundwater, trap sediment, and recycle nutrients. Downstream lakes and rivers suffer poorer water quality, less reliable water flows, and less diverse aquatic life. Algal blooms and fish kills can become more common, and recreational and fishing uses may be compromised. Mitigation and restoration of headwater streams and downstream lakes and rivers can be costly for municipalities, industry, and residents of the area.

2.5 RIPARIAN ZONES & BUFFERS

A riparian zone is the land area directly bordering the stream edge (see Photo 2.10). It is pivotal in stream protection. A riparian buffer is a legal term referring to existence of trees, brush and grasses in a riparian zone, whether natural or planted. Studies reveal that these buffers protect streams from pollutants. The vegetation shades the stream, maintaining appropriate water temperature, and filters pollutants generated by human development and agricultural uses.

Natural riparian buffers are disappearing in developed areas. Often mown lawns replace the natural growth. Grasses are effective in filtering sediment and the pollutants carried therein, but mown lawns do not have the same filtering action as naturally growing grasses and they eliminate almost all of plant and animal habitat. Lawns along streams can add to pollution through grass clippings, lawn fertilizers, etc. See Appendix D for an extensive discussion of riparian buffers.



Photo 2.10 Riparian Zone
(Photographer: Marge Elder)

2.6 WETLANDS



Photo 2.11 Manmade Pond
(Photographer: Marge Elder)

In general, wetlands are transitional areas between uplands and aquatic systems (streams, ponds, etc.) where the water table is usually at or near the surface or the land is covered by shallow water. They include swamps, marshes, bogs, fens, and vernal ponds, as well as, and the fringes of lakes, ponds, rivers and streams. Photo 2.11 shows a Federal wetland that includes a manmade pond created years ago. A stream system flowing through the wetland is fed by springs, seeps, and stormwater runoff.

Wetland Benefits

Fish, wildlife and plant habitats

Source of substantial biodiversity.
Produces great quantities of food.
Development of organisms that form the base of the food web.
Birds and mammals rely on wetlands for food, water, and shelter, especially while migrating and breeding.
43% of the federally threatened and endangered species rely directly or indirectly on wetlands for their survival.

Natural water quality improvement

Provides the conditions needed for the removal of nitrogen and phosphorus from surface water.
Improves drinking water quality by intercepting surface runoff, removing or retaining inorganic nutrients, processing organic wastes, reducing suspended sediments.
Reduces environmental problems such as algal blooms, dead zones, and fish kills, that are generally associated with excess nutrients.

Flood storage

Stores and slowly releases surface water, rain, snowmelt, groundwater and flood waters.
Wetland vegetation impedes the movement of flood waters and distributes them more slowly over floodplains
Counteracts the greatly increased rate and volume of surface-water runoff from pavement and buildings.

Economic benefits of natural services and products at little or no cost

Filtering function saves a great deal of money by reducing the amount of grey infrastructure (stormwater treatment systems) needed to deal with the pollution
Reduces monetary flood damage and related insurance costs, and protects our health and safety
Reduces the likelihood of flood damage to homes, businesses, and crops in agricultural areas lower flood heights.
Reduces erosion downstream & on adjacent lands.
Reduces or prevents water-logging of agricultural lands.

Not all wetlands are protected. Wetland protection is determined by the regulations and definitions of federal, state and local governmental authorities. However, the definition of wetland for regulatory purposes varies among governmental agencies. **In Victor, both federal and state wetland definitions and guidelines for delineation are used.**

Wetland Definitions:

Victor Code §171-5B

All lands and waters in the Town of Victor that fall within the definition of "freshwater wetlands" in the New York State Environmental Conservation Law, as in effect on the date of the enactment of this Article, without respect to whether such lands and waters have been mapped by the Department of Environmental Conservation, and without respect to size, except that such lands and waters must have a contiguous area of at least seven thousand (7,000) square feet or fall within the definition of "wetlands" or "navigable waters" promulgated by the EPA or the United States Army Corps of Engineers pursuant to the Federal Clean Water Act.

New York State Department of Environmental Conservation (NYSDEC)

http://www.dec.ny.gov/lands/4937.html

The NYS Freshwater Wetlands Act identifies wetlands on the basis of vegetation because certain types of plants out-compete others when they are in wet soils, and are good indicators of wet conditions over time. These characteristic plants include wetland trees and shrubs, such as willows and alders; emergent plants such as cattails and sedges; aquatic plants, such as water lily; and bog mat vegetation, such as sphagnum moss.

To be protected, a wetland must be at least 12.4 acres (5 hectares or larger). Wetlands smaller than this may be protected if they are considered of unusual local importance. Every wetland has a 100-foot buffer zone that is also regulated to provide protection for the wetland.

United States Army Corps of Engineers (USACE)

http://www.usace.army.mil/missions/civilworks/regulatoryprogramandpermits.aspx

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. To be classified as a USACE wetland, the area must meet the following three criteria:

- Hydrology – Water must be covering the soil during all or part of the year.
- Hydric – Hydric soils must, under the DEC's jurisdiction, be present. These soils develop under conditions of submergence and low oxygen.
- Hydrophytes – A minimum of 50% wetland-adapted plants must be present during part of the year.

Vernal Pools

Vernal pools are temporary bodies of water that flood each year for a few months during the spring and summer. They are generally isolated wetlands ranging from several square feet to several acres. Spring vernal pools, fill up with melting snow and early rains, and usually dry up by mid to late summer. Some relatively deep pools may remain flooded for a few years but become completely dry in seasons with very low rainfall. Autumnal vernal pools fill during the fall with rising groundwater.



Photo 2.12 Vernal Pool (Photographer: Larry Fisher)

Vernal pools can be found in a variety of sites, such as isolated depressions in the forests, kettle holes, floodplains, gravel pits and large wetlands. Due to the fact that vernal pools are not permanently flooded, they do not support fish populations and thus provide safe breeding sites for several amphibians, including wood frogs, spotted salamanders, and fairy shrimp. These species have evolved life cycles that depend on temporary pools. Suitable pools must have enough leaf litter and other debris to provide food sources and cover for the species that breed in them.

The most valuable vernal pools are ecologically significant due to their size, the length of time they hold water, the presence of State-listed endangered/threatened species or vernal pool species, and their surroundings of intact critical habitat. The vernal pool depicted in Photo 2.12 is teeming with life in the spring. It gradually dries out over the summer. Pools like this are extremely important to Victor's ecosystems.

Vernal pools in the Town of Victor were identified as part of Co-occurrence areas (see Volume 2, Section 13). Specifically, the following Co-occurrence areas were identified to be associated with a vernal pool as part of the wetland composition:

IC-4-FS	WB-1-FS
IC-6-FS	WB-3-FS
IC-13-FS	GB-1-FS
GC-1-RS	FC-1-FS

Overall, a good place to begin when looking for wetland presence on a site is the US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map of the region. NWI mapping helps to identify possible locations of wetlands but should not be used exclusively to determine the locations and boundaries of wetlands. The National Wetland Inventory indicates approximately 816 acres of wetlands in Victor, some of which are also DEC wetlands (approximately 389 acres).

Wetland Sensitivity

Invasive Species: Phragmites is a common invasive plant in wetlands. Some Phagmites or reed (Phragmites australis) species are native, but these are quite rare and scattered. Photo 2.13 shows the dome shaped, dense masses formed when invasive or exotic Phragmites species are present. Growth begins in wet areas and can consume shallow ponds in a few years. Invasive species such as Phragmites clog waterways and shade out native aquatic or marsh plants. Phragmites may actually decrease the extent of wetlands by invading new wetlands created to mitigate previous losses. Extermination is very difficult once invasive Phragmites takes root.



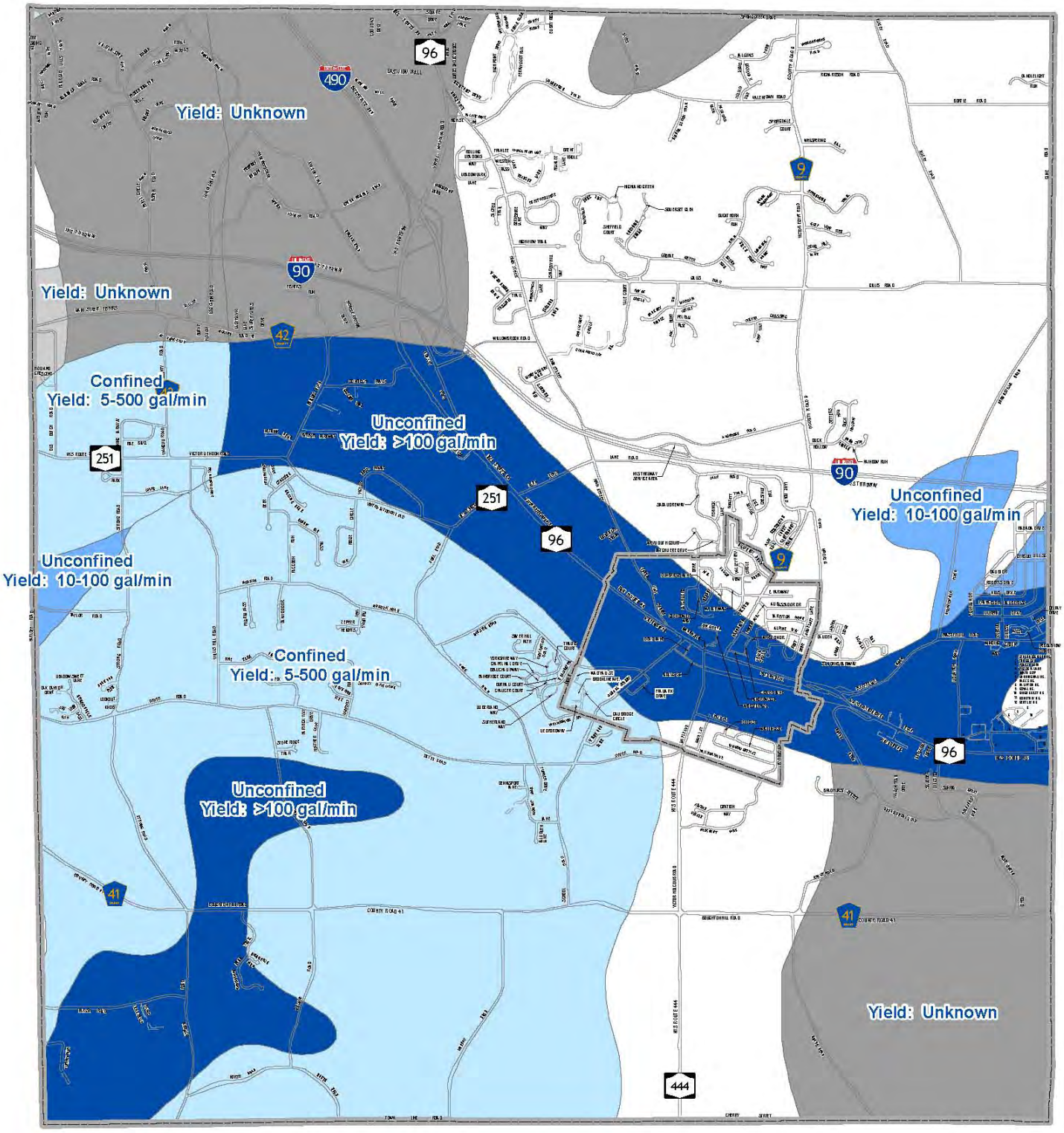
Photo 2.13 Phragmites (Photographer: Larry Fisher)

Vernal pools: vernal pools are small, hard to identify, and subject to limited regulation, therefore they are often impacted by development. NY state regulations do not protect them due to size restraints. USACE usually does not protect them because they are classified as isolated. The Town of Victor Code does not have specific language to protect vernal pools. As a result, vernal pools and the species that depend on them are rapidly disappearing. A revision of the Code to protect such areas should be considered by the Town.

Many vernal pool amphibians go back to breed in the pools where they were born. If the pool is disturbed or destroyed by development, the amphibians show little tendency to relocate. It is also important to remember that these animals rely on both vernal pools and connecting upland terrestrial habitats for survival, spending about 11 out of 12 months each year in adjacent uplands, forests and wetlands. Even development of 25 percent of the surrounding critical terrestrial habitat can negatively impact vernal pool wildlife. For example, one study done in Massachusetts found that when 25 acres of upland forest next to a vernal pool was cleared, the pool's wood frog population became locally extinct, despite a 150 foot wide forested buffer around the pool and a forested wetland corridor adjacent to the pool.

2.6 FURTHER INFORMATION

Further details on delineation, identification and classification of DEC wetlands may be found in Article 24, Freshwater Wetlands Title 23 of Article 71 of the Environmental Conservation Law. http://www.dec.ny.gov/docs/wildlife_pdf/wetart24a.pdf



Map 2.14 - Aquifers

Unconsolidated Aquifers

- Unconfined, High Yield
- Unconfined, Mid Yield
- Confined, No Overlying Surfical Aquifer
- Kame, Kame Terrace, Kame Moraine, Outwash or Alluvium
- Lacustrine or Eolian

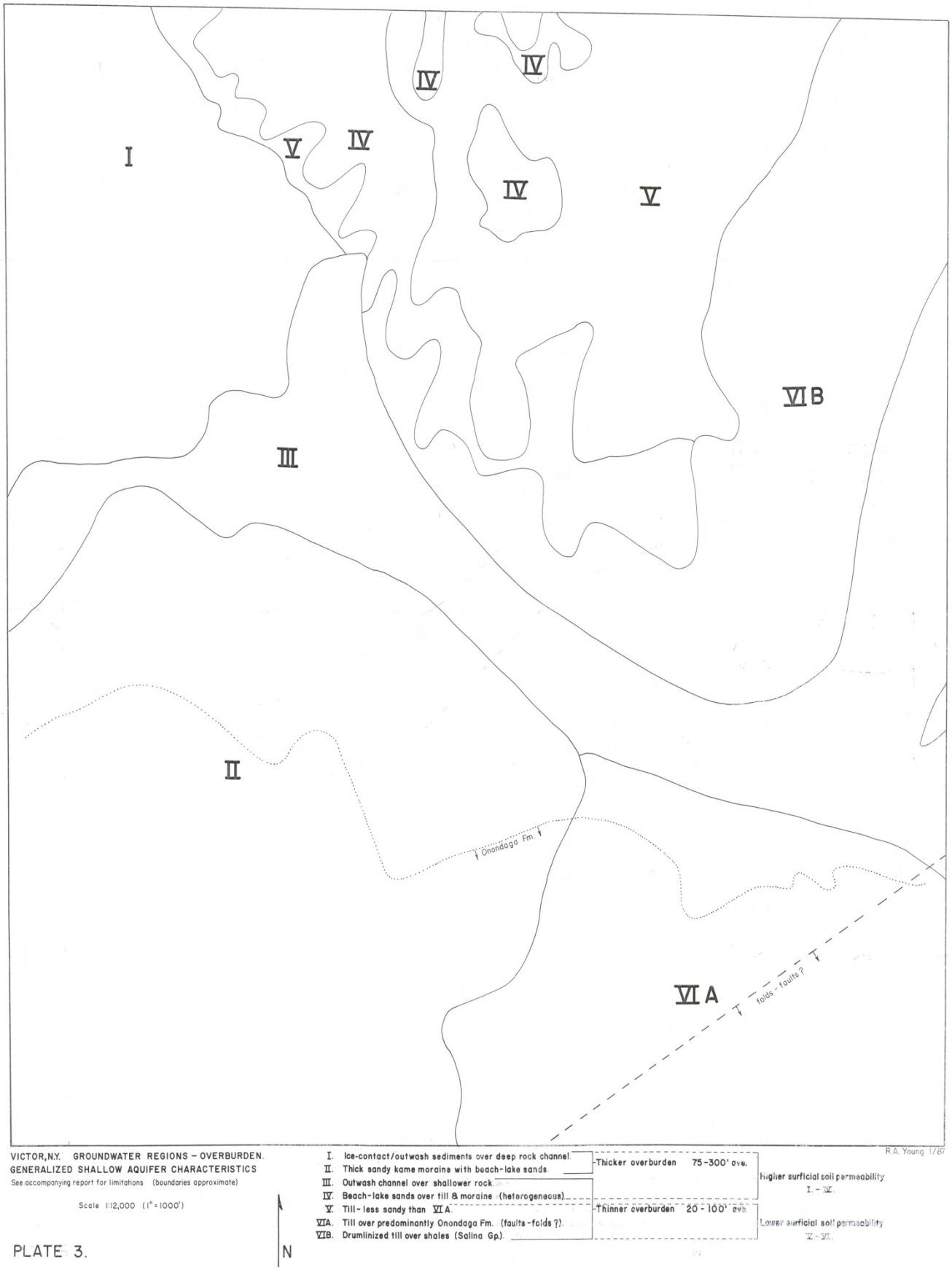
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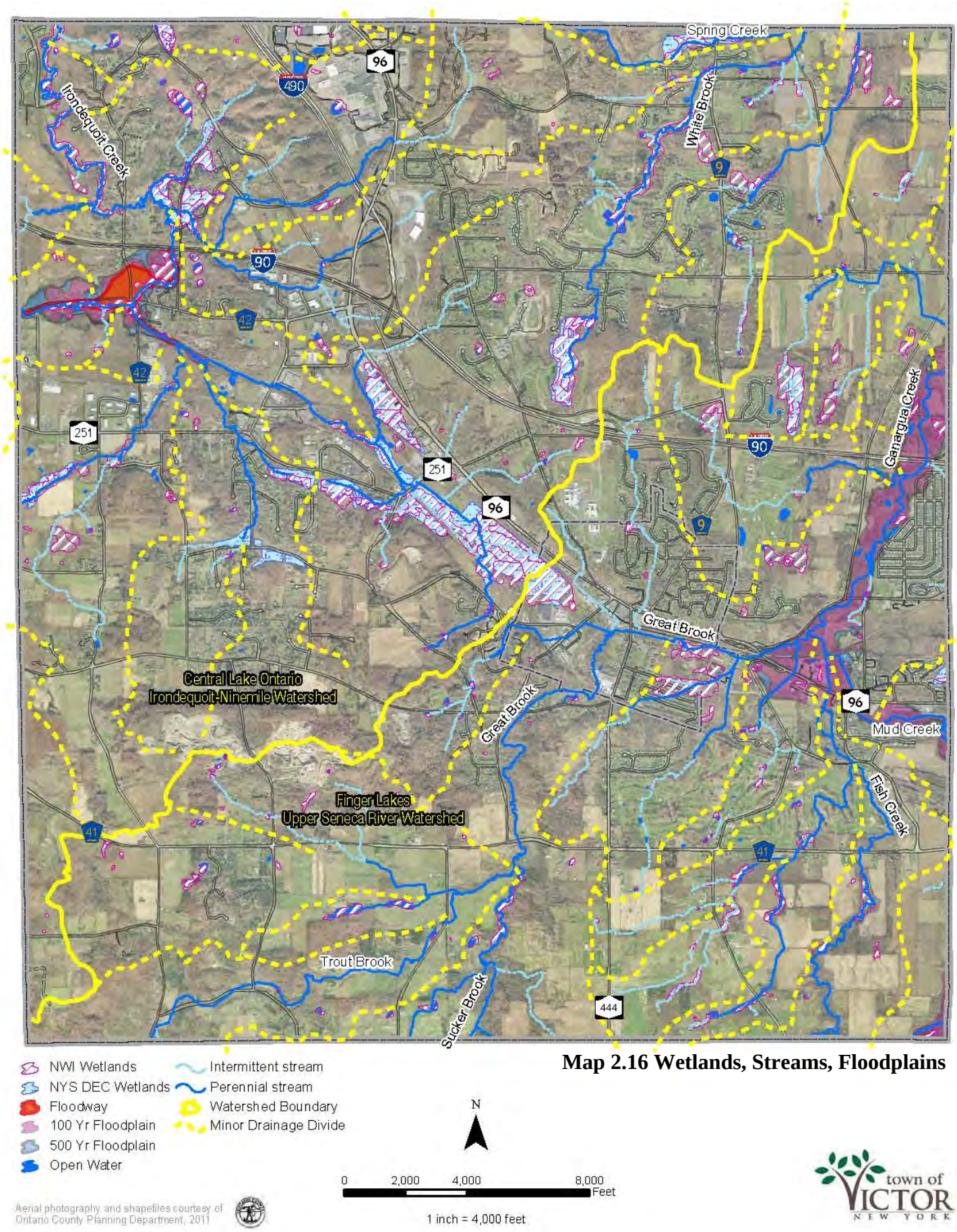
1 inch = 4,000 feet

Aerial photography and shapefiles courtesy of Ontario County Planning Department, 2011

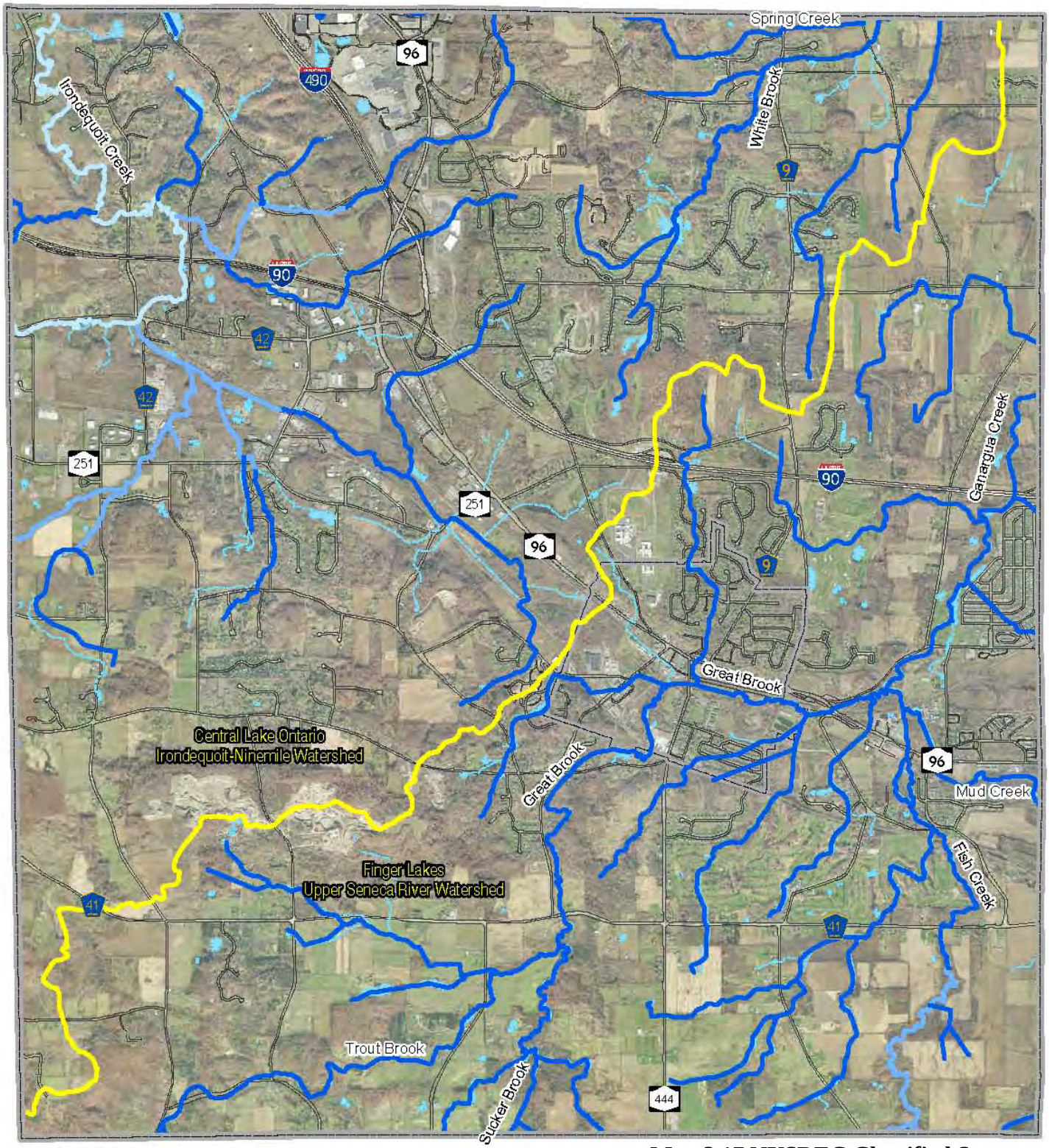
town of VICTOR NEW YORK



Map 2.15 Richard Young's Permeability Analysis



Map 2.16 Wetlands, Streams, Floodplains



Map 2.17 NYSDEC Classified Streams



3. VICTOR'S SOILS

Soil is the loose surface of the earth that is distinguished from the underlying solid bedrock. Soil originates from the breakdown of solid rock and from the decay of organic material. Many soils contain nutrients that will support the growth of plants and vegetation.

The four major components of soil include mineral matter, organic matter, air, and water. Air and water occupy the pore spaces between the soil particles. Organic matter generally improves the aeration of soils, increases the water-holding capacity of the soil, and contributes to aggregate stability by supplying food for microorganisms whose function it is to produce chemicals that hold the soil particles together. Human activity is often related to, and influenced by, soil conditions. Soil conditions can be evaluated for and can impact the development of homes, roads, sewage disposal areas, airports, parks, farms, forests, and commercial areas.

Soils have been mapped for most of the United States, and the Natural Resources Conservation Service (NRCS) publishes soil surveys for each county. The NRCS soil surveys provide a wealth of data on the suitability of soils types for a variety of uses, including agriculture, forestry, wildlife habitat, site development, wastewater disposal, and other uses. Several soil considerations throughout the Town of Victor are notable on the Natural Resource Inventory. Specifically, the presence of highly erodible soils, hydric soils, steep slopes, and prime soils influences how the community continues to evolve.

3.1 HIGHLY ERODIBLE SOILS

Erosion is the wearing away of the land surface by rain or irrigation water, wind, ice, or other agents that abrade, detach and remove soil from one point on the earth's surface and deposit it elsewhere, including such processes as glacial movement, gravitational creep and tillage erosion. Erodibility is the degree of a soil's susceptibility to being erodible.

Erosion can become hazardous when it negatively affects human health and the health of other living organisms. Erosion can also negatively impact development through land loss, site specific destruction of buildings or infrastructure, dispersal of pollutants and other impacts.

The highest rates of erosion are generally associated with agricultural land uses and construction sites. Soil disturbance, as a result of cultivation and exposure during the growing season,

contributes to the estimated average soil loss of four-to-five tons per acre on U.S. farmlands. Some agricultural practices also result in stream channel degradation, the shortening of flood recurrence intervals, and contamination of surface waters by sediments containing fertilizers and pesticides.

Impacts of Farmland Soil Erosion

Erosion tends to remove the less dense soil constituents such as organic matter, clays, and silts, which are often the most fertile part of the soil. The impacts to an agricultural operation due to the loss of soil and nutrients include:

- Lower soil fertility levels
- Development of rills and gullies in the field
- Poorer crop yields
- Less water infiltration into the soil
- More soil crusting
- More runoff in the spring and after storms

The loss in productivity caused by erosion has not been so evident in many parts of the U.S., since it has been compensated for over the years by improved crop varieties and increased fertilization. Soils can tolerate a certain amount of erosion without adverse effects on soil quality or long-term productivity, because new soil is constantly formed to replace lost soil. This tolerable level is known as "T" and generally ranges from 3 to 5 tons per acre per year. Goals for reducing soil erosion often use the "T" value as a target, because erosion rates below T should maintain long-term productivity of the soil.

Off-farm impacts occur when the eroded soil is deposited elsewhere, along with the nutrients, pesticides or pathogens that may be attached to the soil. The tolerable "T" value does not take into consideration the off-farm or downstream impacts. Soil erosion has effects such as:

- Eroded soil deposited (sedimentation) in depressions and adjacent field
- Decreased water quality downstream
- Decline of downstream aquatic ecosystems because of sedimentation and the addition of nutrients, pesticides, and bacteria associated with the soil
- Clogged drainage ditches and other costly problems

Wind-related soil erosion can also occur when exposed soils are blown from agricultural fields, which can have effects such as:

- Reduced seedling survival and growth by reducing seed cover
- Increased susceptibility of plants to certain types of stress
- Transmission of plant pathogens
- Reduced crop yields
- Air quality impacts (dust, particulates)
- Obscured visibility on roadways, which can cause automobile accidents

- Clogged machinery
- Deposits in road ditches, where it can impact water quality

Soil Erosion Considerations in Victor

The majority of Victor's highly erodible soils are found in the southwest region of the Town (see Map 3.4). There are concentrations of highly erodible soils in the northern portion of the Town as well. The strong correlation between highly erodible soils and steep slope areas is evident when comparing Map 3.4 showing Erodible Soils, with Map 1.13 showing Steep Slopes.

Erosion is a sensitive issue in Victor due to its combination of active farming and demand for additional development. Generally, soils cannot be replaced or recreated once they are degraded or removed. Therefore, conservation of soils is an important consideration in the Town.

3.2 HYDRIC SOILS

Frequently flooded and/or waterlogged soils associated with wetlands are called hydric soils. However, any soil covered by water for two weeks or more during the growing season of most years is considered a hydric soil. Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the uppermost soil layer. These soils are developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation.

The presence of hydric soils aids in determining the presence of wetlands and their delineation; however, not all hydric soils indicate the presence of a wetland. Hydric soils can also be important for both agricultural and non-agricultural purposes such as land-use planning, conservation planning, watershed planning, and assessment of wildlife habitat.

Hydric soils can be found throughout the Town of Victor at lower elevations and are commonly located within close proximity to water resources, including wetlands and streams. Map 3.5 indicates the specific locations of hydric soils within the Town.

Characteristics of Hydric Soils

- Primarily consists of decomposed plant material (peat or mucks).
- Thin layer of decomposing plant material on the surface.
- Bluish-gray or gray color below surface, or soil color is primarily dark and dull.
- Odor of rotten eggs.
- Consists of sand with layer of decomposing plant material at the soil surface.
- Consists of sand and has dark stains or dark streaks of organic material in the upper layer.

3.3 AGRICULTURAL SOILS

There are three farmland categories included in the Important Farmland Soil classification—Prime Farmland, Unique Farmland, and Farmland of Statewide Importance. Approximately 56% of soils in the Town (including the Village of Victor) have a Prime farmland classification or are soils of Statewide Importance.



Photo 3.1 Farmland in Victor (Photographer: Donna Clements)

Prime Farmland

Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding. These lands have the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed according to acceptable farming methods.

The majority of Prime Farmland in Victor appears to be in areas north of State Routes 96 and 251, and west of State Route 444. There is Prime Farmland locations scattered throughout the southwestern portion of town, as shown on the Agricultural Resources/Soils Classification Map in NRI Volume 2, Section 16.

Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods. Examples of such crops in the local area would be fruit and vegetables.

Farmland of Statewide Importance

Farmland of Statewide Importance is land (other than Prime or Unique Farmland) that is of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. Generally, Farmlands of Statewide Importance include lands/soils that are nearly Prime Farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as Prime Farmlands if conditions are favorable. In some states, Farmlands of Statewide Importance may include tracts of land that have been designated for agriculture by state law.

Within the Town of Victor, the areas adjacent to County Road 41 (Boughton Hill Road) and Dryer Road have soils with the Statewide Importance classification. There are also locations of Farmland of Statewide Importance scattered throughout the southwestern portion of town.



Photo 3.2 Farmland (Photographer: Marge Elder)

Active Farmland

Based upon an evaluation of active farmland undertaken in 2010, there are approximately 83 properties that contain active farmland within the Town of Victor. Although the parcels add up to approximately 5,321 acres (8.3 square miles) of the Town, this figure does not account for the portions of numerous parcels that are not considered active farmland. The evaluation included parcels with agricultural property class codes (100's), as well as a visual review of 2009 aerial photography to compare apparent farmland that appeared on rural residences over 10-acres (Class Code 240), abandoned agricultural land (Class Code 321), and residential vacant land over 10-acres (Class Code 322). The Open Space Index in Volume 2, Section 16 provides 2013 information on agricultural properties. Class codes are explained further in Section 3.4 below.

Farmland is readily apparent in the southern and eastern portions of the Town, while only a few locations within the central portion of the Town contain active farmland (see Agricultural Resources Map in NRI Volume 2, Section 16.)

Active Farmland Sensitivity

Active farmland is continually being converted into other uses. This trend is happening at the local and national level, and Victor is no exception. A typical scenario for the conversion of active farmland would be that a farmer reaches retirement age or otherwise goes out of business such that the farm is no longer operational. As a younger generation may not be interested in continuing the farm, and the associated land no longer serves the farm or contributes to income, the land becomes susceptible to purchase and development. Development could take the form of a residential subdivision or the location may be advantageous for commercial development.

Farms are often local businesses, as well as a resource for providing wildlife habitat, scenic open space, and recreation that allow outdoor activities such as hunting and fishing. Development on farmland can lead to increased demand for schools, roads, water, sewer, and other community services. Non-farm development may raise perceived land values, which in turn, can prevent other farm operations from expanding.

Well-managed farmland can help protect water quality and enhance community character while providing significant support to the local economy. Unfortunately, improperly planned or implemented agricultural activities can have significant impacts on water quality. Runoff and sedimentation from farms contribute to increased levels of nutrients that can cause algae growth and oxygen depletion in nearby water bodies. Sediment from eroding fields can also choke public drainage ditches and streams.

3.4 AGRICULTURAL LAND USE CLASSIFICATION

The New York State Department of Real Property Services has defined "Property Type Classification and Ownership Codes" to categorize land uses throughout the State. These classification codes are included in the Assessor's Manual and are meant to be used consistently by municipal assessors in New York State. The Codes are organized into nine categories such as Agricultural (100's), Residential (200's), Vacant Land (300's), Commercial (400's), etc. Important agriculturally-related class codes and their presence within the Town of Victor are described below.

Class Code 105 (Agricultural Vacant Land)

Victor's 2010 Parcel Data indicates a total of 1,222 acres of Agricultural Vacant Land (Productive). This type of land is used as part of an operating farm, does not have living accommodations and cannot be specifically related to any of the other divisions in the agricultural category.

Class Code 112 (Dairy Products)

There are two parcels of land in the Town that have this class code assigned, which accounts for 87 acres. One parcel is in the northern portion of the Town, while the other parcel is in the southern portion of the Town.

Class Code 113 (Cattle, Calves, Hogs)

There is one farm within Class Code 113 in the Town, consisting of 187 acres, located on the south side of County Route 41 (see Photo 3.3 below).



Photo 3.3 County Route 41 Farm (Photographer: Donna Clements)

Class Code 117 (Horse Farms)

A total of five parcels containing 247 acres of land have been classified as horse farms. These farms are located in the eastern portion of the Town, both north and south of Interstate 90.

Class Code 120 (Field Crops)

Field crops are the most prevalent class of farmland within the Town, as a total of 22 parcels account for approximately 2,158 acres (41%) of all farmland.

Class Code 151 (Orchard Crops)

The west side of New York State Route 444 contains a 143-acre parcel that produces apples. This orchard is known as The Apple Farm.

Class Code 170 (Nursery and Greenhouse)

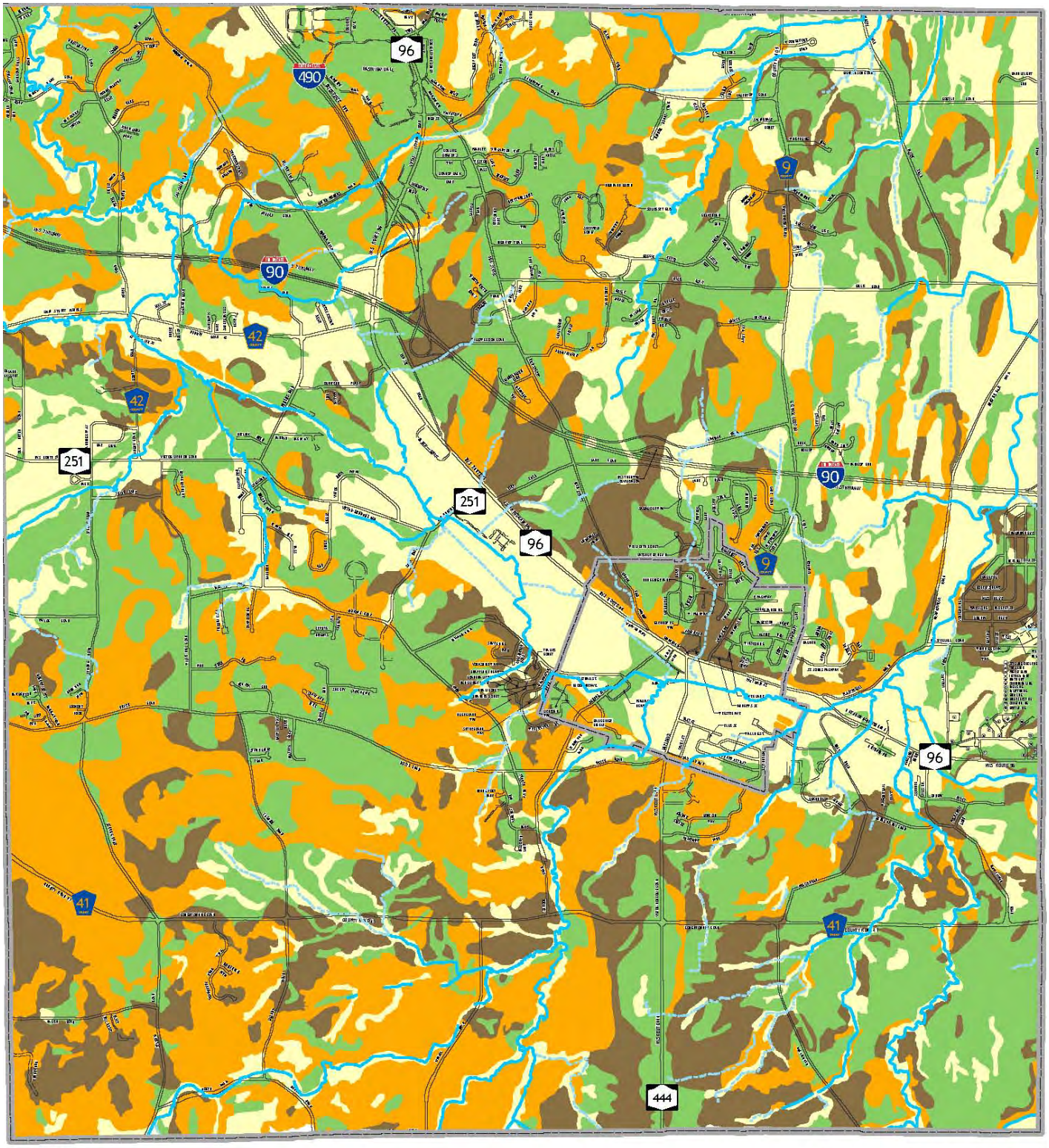
A 57-acre parcel along Murray Road is the only parcel within the Town with the Class Code 170 classification. This is known as the Victor Christmas Tree Farm.

Class Code 240 (Rural Residential with Acreage)

Although Class Code 240 is a residential property classification code, there are instances where these year-round residences with 10 or more acres of land contain land that is farmed. Based upon the 2009 aerial photography, 15 parcels with this classification appeared to have land that was farmed. Presumably, these parcels were productive for field crops. Although there are 982 acres within these 15 parcels, not all of the acreage is dedicated to agriculture.

Class Code 322 (Residential Vacant Land Over 10 Acres)

A total of 5 lots, consisting of 238 acres, account for residential vacant land over 10 acres that also appears to contain some form of active farmland based upon 2009 aerial photography.



ERODIBILITY
- Very High (6,313 Acres)
- High (3,243 Acres)
- Medium (7,744 Acres)
- Low (5,678 Acres)
- Intermittent stream
- Perennial stream

Map 3.4 Erodible Soil

N

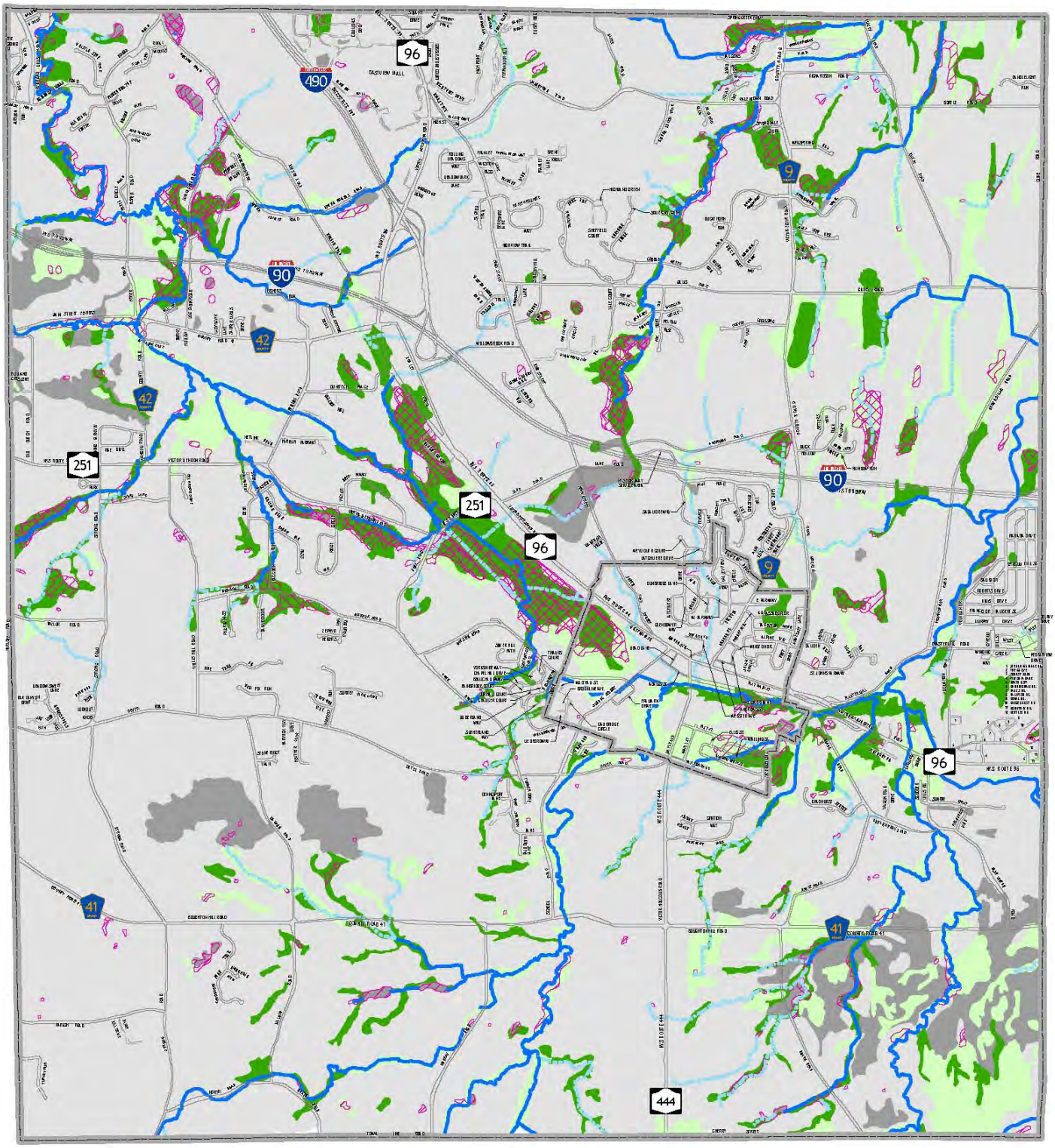
0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

TOWN OF VICTOR NEW YORK

erial photography and shapefiles courtesy of
ntario County Planning Department, 2011

Section 3. Victor's Soils – Town of Victor NRI



Soils

HYDRIC CLASSIFICATION

- Hydric
- Potentially Hydric
- Non-Hydric
- Unknown

- Intermittent stream
- Perennial stream
- NYS DEC Wetlands
- NWI Wetlands

Map 3.5 Hydric Soils

N

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

Aerial photography and shapefiles courtesy of Ontario County Planning Department, 2011

town of VICTOR NEW YORK



4. VICTOR'S PLANTSCAPE

According to journals and archeological studies, the area identified as Western NY—including what is now known as Victor—was a vast forested wilderness prior to the influx of European settlers in 1788. The forest has undergone a significant transformation over the last 350 years, beginning with settlement of the first New England colonies in the 1600's and of Western New York following the 1788 Phelps-Gorham Purchase. Early European colonists cleared land to make room for settlements by extensive logging and catastrophic fires. Once the land was cleared, fire suppression followed. European settlers introduced exotic insects and disease from the Old World not yet seen before in North America which led to rapid changes in forest structure and composition.

Analyses of pre-settlement land surveys conducted in 1788 suggest the forest was comprised of approximately 32% beech (Fagus grandifolia), 18% sugar maple (Acer saccharum), 12% basswood (Tilia americana) and 11% white oak (Quercus alba). Native residents cleared forests to build villages and gather firewood for fuel. They utilized small brush fires to clear land for agriculture, predominantly corn, and cleared underbrush in forests in order to help foraging for game.

The current state of forest and plant life in the Town of Victor is described below.

> The eastern United States has seen the extirpation of the once dominant chestnut tree (Castanea dentata) from the overstory due to the Chestnut blight, the loss of vast white pine forests (Pinus strobus) due to logging and subsequent fires, the virtual cessation of oak regeneration due to fire suppression and intensive deer browsing, and a rapid increase in invasive species.

4.1 PLANT COMMUNITIES

Plant communities are vital components within Victor's landscape, are crucial to ecosystems, and provide diverse habitat within the natural environment. Vegetation cleans the air and water, helps prevent erosion, and reduces greenhouse gases by absorbing and storing carbon. Plants also

provide food, water and shelter for humans and other organisms. Vegetation can supply nutrients and medicines that keep people healthy as well as materials to build homes.

Plant communities are influenced by climate, soils, terrain, water availability and disturbances such as storms, wind, floods, fires and human intervention. Wildlife that live in our landscape also shape the vegetation. Deer often eat much of the forest understory. Beaver create their own habitats by felling trees and brush for building supplies and food, damming streams and flooding the environs. Invasive insects decimate particular species of vegetation in search of food. Invasive or non-native plants, with no natural predators, crowd out and smother native plant communities.

Detailed information regarding Victor's plantscape can be found in NRI Volume 2, Section 14/ Wildlife Habitat Inventory. Based on a 2013 inventory, this section contains a wealth of information regarding characteristic species of a range of habitat types specifically found in the Town of Victor, including Forests, Meadowland, Shrubland, Wetlands, Farmlands, and Open Water habitats. The remainder of this section includes a brief description of forestland vegetation.

4.2 FORESTLAND

Forests help manage climate, enrich the soil, purify the air, aid in regulating the water cycle, and provide wildlife habitats for life to flourish. Forests provide nutrients for a healthy ecosystem.



Photo 4.1 Forest Trail (Photographer: Larry Fisher)

Nutrients within soil can be absorbed by tree roots and promote leaf or needle growth. When leaves and needles fall, they will decay and become an organic component of soil. The organic components of the soil help absorb water and release it slowly. This allows a more steady supply of water for plant growth and can reduce erosion and flooding.

Based on recent land cover mapping, as documented in the Open Space Index (see NRI Volume 2, Section 16), there are 5,698 acres of forested uplands and 773 acres of forested wetlands/ peatlands in the Town of Victor. This equals a total of 6,471 acres, or roughly 10 square miles, of forested land in the Town.

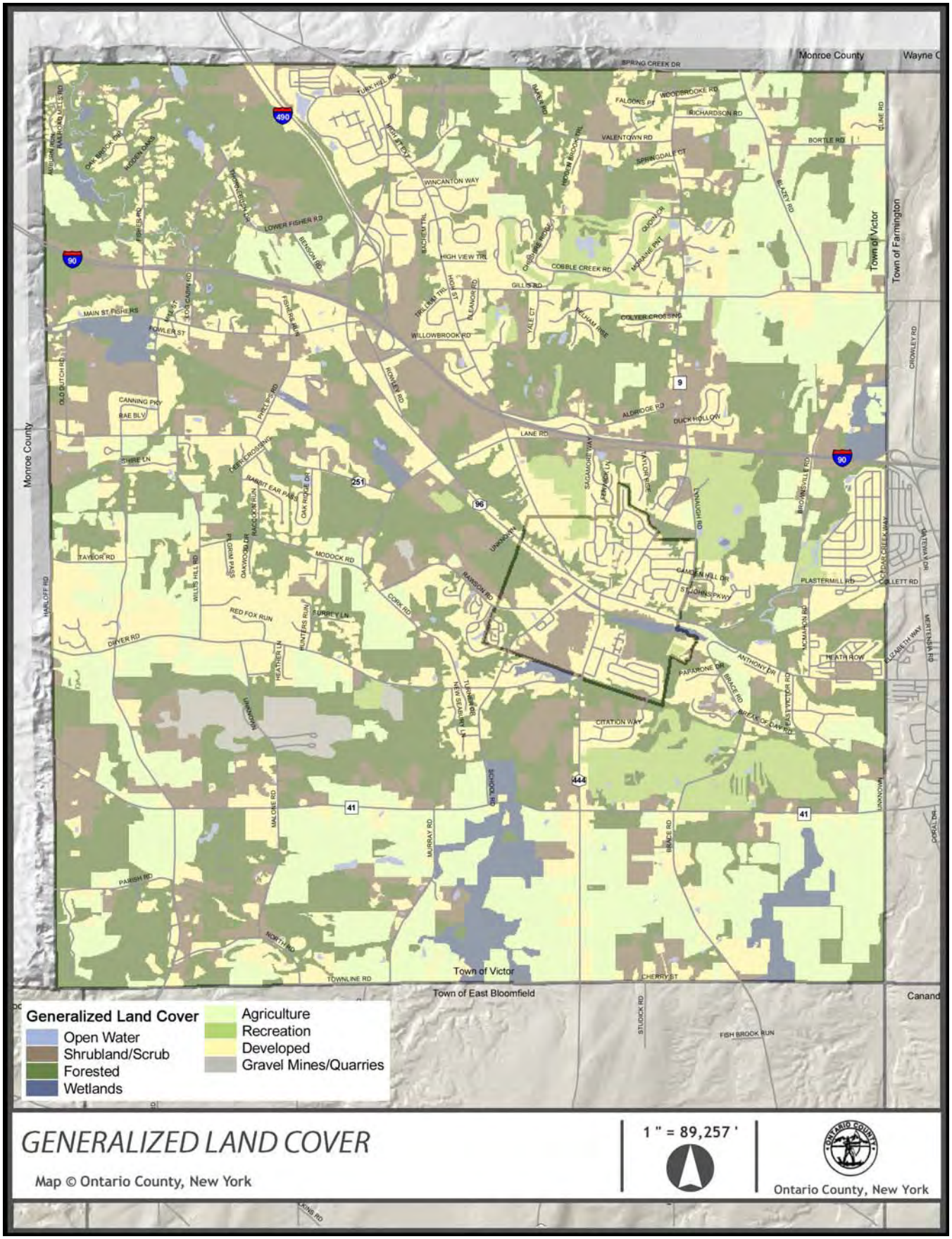
Forest edge habitat is found along the boundary of wooded land and represents the meeting of two different plant communities. Some species are particularly adapted to edge habitats and take advantage of the diverse vegetation for food and cover. However, other species are more adapted to interior forest habitat as they require large tracts of contiguous forest and typically avoid edge habitats. Many populations of forest interior birds are declining due to fragmentation of forested habitats into smaller patches, which increases the amount of edge and the associated effects of predation and nest parasitism. Wildlife species adapted to edge conditions readily outcompete forest interior species for resources along forest margins. More information on edge habitat is provided in Section 5/Habitat.

Forest Sensitivity

Many of the forested areas in Victor are found on steep slopes. Sloped terrain can be difficult to farm or develop. Therefore, the trees in these areas have been preserved to a greater extent. The root systems of the trees within steep-sloped areas hold soil in place and stabilize soils, and the presence of trees and forests on sloped terrain is considered important to the environment.

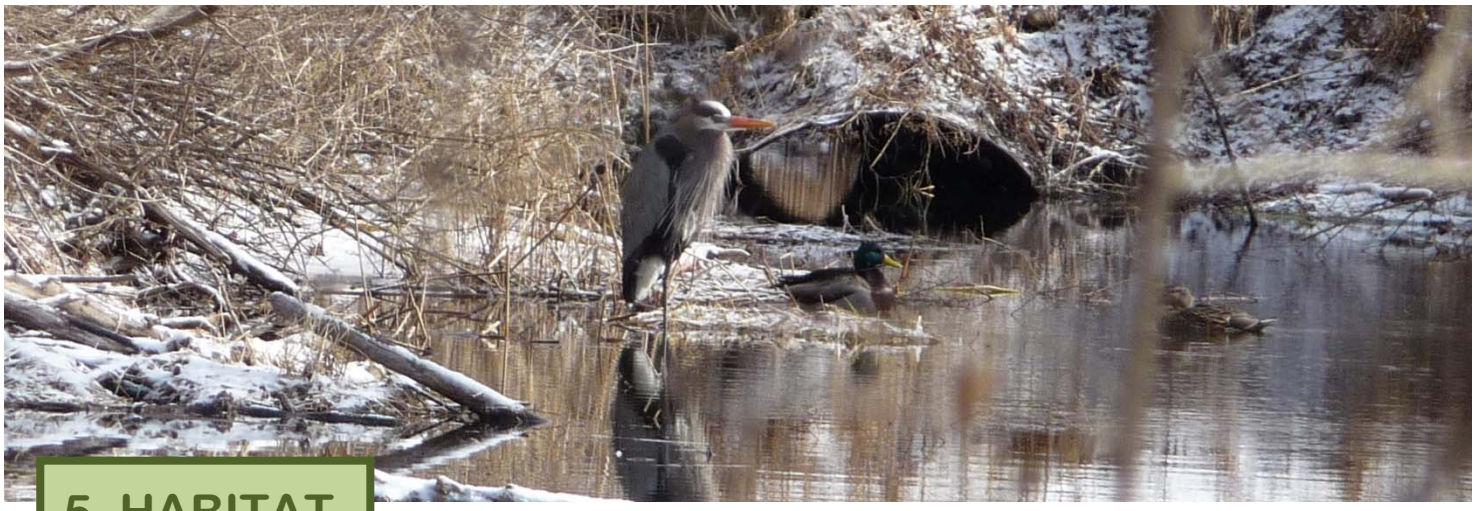
Clear cutting land of forest growth can increase water runoff, erosion, and the likelihood of flooding, as the trees and undergrowth are no longer present to absorb rainwater. Soil nutrients that were held in place and nourished by forest habitat can be washed away through stormwater runoff and erosion. Unsustainable forestry can also lead to the spread of invasive, non-native species that compete for space and food.

Managing forestland will help promote wildlife habitat and the presence of native species. However, wildlife can also be a potential threat to forests. Deer will eat the undergrowth, which makes way for invasive plants to compete for space and nourishment. Deer hunting can be seen as a way to not only manage deer population but also to manage the habitat conditions, particularly within the forest environment.



Map 4.2 Generalized Land Cover

Section 4. Victor's Plantscape – Town of Victor NRI



5. HABITAT

A Wildlife Habitat Identification and Assessment was prepared for the Town of Victor in 2013 by BME Associates, using the New York State Natural Heritage database and Ontario County GIS materials as well as many other resources. The assessment involved substantial field work to more accurately identify wildlife habitats, their boundaries, and to evaluate connectivity of individual habitat areas. Additional, detailed information on wildlife habitat is provided in NRI Volume 2, Section 14.

Section 5.1 explains what is considered to be a healthy habitat in order to support wildlife. An understanding of what environmental conditions wildlife needs to survive and thrive will help the Town during the land planning process to identify and protect important wildlife habitats in the Town of Victor. The habitat selection section explains how certain animal species determine where they live.

Section 5.2 addresses fragmentation of wildlife habitats. The natural environment wildlife needs to survive has been historically reduced. The land has been divided into smaller areas through land conversion to a farmland, residential, commercial and industrial uses. Fragmentation involves separation of habitat areas from previous state of better continuity. This section also explains connectivity of separate wildlife habitats via corridors, and how to protect or improve those important landscape features.

Chapter 5.3 covers "keystone species" - wildlife species who have the largest effect on its environment relative to its abundance, although at any given time almost all species play a certain role in maintaining a balanced habitat. The removal of these species could change the existing ecosystem and its sustainability.

Chapter 5.4 identifies unusual/ significant habitats in the Town of Victor.

5.1 WILDLIFE HABITAT AND HABITAT SELECTION

Wildlife Habitat

A wildlife habitat is defined as an environment in which different wildlife species live. The basic habitat requirements wildlife need to survive are food and water, cover (shelter) to hide from predators and harsh weather, and space to move, escape, rest and reproduce. When all these essential requirements are present, the habitat can support a variety of wildlife species. The sign of a healthy habitat is the presence of thriving diversity of wildlife species (high biodiversity).

Food and water for wildlife must be accessible within their habitat. Food for wildlife can be produced from trees, shrubs, wildflowers, and grasses. Different kinds of nuts such as acorns or walnuts, berries, wildflowers and grass seeds, etc., provide highly nutritional food to many animals. Different birds and mammals will feed on seeds or fruits produced by the vegetation such as the berries on a dogwood or a viburnum shrub species. If the proper diet is not accessible, wildlife may become nutritionally stressed and unhealthy, and decrease in population. A water source within a habitat is essential for wildlife survival. Wildlife will not inhabit areas too far from water, even if food and cover are abundant. Some amphibians (salamander and frog species, etc.) live very close to, if not within, a water source to survive. Examples of water sources include wetlands, vernal pools, streams, lakes, etc. Larger mammals can roam longer distances to find water.



Photo 5.1 Wildlife Habitat (Photographer: Larry Fisher)

Cover or shelter for wildlife to hide from predators and weather is also essential to their survival. Cover usually includes vegetation to hide behind and to create obstruction between the animal and a potential predator. Woodlots, brushland, overgrown meadows, brush piles, etc., can provide animals the security that they need from predators, especially when they feed their young. Many animals are dependent on the particular habitat they need to survive. On the other hand, some wildlife species are not very selective about their cover such as opossums, which can live in almost any type of habitat, including towns and cities.

Wildlife species also require a certain amount of space to move about, avoid or escape potential predators, locate a mate, obtain sufficient food and water for survival, and rest. Other factors affecting space needs of wildlife include; how large the animal is (larger animals require more space), the animal's dietary preferences (carnivores generally require more space than herbivores), and how well the animal can withstand crowded conditions. Forest interior bird species are examples of species which require a larger area of wooded habitat of a certain depth from its edge. For example, the Ovenbird, Scarlet Tanager and Eastern Wood Peewee are species which require extensive area of woods. These species of birds become more abundant in forests with about 70% canopy cover and size of 200 acres or more.

Habitat Selection

Habitat Selection can be seen as a hierarchical process in which animals determine where they should live by making genetic and physiological decisions. Within a habitat community, the hierarchical process includes three (3) types of features. These features can be described as: general, structural and specific.

General features of a habitat include sources of water and cover. For example, the presence of streams, ponds, lakes, and wetlands would provide a water source and perhaps some cover (amphibians and reptiles). Open grassland, shrubby areas, and forests provide different types of shelter and areas to roam.

Structural features within a specific habitat would include cover, but also food and behavioral opportunities for different wildlife species. Some examples of structural features are branch perches on a tree for birds, saplings of trees and low branches for deer to forage, openings in shrubby areas to give sufficient room for a bird to take flight, dead trees with splitting bark for bat cover, hollow old trees for bird to nest and mammals to hide.

Specific features of why an organism (animal, plant, fungi) chooses a place to live can be defined as abiotic and biotic factors. Abiotic factors of habitat selection are non-biological such as temperature, humidity, pH and salinity. Biotic factors would include competition, predation, and disease.

For example, bird species have shown a dominant relation between structural features of vegetation and the species living there. They assess the type of terrain / lakes, ponds, streams, wetlands, open grassland, shrubby areas, types and size of forests and the distribution of vegetation (patchy vs. full). Once in their general area, they will try to assess more structural

features of the habitat such as the density of leaves, openness, patchiness, elevations of limbs on a tree off the ground, etc. They also assess more specific features of an area such as competition and predation once they have lived within it for a certain period of time.

5.2 WILDLIFE HABITAT FRAGMENTATION

Habitat loss is simply defined as any reduction of a habitat's land area. Habitat fragmentation is habitat loss that occurs when a portion of the habitat's land area is removed causing a disconnect from the remaining community by "fragmenting" it into smaller patches. Habitat loss and fragmentation are two primary threats facing wildlife species (reduction in the overall land area available) and can be a driver of lower biodiversity.



Photo 5.2 Habitat Fragmentation (Photographer: Donna Clements)

Habitat fragmentation is a scale-dependant process where up to a certain point, fragmentation results in no loss of species.

When this loss occurs, the structural integrity of the habitats may decline since smaller patches generally contain fewer species (lower biodiversity).

Species that first leave the fragmented area are typically interior species whose habitats begin deeper within the habitat area. Some interior species require large tracts of contiguous habitat to survive, and typically avoid edge habitats which are exposed to predators (for example, edge of woods along meadow, etc.). The removal of a natural community can occur through the conversion of land to farming or development.

Habitat Connectivity (Corridors)

Wildlife corridors are strips of vegetation linking one patch of habitat with another, providing connection between them. Vegetation within the corridors is normally similar to the patches they are connected with, but different from the surrounding landscape where they are located (development, farmed fields, etc). They can be as small as a vegetated hedgerow or drainage tributary, or as large as hundreds of acres of forested area. Corridors interconnecting one habitat patch with another (otherwise separated by human activities or structures) can enhance the integrity and stability of fragmented populations. Functions of corridors include: travel ways for wildlife, protective cover from predators/people, facilitation of better gene flow and acting as a filter for pollutants (farming, runoff, etc.). There are basic corridor types such as natural corridors including wooded, shrub, stream corridors, as well as man-made corridors.

Natural Corridors

Natural corridors can be found throughout the Town of Victor. These corridors could be a strip between two farm fields, or a wooded strip of open space between two residential developments or a stream corridor. Some species will do just fine with relatively narrow corridors, while others that are less used to human presence require larger areas of negotiation.

Stream Corridors

Stream corridors with woody vegetation along river and stream banks are of a particular value because they can provide for safe wildlife traffic, as well as water, food and cover for a large diversity of species. A larger food source for wildlife can be usually found in stream corridors, attracting more wildlife species to these areas. For example, leaf litter from a vegetated stream corridor is fed on by many macro and micro-invertebrates who are a source of food for small fish. Larger fish will inhabit stream and prey on smaller fish, and provide good food source for wildlife species such as raccoon, skunk, fox and coyote. Some other small wildlife species which could be preyed upon in stream corridors are frogs, salamanders, toads, and small mammals.



Photo 5.3 Stream Corridor
(Town of Victor Photograph)

Stream corridors are important as they provide control of erosion which helps to prevent sediment and pollutants to enter the stream habitat. A well-vegetated stream corridor will reinforce the banks of the stream by providing a strong root system. There is also a flood control factor within stream corridors, especially if there are parallel wetlands along the stream.

Man-made Corridors

Man-made corridors in the Town of Victor include utility corridors and planted hedgerows. Some hedgerows (wind breaks) can be considered man-made as the land surround may have been altered in some way such as through farming or development. The Town of Victor has many man-made corridors which wildlife species use to move from one habitat patch to another:

Utility Corridors
Utility companies maintain the vegetation (mowing, trimming) beneath power lines or over buried utility lines (gas, etc.). The maintenance of these corridors results in a successional habitat (meadow or shrub cover) for long periods of time. This is good for wildlife in many ways, such as creating an open, intermixed structure which can contribute to diversity of the habitat. It provides cover for nesting birds and creates a valuable food source of flowering plants and forbs that occur within the maintained utility corridors. The edges of these corridors are very valuable, especially if the corridor runs through a wooded area.
With the maintenance of these corridors, the spread of invasive species may occur. The more traffic and disturbance within these areas, the more likely they are prone to establishment of invasive species. Some of these utility corridors have non-native or low quality species growing within them. Many successional vegetation are pioneer species which can be fast growers with little nutritional value. The most common of these species can include honeysuckle, common buckthorn, autumn olive and other species.

Hedgerows
Hedgerows act in much the same way as a forest edge does. They provide a good vertical structural diversity, from groundcovers up to trees, which provide a multitude of habitat layers. The more diversity of plants, the more the hedgerow would be utilized by certain species. Having a diversity of plant species and structural layers is important since different species inhabit specific vegetation layers. More layers provide more refuge and more sources of food.

Offsetting Fragmentation to Protect Habitat Connectivity

Changes in land use can degrade a habitat's use and function by removing important portions of it. Many species also typically require more than one habitat to survive such as a forest and wetland which is the case of certain amphibians (refer to NRI Volume 1, Section 6/Co-occurrences for these types of areas in the Town of Victor). A poorly planned project or other kinds of disturbances can block movement between these different forms of habitat. By

considering the natural areas of the site first, development projects can be designed (i.e. clustering) to maintain the functional integrity of existing wildlife habitats.

Protecting areas which serve or could serve as a connection between wildlife habitat areas is important in land use planning. When a property is to be developed, an effort should be made to protect high quality wildlife habitats by avoiding their fragmentation. Existing wildlife corridors should be identified and preserved. In the case of existing fragmented habitat, opportunities should be investigated to provide new connectivity. Hedgerows and other corridors add to biodiversity by offering important wildlife habitat. Wildlife corridors allow animals to move under cover through an open countryside, and can provide food, nesting and roosting opportunities. Placing them in conservation easements is a tool which can be utilized to preserve a functioning corridor.

Planning features such as a vegetated wetland stormwater management pond along an existing corridor can also help improve the function of existing habitat. Ponds can create natural transition from development to existing natural communities and physical barriers (buffers) to limit possible encroachments into these areas. Ponds can also provide a new habitat rich with amphibians, insects, and plants which can attract many birds, waterfowl, mammals, and enhance biodiversity of the area.

5.3 KEYSTONE SPECIES

Keystone species can play a large role in maintaining the structure of a natural community as they have effect on its environment. The ecosystem could dramatically change if its keystone species declined or were removed. Almost all species living in a particular wildlife habitat take a certain role in keeping the habitat balanced.

There are three different types of keystone species: predators, mutualists and engineers. Each type and appropriate example is described below:

> Predators - Keystone predators are a species that prey upon another and keep the population in check. Without predator keystone species, certain wildlife species can explode, driving out other species and reducing wildlife diversity. An example of a predator keystone species could be a fox or coyote within a habitat. These species can keep population of mice and rabbit down. These prey species can destroy vegetative cover habitat and cause decline of other species if not controlled by predation.
>
> Mutualists - Keystone mutualists are organisms that are mutually benefiting from one another. Various species of bees is an example of a keystone mutualist. Bees use pollen and nectar from flowers for food while helping to pollinate them. If the flowering plants were removed, therefore eliminating the source of pollen and nectar, the bees would not survive in the area. Similarly, if the bees were removed, the flowering plants, which are dependent on pollinators (bees), could not reproduce and would decline or be eliminated.

Removal of these species could result in decline, and possible declines or collapse of the ecosystem.

Engineers - Many keystone species could be considered engineers. A beaver is an example of an engineer that is commonly found in our area. A beaver can transform the habitat associated with a stream into a pond or wetland. Beavers use trees, branches, mud, etc., to build dams to create deeper water environment.



Photo 5.4 Evidence of Beaver (Photographer: Kate Crowley)

Beavers cause flooding of large areas and change of existing habitat as they remove trees and alter water elevation. They create wetlands, open water, wetland meadows, etc. This newly created environment may support new species such as amphibians, fish, waterfowl and many song birds.

5.4 UNUSUAL / SIGNIFICANT HABITATS

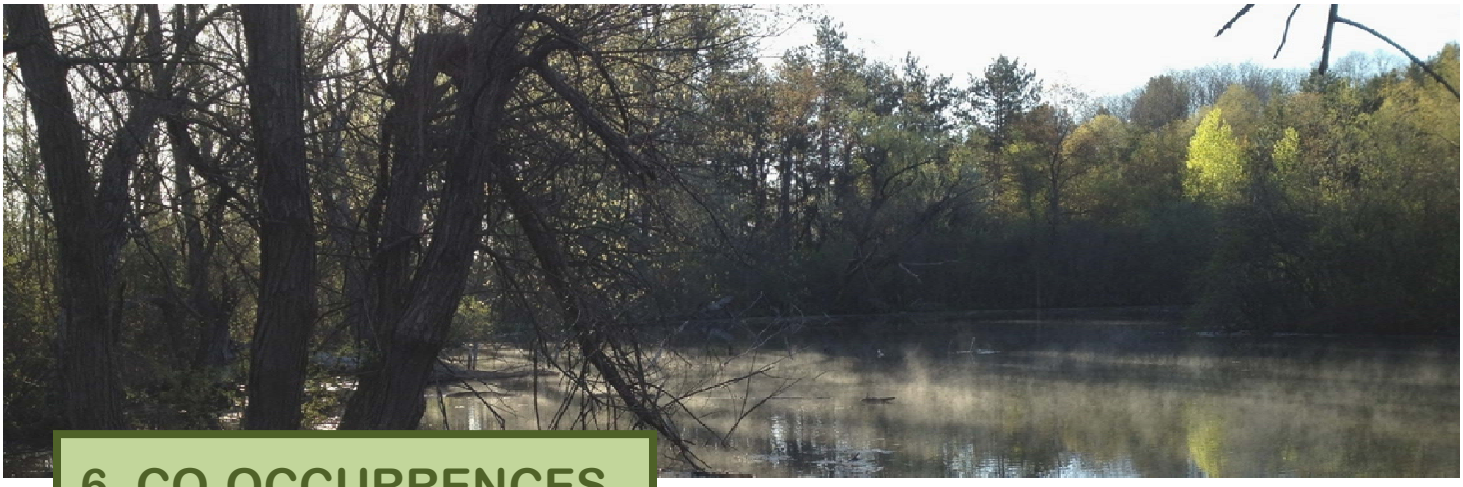


Photo 5.5 Bentley Woods
(Nature Conservancy Photograph)

Significant natural communities serve as habitats for a variety of plants and animals. The environmental characteristics of a habitat include plants, water and soil. Significant habitats can consist of wetlands, forests, grasslands, open water, or a variety of other natural features.

According to the New York State Department of Environmental Conservation, there is one Significant Natural Community in the Town of Victor. This Natural Community,

called Bentley Woods, is protected by The Nature Conservancy. Bentley Woods is a rich shrub fen (classified as a freshwater non-tidal wetland of approximately 5-acres) located on Log Cabin Road, north of the NYS Thruway. A fen is a type of wetland that is mineral-nourished and contains a spongy layer of peat. Fens generally occur on organic substrate and usually have an internal flow of groundwater at the root zone. The water table remains at or near the soil surface for much, if not all, of the growing season. For other unusual habitats, see NRI Volume 2, Section 14.



6. CO-OCCURRENCES

Co-occurrences of natural resources are areas in which two or more different valuable and/or sensitive environmental resources are present. These resources include wetlands, woods, steep slopes, streams and floodplains. Each resource can be described by its specific physical conditions, characteristics, and qualities. For example, a high quality wetland with an abundance of diversified wetland vegetation and wildlife, also serving as a floodwater storage area, is a co-occurrence.

Co-occurrences of several resources can create complex ecosystems that may become impaired if one part is irretrievably disturbed. A simple example: a wooded steep slope is disturbed and erodes adjacent to a stream or wetland, the effect is not only to the steep slope but also to the waterbody, as silt could affect plant and animal life and degrade water quality. A more complex example is illustrated by a high quality stream with a wooded stream corridor. Removal of the woods that shades the stream surface creates temperature loading referred to as thermal pollution. As water temperatures rise, the oxygen the water holds for respiring stream inhabitants (trout, other fish and aquatic insects) is reduced and the aquatic habitat can be impaired or lost. In addition, the affected woodlands are important in providing habitat for certain aquatic insects upon which trout feed. Removing the woods could therefore cause a reduction of the insects, increase the water temperature, reduce the oxygen and stress the trout population (at least in that section of the stream).

Co-occurrence areas can also have a high aesthetic appeal which enhances community character and provide balance to developed land forms such as residential, commercial and farmed lands. Protection of these natural resources provide multiple benefits including (but not limited to) improving water and air quality, reducing or preventing downstream flooding, and providing recreational resources for hunting, fishing, wildlife watching, bird watching, hiking, boating, and more.

6.1 CO-OCCURRENCE ANALYSIS

An analysis of co-occurrences was completed for the Town of Victor in 2012 by BME Associates (see complete report at http://www.victorny.org/DocumentCenter/View/280). The analysis provides an inventory of co-occurrence areas larger than 10-acres in size and establishes a consistent means to inventory resources on other properties. The inventory was prepared based on an initial desktop assessment using maps, on-line information and other documentation to show general areas of co-occurrences within the Town. Roadside surveys were conducted to validate the map assessment findings and to explore other potential co-occurrence areas. Co-occurrence areas were then field-surveyed (if possible) and a consistent set of field data assessment forms were filled out for each property.

Each identified co-occurrence included at least two natural resources: Wetlands, Woods, Steep Slopes, Streams, and Floodplains. Rankings were defined for each of these resources in terms of the quality of the resource, and a numeric value was assigned to each ranking. The resource description, ranking and numeric values are found in Volume 2, Section 13 of the NRI.



Photo 6.1 Co-occurrence (Photographer: Larry Fisher)

The co-occurrences are organized by watershed. There are two major watersheds in the Town of Victor which each contain several subwatersheds:

1. Central Lake Ontario Irondequoit-Nine Mile Watershed *(northwest portion of Victor)*
   - Irondequoit Creek (IC) subwatershed
   - White Brook (WB) subwatershed

2. Finger Lakes Upper Seneca River Watershed *(southeast portion of Victor)*
   - Ganargua Creek (GC) subwatershed
   - Great Brook (GB) subwatershed
   - Sucker Brook (SB) subwatershed
   - Fish Creek (FC) subwatershed

Map 2.17 illustrates the general location of the watersheds and streams listed above. More information about these individual watersheds and subwatersheds is provided in Volume 1, Section 2.2/Watersheds and Streams and in Volume 2, Section13.

The Co-occurrence report in NRI Volume 2, Section 13 includes a summary of the co-occurrences which were inventoried and ranked as part of the co-occurrence analysis.



7. VICTOR'S OPEN SPACE

NYSDEC defines open space as land that is not intensively developed for residential, commercial, industrial or institutional use. It includes agricultural and forest land, undeveloped coastal and estuarine lands, undeveloped scenic lands, public parks and preserves. It also includes water bodies such as lakes and bays. Open space can be publicly or privately owned.

Open space protects the environment in many ways. Forest and meadow buffers around ponds and streams reduce degradation of watersheds by minimizing pollution, absorbing run-off and securing habitat for wetland plants and animals. Healthy watersheds and wetlands reduce flooding and preserve water quality. As such, open space buffers are important to both the immediate environment as well as the surrounding communities.

Open space is critical to maintaining biodiversity. Large forest tracts, for example, increase the survival of woodland songbirds. Victor's woodlands shelter many vernal pools where amphibians breed in early spring, species that are losing ground in much of their territory due to changing land use. Forest and contiguous open corridors allow for the daily and seasonal movements of wildlife.

Historically, open space within the Town was susceptible to development. Residential development continues to be an ongoing pressure in Victor, as does commercial development. Without protection mechanisms in place to preserve open space, or the specific environmental characteristics that contribute to open space, development pressure could potentially drain the Town's open space resources. It is important to note that although open space protection is often based on sensitive environmental features, not all open space is environmentally sensitive.



Photo 7.1 Open Space Meadow
(Photographer: Marge Elder)

7.1 HISTORICAL CONTEXT

For the past 40 years, Town residents have challenged the Victor Town government to protect the rural character and environmentally sensitive areas of Victor. In 1970 the Town Board established a Conservation Advisory Committee. By state law, this council advises in the development, management, and protection of the Town's natural resources. In 1974 the Committee became an official Town Advisory Board by completing an Open Space Index, as mandated by NYS General Municipal Law. The Index included an Open Space Rationale and a map highlighting sensitive areas in the town (see Appendix F). Their work has provided the foundation on which all future discussions of open space have been based.

> OPEN SPACE in the TOWN of VICTOR (1974)
>
> *Open Space Rationale*, published 1974 (See Appendix F)
>
> In pointing out the increasing citizen concern for maintaining open space in the Town of Victor, Ontario County, the following study discusses the recreational values (social), economic advantages and the important conservation needs that such areas fulfill.
>
> At the present time, Victor has considerable open space. Most of it is in private hands, however, and unless careful selective governmental planning is exercised to guide and assure that a portion of this current open space is preserved, there will be little left to utilize when needs and public demands become greater.
>
> Traditional estimates as to how much open space a community requires are now thought to be inadequate in a society where recreation and the need for peaceful and quiet places to go are becoming increasingly important. Victor needs to insure a quality of life in the community by making the best use of its lands, providing recreation opportunities not only in the form of playgrounds, but also convenient natural areas for all ages.

In the 1990's, in the face of intense development pressure, an Open Space Plan was developed and included in the 1995 Town of Victor Comprehensive Plan. The goal of the open space plan was stated as: "to identify and protect an interconnected network of natural lands….The open space plan should hope to preserve and enhance the quality of life in the Town of Victor." The Open Space Plan was amended in 2002 with the addition of several tools to protect open space, including Residential Overlay Districts, Conservation Easements, and a Purchase of Development Rights program. The definition of open space was later broadened to include agricultural lands.

Current open space policies can be found in the Town's Comprehensive Plan and Town Code The Open Space definition now included in the code reads as follows:

> An area retaining vegetative cover. An 'open space' area may be left in its natural state, landscaped or used for outdoor recreational facilities such as golf courses, playfields or picnic areas.

In May 2012 the Conservation Board developed an alternative definition that was proposed for inclusion in the Comprehensive Plan and eventual incorporation in the Town Code. This definition reads as follows:

> Open Space: Undeveloped land which consists of natural features and topography (including ponds and streams, rocky areas, and vegetated areas, etc.) that may include Natural Resources, Landscaping, re-vegetated areas (such as agriculture and meadows) and pervious or open water areas within Recreational facilities. Open Space shall not include impervious areas such as parking lots, paved sidewalks or buildings.

7.2 OPEN SPACE INDEX

An Open Space Index was prepared for the Town of Victor in the summer of 2013. The purpose of the Victor Open Space Index is to identify, describe and map the Open Space in the Town, consisting of significant agricultural, natural and cultural resources, and to determine the extent of various types of Open Space, both townwide and in individual parcels.

The Open Space Index in NRI Volume 2, Section 16 is comprised of a series of maps, including an interactive map that contains open space data by parcel (> 5 acres). The Open Space Index is a tool intended to be used by the Conservation Board and other Town entities to identify the land cover types and protected/ regulated land throughout the Town and to document the resources included in each individual parcel. This tool is designed to facilitate the evaluation of parcels that may be proposed for development, acquisition or preservation.

The Open Space Index also sets a useful benchmark for the total amount of open space in the Town of Victor. Changes in open space can be measured from this benchmark amount on a regular basis (eg. every five years). **In October 2013, the Open Space Index indicates that 15,743 acres, or 71% of the Town, is classified as Open Space.** The Open Space Index is included in its entirety in Volume 2, Section 16.

7.3 PARKLANDS

Victor residents are able to interact with and enjoy natural resources and wildlife in well-developed and well-maintained Parks within the Town thanks to the efforts of the Town Parks and Recreation Department http://www.victorny.org/index.aspx?nid=111. Their mission echoes the desire of town residents: to provide a balanced system of park lands, preservation of open spaces, and broad-based leisure opportunities that will foster growth of healthy lifestyles.



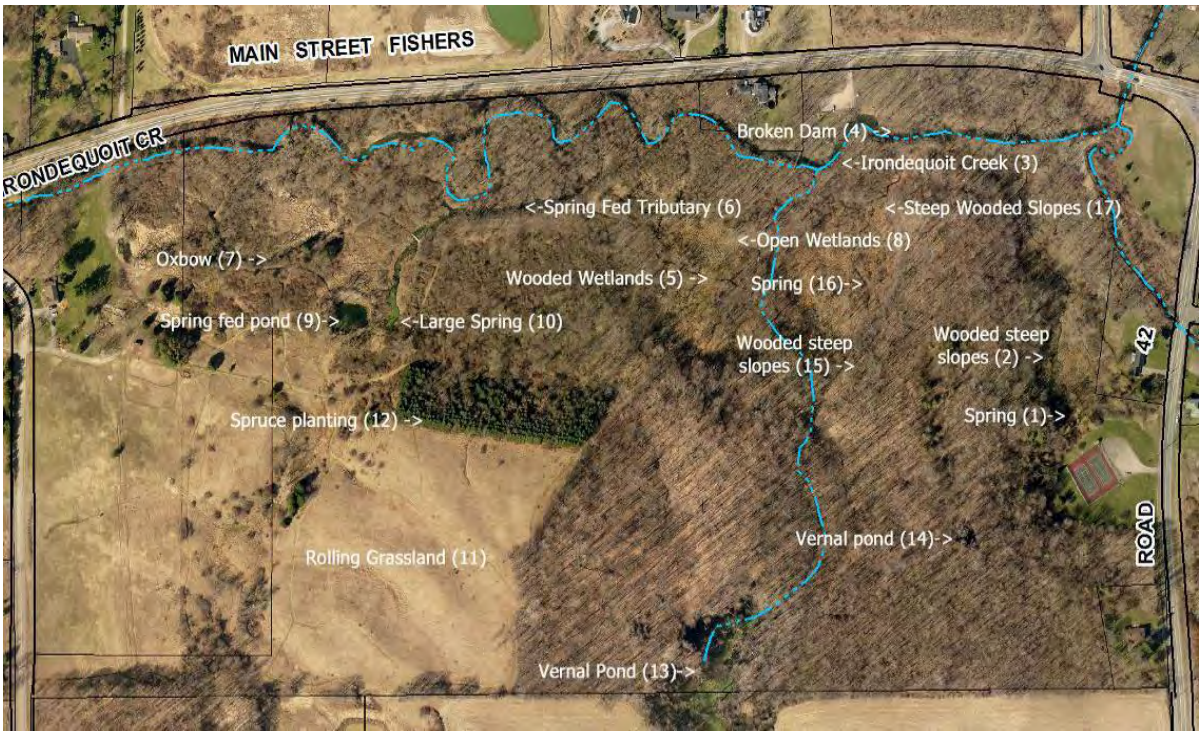
Photo 7.2 Boughton Park (Photographer: Lorraine Atwood)

As of 2013, parks in the Town of Victor include:

- Fishers Park
- Lehigh Crossing Park
- Boughton Park
- Dryer Road Park
- Ganondagon State Historic Site
- Harlan Fisher Park
- Mary Frances Bluebird Haven
- Mead Square Park
- Victor Municipal Park
- Village on the Park

The location of the parklands listed above are shown on Map 7.5 Parklands.

One of several parks that offers multiple natural resources is Fishers Park, located in the hamlet of Fishers. It is a 93-acre park containing a variety of natural resources including steep wooded slopes, vernal pools, wooded wetlands, and several springs that are part of the Irondequoit Creek headwaters. An extensive trail system meanders through the park across wooded ridges, through wetland areas, and along the banks of Irondequoit Creek. The park is home to a multitude of wildlife from deer, squirrels, and other woodland creatures to waterfowl and trout that spawn in the spring. Figure 7.3 is an annotated map of Fishers Park.


MAIN STREET FISHERS
RONDEQUOIT CR
Broken Dam (4) ->
<-Irondequoit Creek (3)
<-Spring Fed Tributary (6)
<-Steep Wooded Slopes (17)
<-Open Wetlands (8)
Oxbow (7) ->
Wooded Wetlands (5) ->
Spring (16)->
Spring fed pond (9)->
<-Large Spring (10)
Wooded steep slopes (15) ->
Wooded steep slopes (2) ->
42
Spruce planting (12) ->
Spring (1)->
Vernal pond (14)->
ROAD
Rolling Grassland (11)
Vernal Pond (13)->
Vernal Pond (13)->
Vernal Pond (13)->

For up-to-date information on the park system visit the Town website http://www.victorny.org/. To learn more about the park system and to access printable maps of local parks, including a Victor Hiking Trails map and maps of the trails in the Mary Frances Bluebird Park, Fishers Park, and Lehigh Crossing Park, visit the Victor Hiking Trails website: http://www.victorhikingtrails.org

7.4 TRAILS

In the 1980's, Victor's Conservation Board initiated the concept of an organization dedicated to developing and maintaining a trail system based on the trails used by Native Americans and the railroads that traversed the Town. Victor Hiking Trails, http://www.victorhikingtrails.org, a grassroots organization that began exploratory meetings in the fall of 1991, was born. As of 2013, there are currently over 30-miles of open trails. These include well connected multi-use rails-to-trails, secluded woodland rambles, streamside walks, and longer cross-town hiking trails. Some connect various town and state parks, others exist by themselves.

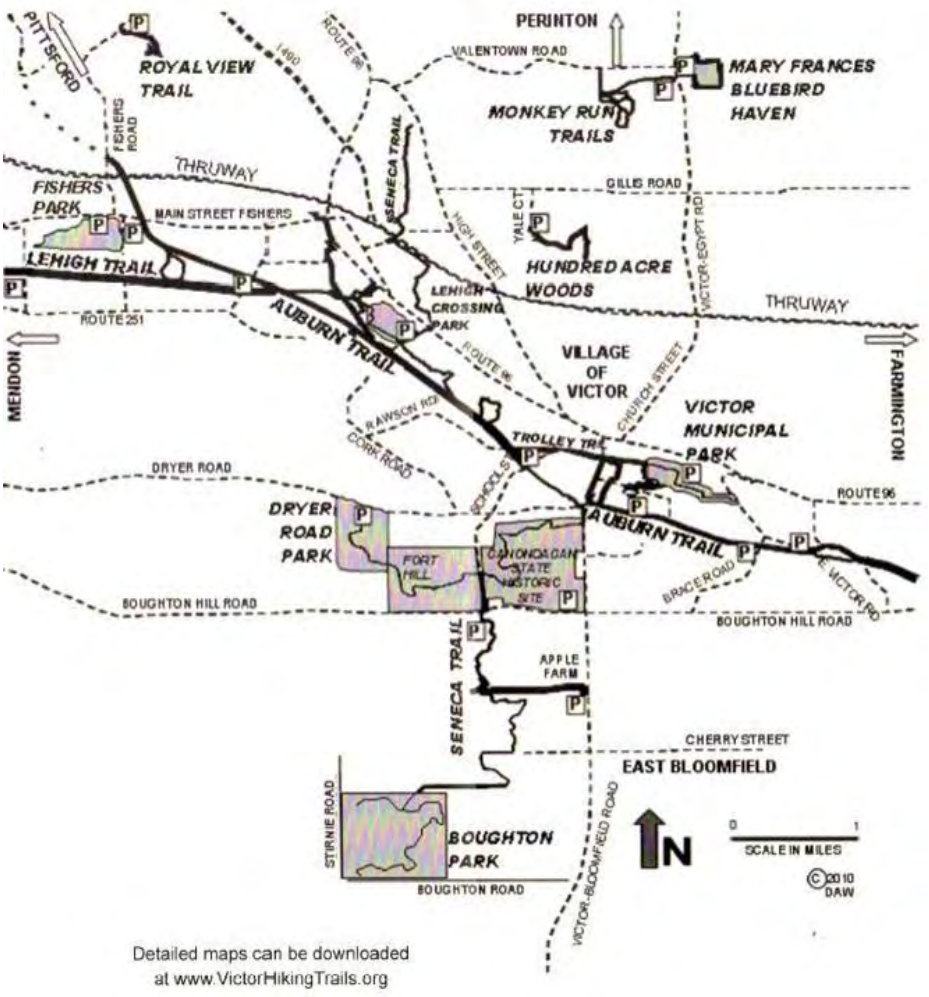


Figure 7.4 Hiking, Biking and Skiing Trails

The group actively scouts possible sites and negotiates with land owners and developers for permission of public access to their property. Their purpose is to develop a trail system which will preserve open space and provide an educational and recreational experience for everyone in the town of Victor. The organization provides education to the public through nature interpretation, historical information and proper use of trails.

The mission of Victor Hiking Trails is stated as:

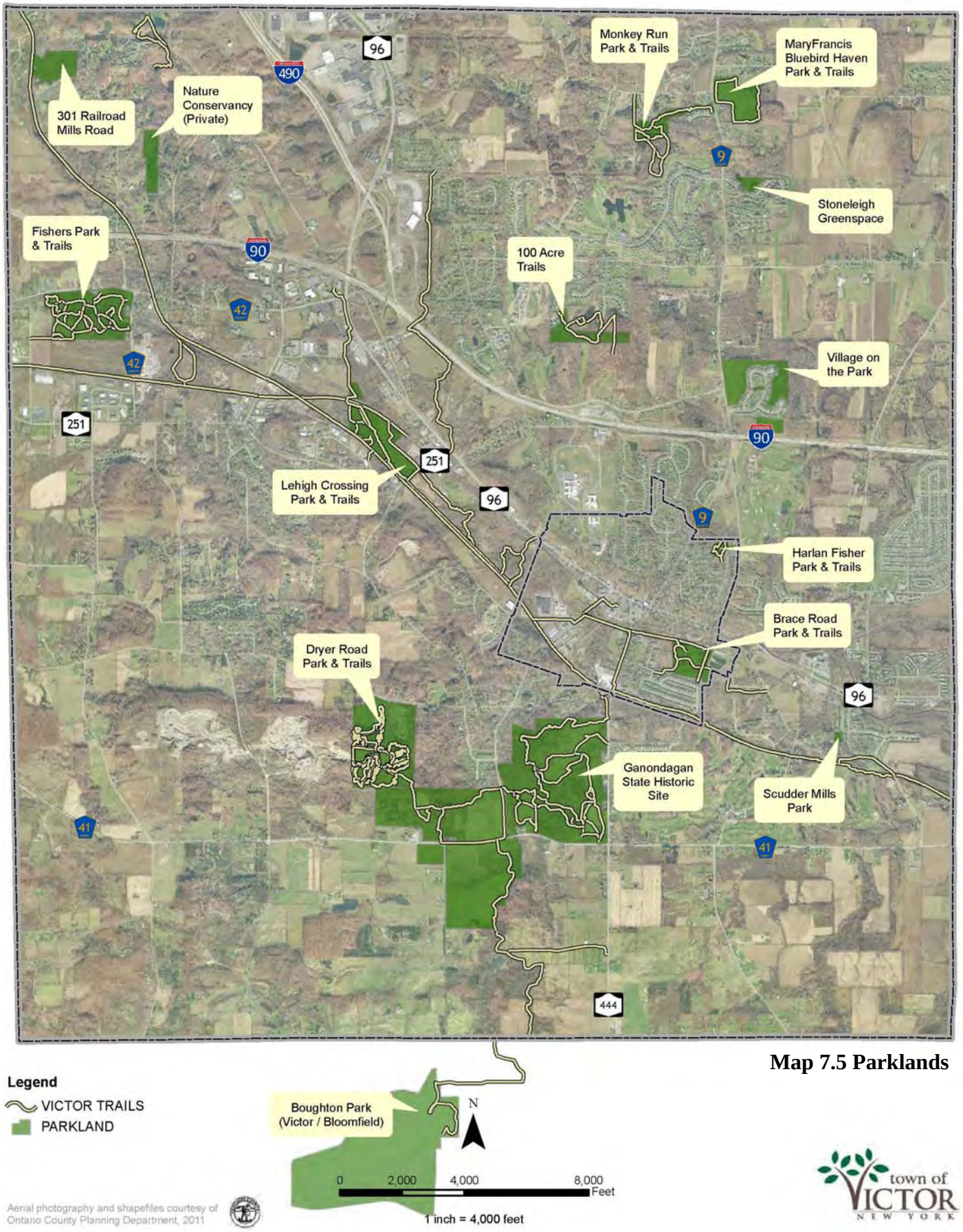
- ❖ Trails of various terrain, landforms, views and habitats for various plant and animal species.
- ❖ Trails in various geographic sections of the Town of Victor with access by as many residents as possible.
- ❖ Trails of various lengths and difficulties.
- ❖ Trails for foot traffic and paths for multi-use including bikes.

As of 2013, trails with the Town of Victor include:

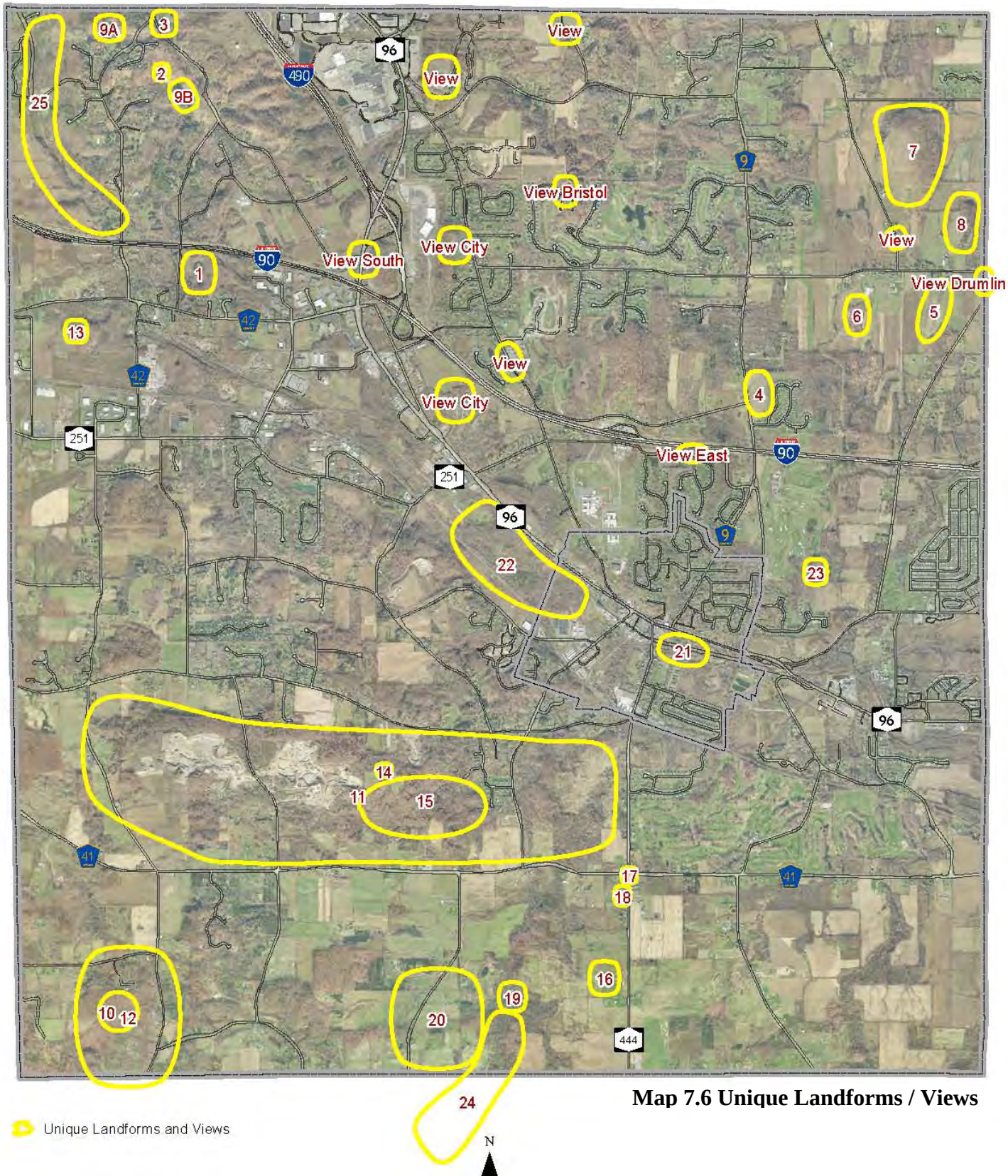
- Apple Farm Trail (0.8 miles)
- Auburn Trail (9 miles)
- Bluebird Trail (1 mile)
- Domine Trail (0.8 mile)
- Dryer Trail (1.5 miles)
- Fishers Landing Trail (0.4 miles)
- Hundred Acre Woods Trail (0.9 miles)
- Lehigh Trail (2.5 miles)
- Monkey Run Trails (2 miles)
- Royal View Trail (0.5 miles)
- Seneca Trail (7.5 miles)
- Trolley Trail (4 miles)

7.5 RECOGNIZED VIEWSCAPES & VANTAGE POINTS

Victor's topographic features, including its drumlins, steep slopes, rolling hills and kettles, were shaped by the receding of the Late Wisconsin glacier about 12,000 to 13,000 years ago (see NRI Volume 1, Section 1/ Victor's Geology for more detail). These features contribute to what we identify as recognized "viewsheds" an area that is visible from one or more viewing points, and "vantage points" a place from which something is viewed. Map 7.6 illustrates Unique Landforms/ Views in the Town of Victor. Table 7.7 follows Map 7.6 and provides a key to this map.



Map 7.5 Parklands



Map 7.6 Unique Landforms / Views

Callout	Description
1	Kettle lake by Log Cabin Rd
2	Kettle lake / South of Royal View
3	Kettle lake / Bottomless Pond also known as Crossman's Pond / Kettle hole
4	Drumlin: Village on the Park
5	Drumlin: South of Gillis Road between Brownsville and Gillis (Viewshed)
6	Drumlin: Gillis property / horse farm / preserved
7	Drumlin: South of Bortle Road, east of Blazey
8	Drumlins: Northeast of Thruway between County Road 9 and Town boundary (Victor / Farmington)
9A	Kettle lake
9B	Kettle lake
10	Southwest corner of Victor / Hopper Hills are glacial Kames
11	Moraine: Includes Ganondagan, Fort Hill, Dryer Road Park, and Gravel Pit
12	Highest point in the Town of Victor (Private Property) / High Ridge west of Strong Road
13	Viewshed: Looking to the north over Powder Mills Park from point in Fishers Park
14	Viewshed: Dryer Road Park looking north at western part of Village
15	Viewshed: Fort Hill looking south toward Bristol Hills
16	Viewshed: Apple Farm high point looking west at number 12 and southwest area of Town
17	Viewshed: State Rte 444 and County Road 41 / all directions
18	Boughton Hill Cemetery / Victor founders and early residents
19	Beaver pond on Apple Farm / Seneca Trail view
20	Murray Road / Stuart Trials / Rolling Hills
21	Great Brook - Mud Creek
22	Alkaline wetland / Southeast / Bordered by Lehigh and Auburn Trails
23	Unmolested Pond (Pashley Property, Feb. 2011)
24	Great Brook Stream (Sucker Brook) / Boughton Park to Village / Joins with Mudd Creek and Ganargua
25	Irondequoit stream corridor beginning at Thruway and continuing into Monroe County

Table 7.7 Unique Landforms/Views



8. HISTORICAL RESOURCES

The Town of Victor contains a wealth of historical resources which are cataloged and protected by the Victor Historic Resources Committee. Two notable examples, Ganondagon State Historic Site and Valentown, are described here.

For more information on Victor's historical resources visit the Town's website www.Victorny.org and follow the link under [DEPARTMENTS] to the [HISTORIAN].

Ganondagon State Historic Site www.ganondagan.org

Ganondagan (ga·NON·da·gan), is the site of a Native American community that was a flourishing, vibrant center for the Seneca people and is located on Route 444 (Maple Avenue) in the Town of Victor. Ganondagan is listed on the New York State Register of Historic Places.

Residents are able to tour the site where thousands of Seneca lived 300 years ago, and view a full-size replica of a 17th-century Seneca Bark Longhouse, walk miles of self-guided trails, climb the mesa where a huge palisaded granary stored hundreds of thousands of bushels of corn, and learn about the destruction of Ganondagan, Town of Peace, in 1687.

The State Historic Site encompasses 619 acres of land and has interpretive trials open to the public year round.

Valentown Historical Museum http://www.valentown.org/

Valentown is an intriguing historical museum, containing thousands of artifacts, objects and heirlooms that represent the local 19th century history of the Victor and Rochester, New York area. Valentown is listed on the National Register of Historic Places.

Valentown was originally built in 1879 as a shopping plaza and community center by Levi Valentine. Today it stands as a monument to his inspiration for building a town on top of his own family farm land. Levi Valentine had built Valentown next to land where a railroad was supposed to arrive. Unfortunately, the company that was building the railroad ran out of

funds and tracks before they could reach Valentown. Ultimately, Valentown was vacated and left untouched. In the 1940's, historian J. Sheldon Fisher's goal was to preserve Valentown as a historical museum.

Eventually, Mr. Fisher united Valentown with the Victor Historical Society. Five years prior to his passing at age 95, the Victor Historical Society bought the property and collection to ensure enjoyment and education for future generations.

Valentown Hall, Town Homestead and the 14 acres of Valentown are listed on the National Register of Historic Places.



Photo 8.1 Valentown Museum
(Town of Victor Photograph)

In addition, work has begun on a vision for the Hamlet of Fishers. The current draft of the Vision for the Hamlet of Fishers is included below.

The Vision for the Hamlet of Fishers

Prepared by Carole Fisher, Nat Fisher, Rick Kelbe, Babette Huber—Victor Town Historian

The Hamlet of Fishers is at a crucial point in its history. A vision shall be developed and implemented that will define the character and retain the history of the hamlet.

The vision will implement the following goals:

1. *Foster civic pride in the beauty and history of the past as represented in the hamlet's historic sense of place;*
2. *Encourage a walkable community that is not a main thoroughfare for commercial vehicles;*
3. *Investigate the appropriateness of becoming a designated historic district;*

4. *Foster, encourage and ensure the preservation, restoration and rehabilitation of structures, landmarks and neighborhoods;*
5. *Encourage a "hamlet" character;*
6. *Emphasize the historical and recreational experience;*
7. *On pedestrian streets, provide sidewalks; lighting which reflects the historical character of the hamlet; and street trees;*
8. *Preserve trees, landscape features and scenic views;*
9. *Provide space for community activities such as the Duathalon;*
10. *Identify compatible uses of existing buildings;*
11. *Provide connectivity to adjacent parks;*
12. *Provide open space/green space;*
13. *New buildings in the hamlet should reflect the overall hamlet character as defined by the historic structures and sites;*
14. *Contribute to the protection and improvement of property values through focusing on the vision.*

Additional Historical Resources in Victor will be addressed, as resources permit, in conjunction with Victor Historic Resources Committee.

9. ACKNOWLEDGEMENTS

The 2014 Town of Victor Natural Resource Inventory (NRI) would not have been possible without the Victor Town Board's encouragement and financial support. Special thanks to **Supervisor Jack Marren** and **Councilmen Jack Dianetti** and **Jeff Cody**. **Councilman Dianetti** deserves special recognition for his vision of land use and environmental possibilities in Victor as well as his unwavering efforts to bring the NRI to fruition.

This NRI was developed through a collaboration among several agencies, organizations and dedicated local experts and scientists who donated their time to the project. Many thanks to:

BME Associates authored the scientific study and analysis of Victor's natural environment, with particular focus on habitat, including in-depth study of Co-Occurrences, Connectivity and Wildlife Habitat. The scientists spent months evaluating existing data and walking the land to provide ground truth. They know Victor like the back of their hands; additionally they care about the natural environment's viability and health.

> **Peter Vars**, P.E., BME President; **Mike Simon,** Environmental Services Manager & Project Engineer, Project Manager; **Martin Janda,** Wetland Services Manager & Project Engineer extraordinaire; and **Tiffany Toukatly**, Wildlife Habitat expert. Martin and Tiffany ground-truthed the mapping data and assessed the health of the natural areas.

LaBella Associates provided the Victor Conservation Board a foundation on which to build the NRI, created the maps, outlined an organizational approach to the narrative, contributed narrative material—in some cases uncovering information vital to our effort—and responded to the NRI committee's editorial comments. In the NRI's final stages, **LaBella Associates** revisited the draft NRI's organization, edited the text and redesigned the format for flow and clarity, and contributed two sections of narrative.

> **Mark Tayrien**, Project Manager and visionary; **Barb Johnson**, Open Space Index; **Wes Pettee**, mapping, initial organization & some narrative; **Kathleen Spencer**, text /format evaluation and revisions; **Mark Tayrien** & **Steve Metzger**, Steep Slope Guidelines; and the LaBella IT wizards who untangled the document's digital mysteries.

For many years the Conservation Board has been asked to provide the science to support its recommendations. Thanks to the hard work of BME and Labella, we now have it.

Ontario County Planning Department provided map data to LaBella, developed the fully ground-truthed Generalized Land Cover map that provided data for our Open Space Index:

> **Thomas Harvey**, Director of Planning, Ontario County; **Bruce Gilman, Ph.D,** Director of Muller Field Station, Director of and Professor in Finger Lakes Community College's Environmental Conservation & Horticulture Department, who ground-truthed the entire Generalized Land Cover Map; **Sheri Norton, GIS** Coordinator, Information Services,

Ontario County; **Terry Saxby,** Sr. Planning Aide, Ontario County, a driving force behind delivery of accurate, up-to-date, data and maps to Victor.

1970's Victor Conservation Council - created Victor's first Open Space Rationale and Index; the rationale is included in the Appendices section of this document. Its insights are valuable today. In fact, the Town is still addressing the issues raised in the Rationale. Committee members are listed in the Rationale (see Appendix F).

1980 – 90's Victor Conservation Board – Concerned with development impacts on Victor's groundwater supply, the Board commissioned **Richard A. Young,** Geologist at SUNY Geneseo, to complete a study of Victor's groundwater resources. This report is on file in the Town of Victor's Archives. **Gil Holtz** and **Craig Smith's** vision of ground and surface water protection informs today's Victor Conservation Board's Stream Corridor protection efforts. The Green Infrastructure Plan included in the Draft Comprehensive Plan revision is in large part a result of their efforts.

Members of Victor's Natural Resource Inventory Subcommittee deserve recognition for facilitating this project and providing overall direction to complete this comprehensive document. Participants on the subcommittee include: Lorraine Atwood, Donna Clements, Leslie Connell, Kate Crowley, Marge Elder, Larry Fisher, Maureen Hiler. Thanks also to other members of the Conservation Board who provided much needed editorial advice and support, including Ken Kolaczyk, John Hotto and Mark Rugaber.

Other Contributors:

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Lebanon, New Hampshire – provided CD of their Natural Resource Inventory.

Raymond Jr., Lyle S. author of Aquifers. Bulletin No. 3. NYS Water Resources Institute Center for Environmental Research, Cornell University, for granting us permission to include sections of the bulletin in the NRI.

The Nature Conservancy, Central and Western NY Chapter, Photographs

Rochester Museum and Science Center (RMSC)

Lee Kemp (librarian) Schuyler C. Townson Library

George McIntosh (Curator of Geology - Director of RMSC Collections Department

Permission to use the Old Ontarion map found in T*he Genesee Country: A Field Guide to Various Natural Features which Reveal the Geologic Past b*y Thomas G. Payne, Assistant in Geology; Guide Bulletin No 5; Published by Rochester Museum of Arts and Sciences; Arthur C. Parker, Director; Rochester, NY; 1938.

Richard A. Young - Distinguished Professor of Geological Sciences, SUNY Geneseo, Glacial Geologist; shared his time, expertise and resources on Victor's geologic history.

Norfolk, Connecticut, and Dutchess County, New York, Natural Resource Inventories from these counties were used as models for Victor's NRI.

Town of Victor Residents

Marsha Bryan - Former Victor resident and former Conservation Board member, who walked most of Victor's land in search of special places eligible for protection and provided a vast archive of materials.

Marge Elder - Victor resident and former Conservation Board Chair, who provided her time and resources editing the first edition of the Natural Resource Inventory. Marge was instrumental in creating the vision for Victor's Natural Resource Inventory and cares deeply about Victor's rich natural resources. She is committed to educating the public in how the features were formed and to the importance of preserving them for future generations. Marge has mentored Conservation Board and Town Board members in understanding the complexity of balancing preservation and development. She continues to serve the Town as a Conservation Board Member, Emeritus, to see the NRI to completion.

Lewis Fisher - Victor resident, for information on the redirection of Irondequoit Creek

John Francis - Victor resident, contributed materials on Victor's glacial history

Babette Huber – Town Historian, whose book "Victor, NY: Centennial to Bicentennial" has been a helpful resource.

Maura Steed - Victor resident, contributed information and photograph of vernal pool located on her property.

Steve Straight - Victor resident, for providing information on farmed lands in Victor.

Bonnie Waters - Victor resident and Town employee, for information on Victor's historic properties.

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TOWN OF VICTOR NRI – APPENDIX B
OLD ONTARION RIVER

Lake Ontario in Valley of Old Ontarian River

A PICTO-GUIDE to the Natural Features of the GENESEE COUNTRY

COMPILER Thomas G. Payne

ARTIST W.F. Fraatz

PUBLISHED BY Rochester Museum of Arts and Sciences

Level Skyline

Hilltops Part of Ancient Peneplane

N. Cohocton

Wayland

Dansville

Nunda

Portageville

Upper Fall

Middle fall

Lower Fall Glenn Iris

Letchworth Park

Middlesex

Bristol Springs

Canandaigua Lake

Honeoye Lake

Canadice Lake

Hemlock Lake

Conesus Lake

Mt. Morris

Perry

Silver Lake

Fall Brook

Bristol Valley Gas Field

Burning Spring

Deep Run

Tichenor Ravine

Honeoye

Hemlock

Geneseo

Lakeville

Jaycox Run

Retsof Salt Mine

Canandaigua

Lima

Avon

Honeoye Falls

Pavilion Gas Field

Quarry

Oatka Creek

Leroy

Dutternilk Falls

Dr. Bow Lake

Caledonia

Gypsum Mine

Rush

Victor

Scottsville

Palmyra Drumlin District

Hanford Rinds Park

Kames and Kettles

A Drumlin

Palmyra

Pittsford

Barge Canal

Methodist Hill

A Drumlin

Glacial Outwash Plains

Bergen

Fairport

Pinnacle Range

Quarry

Glacial Striations in Bed Rock

Sand banks

Glacial Boulders and Erratics

ROCHESTER

Densmore Creek

Spencerport

Delta Deposits

Ridge Road

Bars of Shoreline and Queenston Strata along Shore

Glacial Lake Iroquois

Barge Canal

Former Bottom of Glacial Lake Iroquois

Chemung Group
Sandstones and Shales

Palecypod

Glass Sponge

Brachiopod

Gastropod

Portage Group
Sandstones and Shales

Goniatites

Brachiopods

Pteropods

Crinoid

Gastropods

Pelecypods

Genesee Shale

Devonian Corals

Hamilton Shales and Limestones

Trilobite

Pelecypod

Gastropod

Brachiopods

Onondaga Limestone

Rocks of Devonian Age

Onondaga Escarpment

Boundary between Appalachian Plateau and Central Lowlands Provinces

Rocks of Silurian Age

Salina Group

Eurypterids

Lockport Dolomite

Honey-comb Coral

Stromatopora

Chain Coral

Lockport Escarpment

Clinton Shales and Limestones

Medina Red Sandstone

Brachiopod

Graptolites

Trilobite

Cup Coral

Crinoid

Gastropod

Worm Burrows

Queenston Red Shale

LEGEND

Pre Glacial Drainage Valleys

Present Drainage

Swampland

Auto Routes

Formation Contact Line

Escarpment

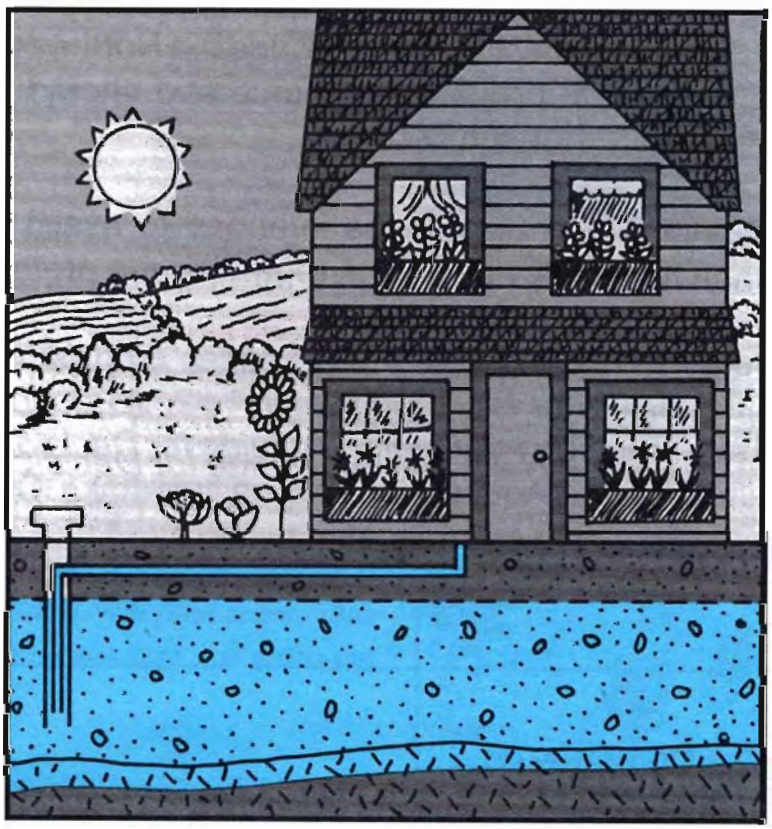
Contact Grading into Escarpment

FRAATZ '31

TOWN OF VICTOR NRI – APPENDIX C
AQUIFERS

AQUIFERS

Lyle S. Raymond Jr.
New York State Water Resources Institute
Center for Environmental Research
Cornell University



Aquifers are full of water!

What are aquifers?

Why are they important?

PURPOSE OF THIS BULLETIN

Aquifers are a rather mysterious and frequently misunderstood concept. Too often, the term is glibly used without a clear indication of what an aquifer is.

This bulletin explains what aquifers are in nontechnical language. Readers who wish to find out more about aquifers are referred to other sources, some of which are listed at the end of this bulletin.

Sand and gravel aquifers are emphasized because they are the most highly productive aquifers in New York and the Northeastern U.S. They are a significant local and regional resource and should receive protection commensurate with their importance.

The information in this bulletin is intended to assist local officials and citizens in making policy decisions regarding the protection of aquifers.

This is the third bulletin in a four-part series on groundwater. The other bulletins are #l, "*What Is Groundwater?*' #2, *"Groundwater Contamination,"* and #4, *"The Tug Hill Aquifer: A Guide for Decision Makers."* Bulletin #4 uses the Tug Hill Aquifer, located east of Lake Ontario, to illustrate options for local action to protect high yield sand and gravel aquifers.

ACKNOWLEDGEMENTS

This bulletin was funded (in part) by the New York State Legislature, through the New York State Department of Agriculture and Markets, and the State of New York Temporary State Commission on Tug Hill, Watertown, NY. Illustrations are by **Lucille Gagliardo** and design by **Mary Jane Porter.**

Many individuals contributed to this bulletin by their helpful comments. These include **John Martin Jr., Steven Pacenka, Keith Porter, Dennis Swaney,** and **Mark Walker,** Water Resources Institute and Center for Environmental Research, Cornell University; **Donald Beevers and Thomas Feeney,** Tug Hill Commission; and responses to preliminary drafts of the bulletin from Cornell Cooperative Extension agents and selected members of the public.

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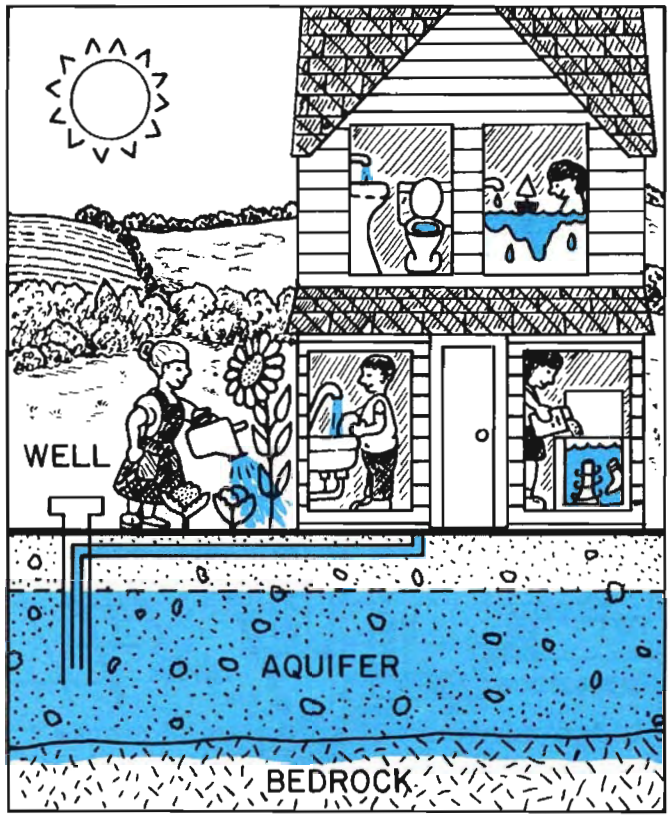
WHAT'S AN AQUIFER?

An aquifer is any soil or rock formation that contains water and permits sufficient water movement to yield water to wells and springs.

Low yield aquifers may supply only enough water for individual homes or farms.

Variable yield aquifers exhibit large differences in well yields, depending on the type and characteristics of material in the aquifer formation.

High yield aquifers are capable of supplying large quantities of water, sufficient to meet commercial, industrial and municipal needs.

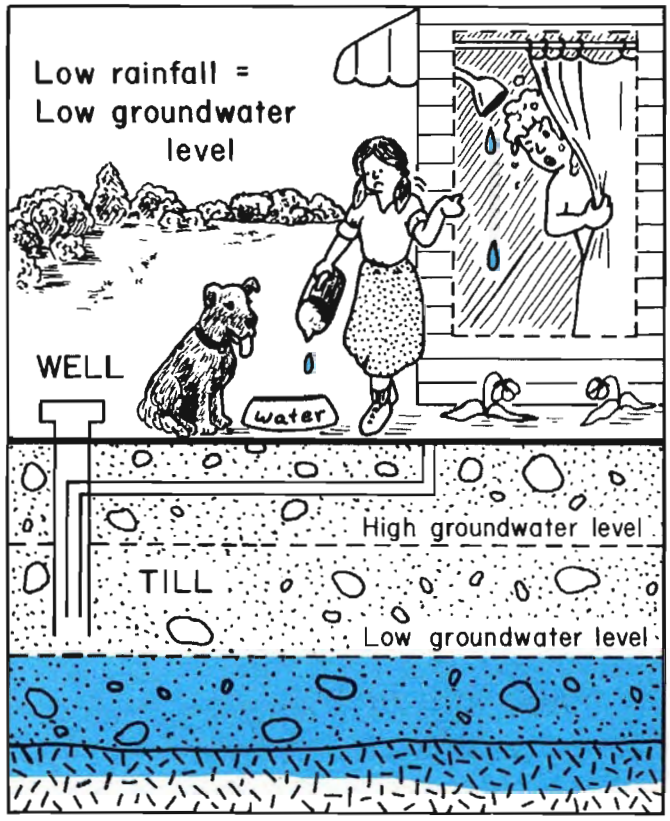


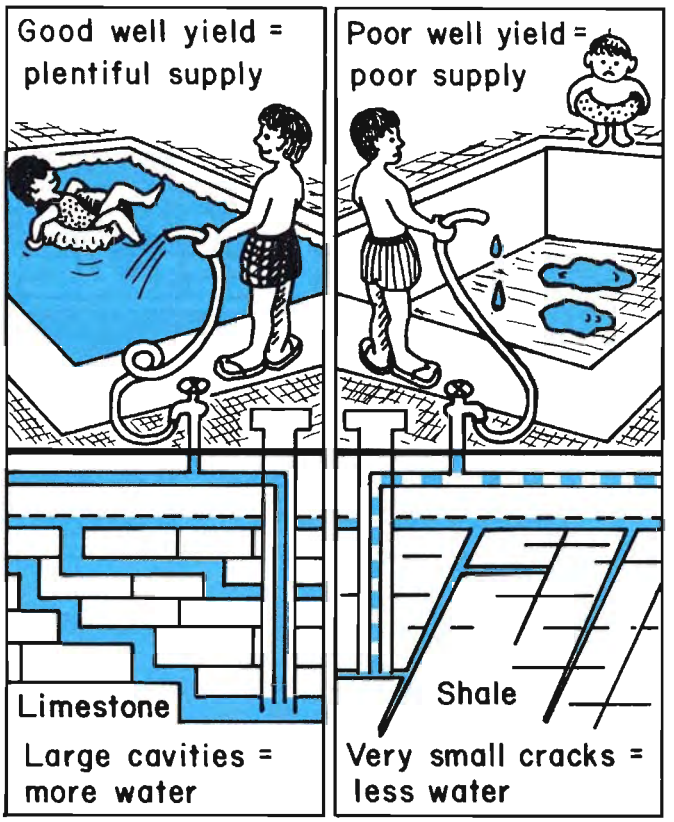
LOW YIELD AQUIFERS

Low yield aquifer formations have sustained well yields of less than 10 gallons per minute. Well yields at some sites in these formations may be less than one gallon per minute.

Thin till formations, containing a high percentage of clay and/or silt, have low well yields, for example. Till is a variable mixture of clay, sand, silt, gravel, and stones left behind by continental glaciers. It occurs throughout the northeastern U.S.

Thick till formations with a lower percentage of clay and/or silt have higher well yields.

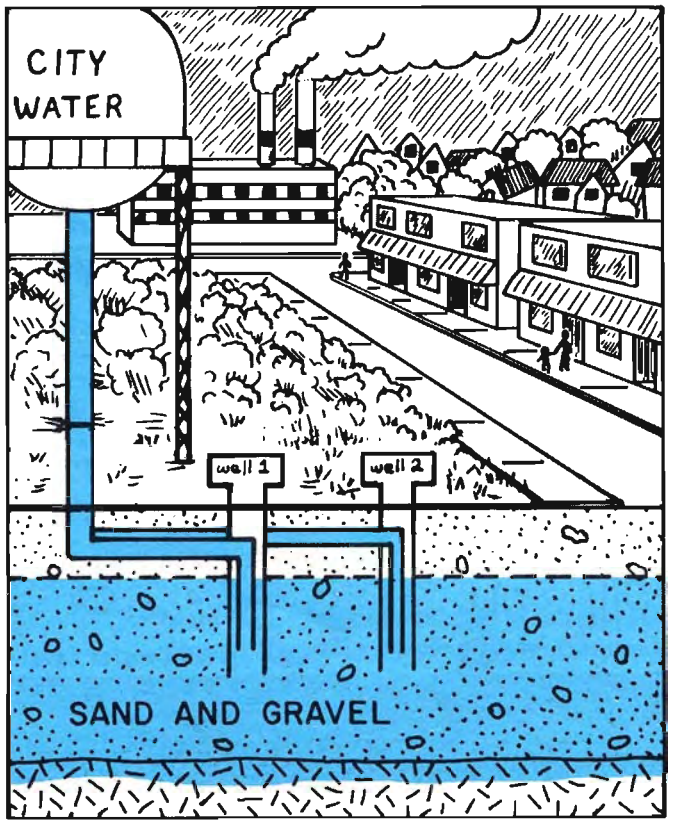




VARIABLE YIELD AQUIFERS

Variable yield aquifer formations exhibit large differences in well yields. Well yields in bedrock, for example, may vary from less than one gallon per minute to more than 500 gallons per minute. These widely divergent well yields result from differences in bedrock formations.

The density and size of openings in bedrock determines the capacity for water movement to sustain well yields. Some rocks are more porous than others; sandstone, for example, is more porous than granite. Fracturing also creates cracks and fissures; the degree of fracturing varies widely. Limestone gradually dissolves in water; wells that penetrate the cavities that are created can sustain high well yields.

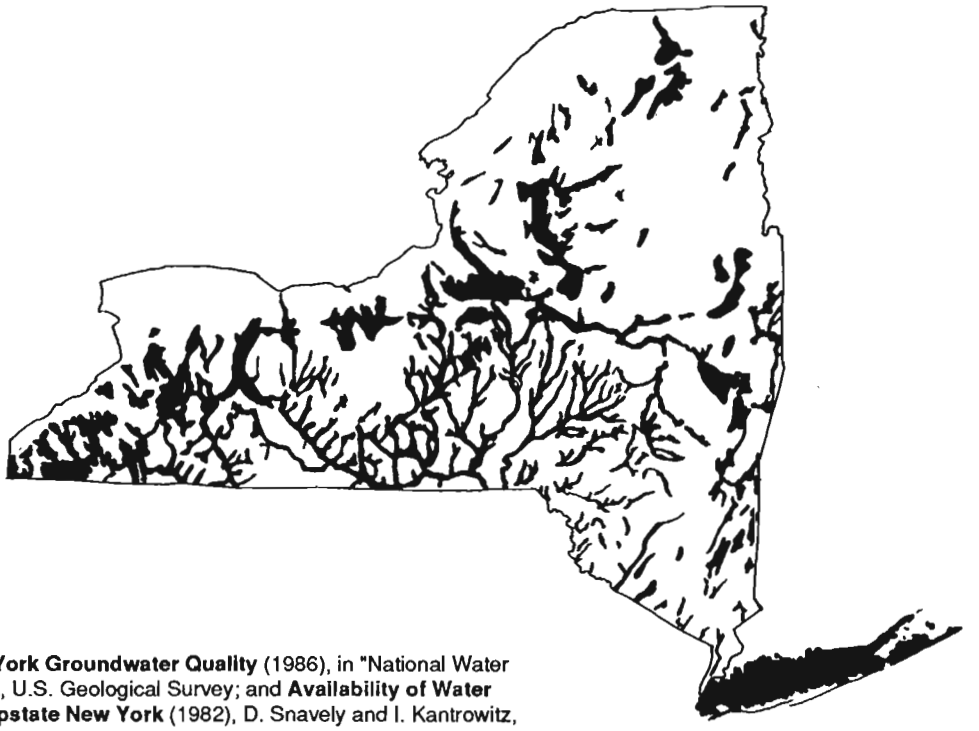


HIGH YIELD AQUIFERS

High yield aquifer formations can sustain well yields exceeding 10 gallons per minute. Well yields in the highest yielding aquifers reach hundreds to thousands of gallons per minute.

In the Northeastern U.S., the highest yielding aquifers are **sand and gravel** formations. Most of these sand and gravel formations were deposited by continental glaciers.

Low yield wells sometimes occur in otherwise high yield sand and gravel deposits due to the presence of interspersed layers of clay that block internal water movement in the aquifer.



Map Sources: **New York Groundwater Quality** (1986), in "National Water Summary: New York, U.S. Geological Survey; and **Availability of Water From Aquifers in Upstate New York** (1982), D. Snavely and I. Kantrowitz, USGS Open File Report 82-437, U.S. Geological Survey.

MAJOR SAND AND GRAVEL AQUIFERS IN NEW YORK

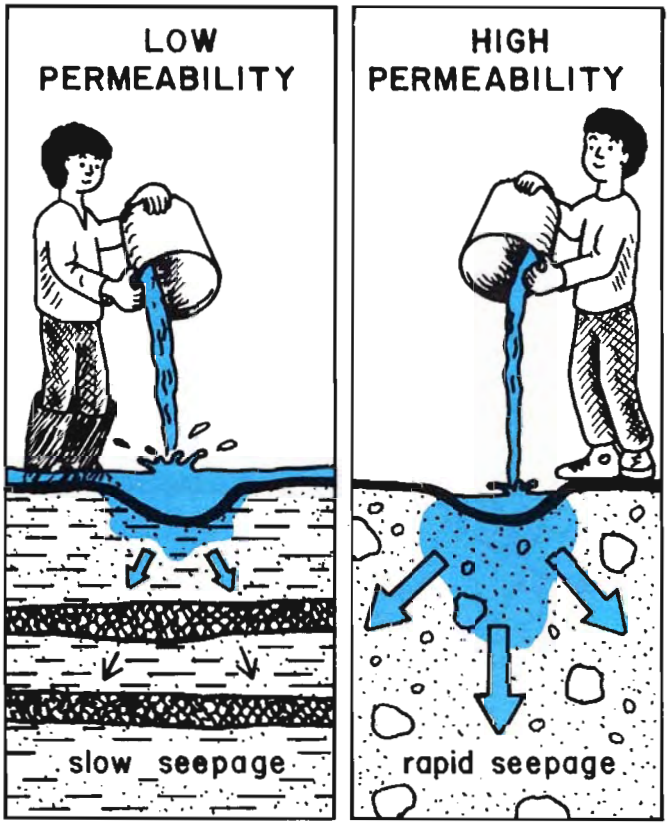
Sand and gravel formations were created as continental glaciers melted and retreated from the state. Valleys where glacial meltwater streams flowed usually contain extensive sand and gravel deposits. This includes nearly every major river valley. Deposits are also found in many smaller valleys not shown on a map of this scale.

Glacial lakes also formed in many valleys. Lake-clay deposits formed in the beds of these lakes, frequently covering sand and gravel beds deposited earlier. Sand and gravel beaches were formed, creating productive beach deposit aquifers if they are of sufficient thickness. Some glacial lakes were of enormous size, such as Lake Iroquois, that was much larger than present-day Lake Ontario. Lake Iroquois beach deposits are particularly well-formed along the western edge of Tug Hill, east of Interstate 81 north of Syracuse, NY.

Tremendous sand and gravel deposits were also formed along the outer fringes of the continental ice sheet at its farthest extent. Long Island and Cape Cod, for example, are composed of extensive deposits of sand and gravel formed in this manner. Long Island is the largest high yield sand and gravel aquifer in New York State.

WHY SAND AND GRAVEL AQUIFERS SHOULD BE PROTECTED

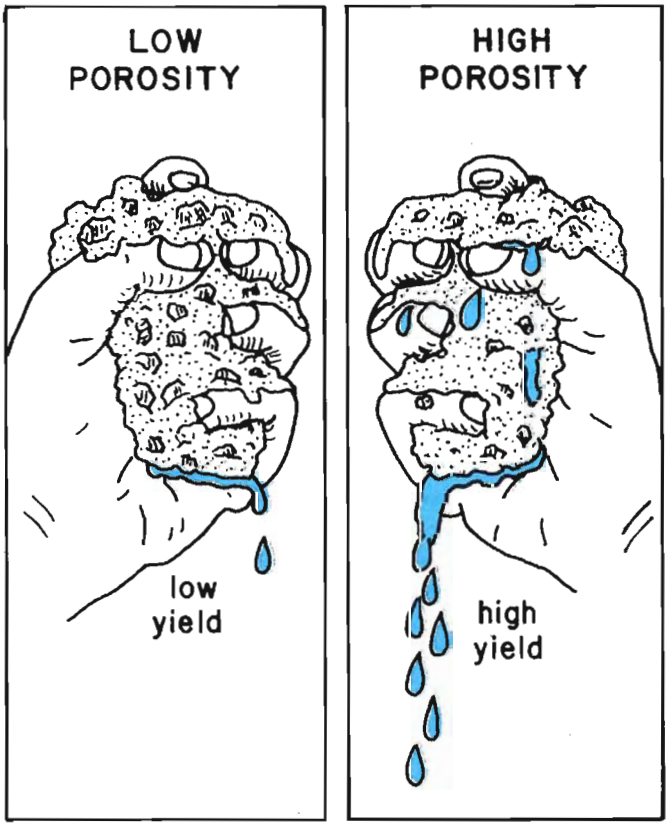
All aquifer formations, including low yield ones, should receive some degree of protection to prevent contamination of water supply wells and to maintain well yields. However, high yield sand and gravel aquifers need special protective measures because they have a combination of characteristics that set them apart from other water-bearing formations as a water supply source. These characteristics involve (1) permeability, 2) porosity, 3) pollution vulnerability, 4) uniqueness, and 5) regional significance.



High Yield Sand & Gravel Aquifers:
PERMEABILITY

Permeability is a measure of water movement through porous material. Sand and gravel aquifers have high permeability, allowing water to be readily transmitted through these formations. The average permeability of an aquifer formation is known as transmissivity, or capability to transmit water.

Sand and gravel formations can capture large quantities of rain and snowmelt if no overlying impermeable formations prevent infiltration. If overlying formations prevent infiltration from the surface, water is readily transmitted from adjacent areas to create a confined aquifer. Sand and gravel aquifers can sustain high well pumping rates and provide copious flows to springs, streams and wetlands.



High Yield Sand & Gravel Aquifers:
POROSITY

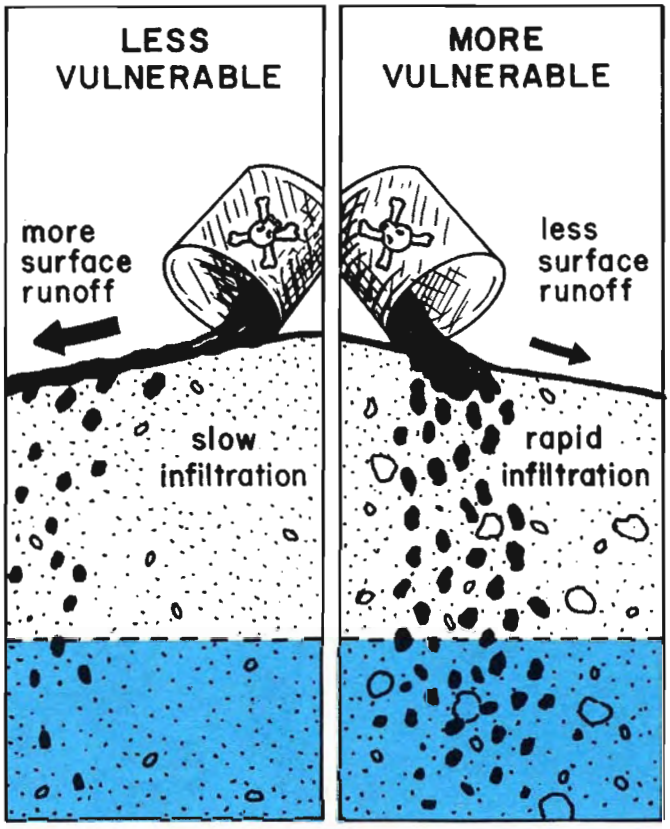
High yield sand and gravel aquifer formations are capable of storing large volumes of water. This is called high porosity. An outstanding characteristic of high yield sand and gravel aquifers is that they have **both high porosity and permeability**.

Porosity varies with the specific makeup of the sand and gravel aquifer. It is important because it indicates the maximum amount of water that the aquifer can hold when it is saturated. Only part of this water is available to supply wells or springs, however, because some will remain in the aquifer as a film on particle surfaces and in very small openings. The amount that will drain out is called the specific yield.

High Yield Sand & Gravel Aquifers: POLLUTION VULNERABILITY

Sand and gravel formations that lie close to the land surface are **easily contaminated**. Contaminants can rapidly infiltrate the water table before degradation takes place to reduce their concentrations. This also means there is less response time to take remedial actions after contaminant spills.

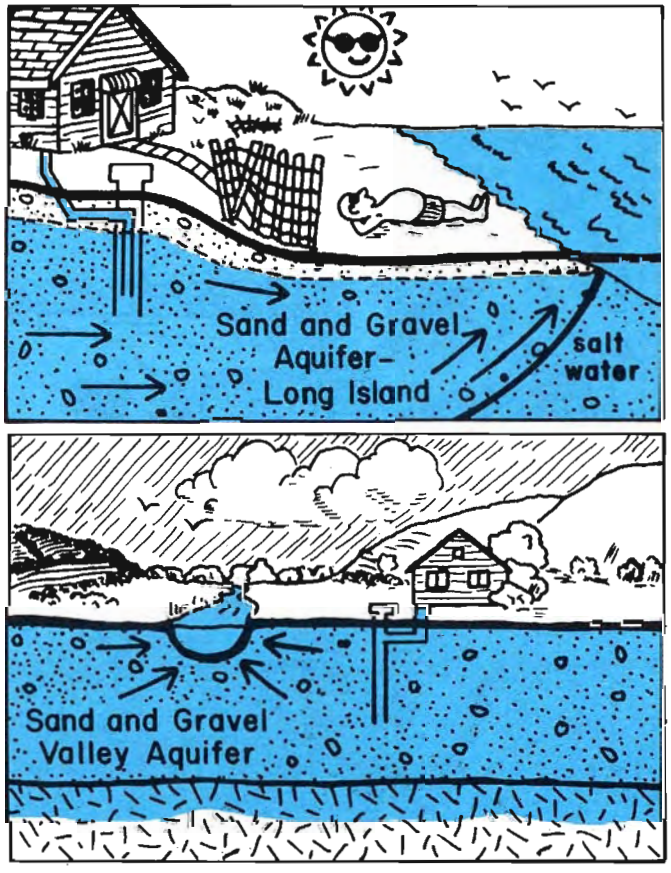
Once contaminants enter the aquifer, they are transmitted rapidly through the permeable sand and gravel. This contamination plume may threaten wells and nearby streams, lakes and wetlands that receive aquifer discharges. A large groundwater supply may be affected due to the high porosity of sand and gravel formations.

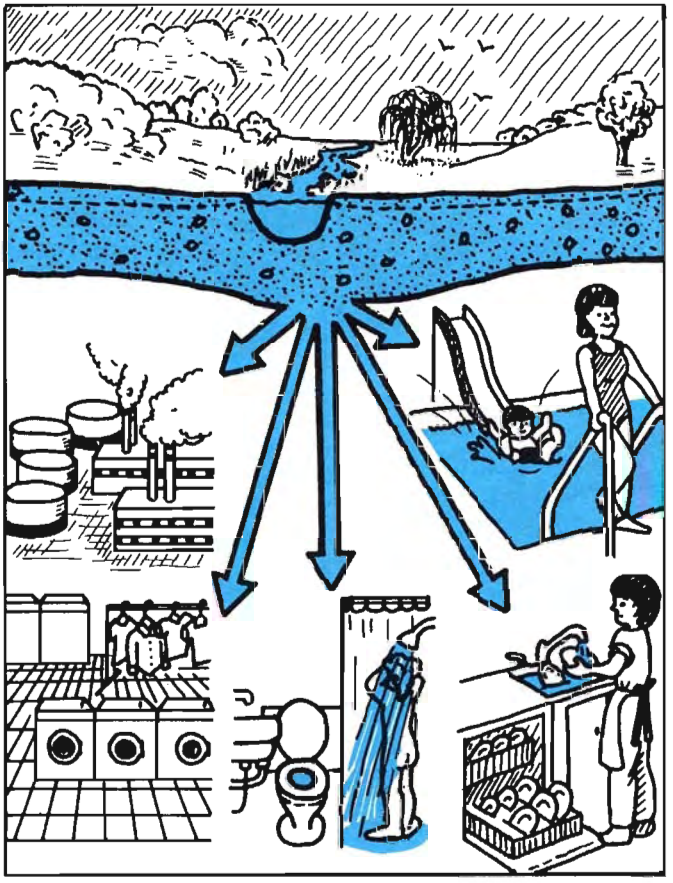


High Yield Sand & Gravel Aquifers: UNIQUENESS

High yield sand and gravel formations are a **unique groundwater resource**. About 11 percent of New York State contains sand and gravel deposits, including the Long Island sand and gravel aquifer. Excluding Long Island, only about 9 percent of upstate New York is underlain by these highly productive sand and gravel deposits.

Sand and gravel deposits occur only in specific areas due to the nature of their formation. In New York, these are primarily river valleys, the Long Island formation and glacial lake beach deposits. These areas are also frequently considered to be prime development sites.



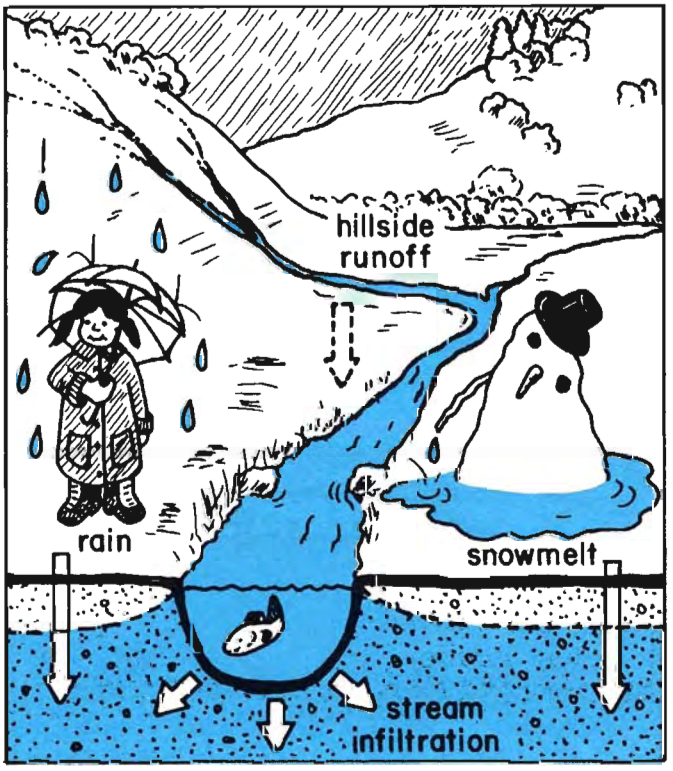


High Yield Sand & Gravel Aquifers:
REGIONAL RESOURCE

High yield sand gravel aquifers are a significant **regional water supply resource.** This becomes a critical issue when water supplies for communities in the area become polluted or inadequate to meet water supply needs.

The Long Island aquifer and 18 other high yield sand and gravel aquifers in upstate New York have been classified as Primary Water Supply Aquifers.

Other high yield sand and gravel aquifers not currently receiving significant use in upstate New York are potential water supply reserves for future needs. The most significant ones have been classified as Principal Aquifers.



WHERE DOES AQUIFER WATER COME FROM?

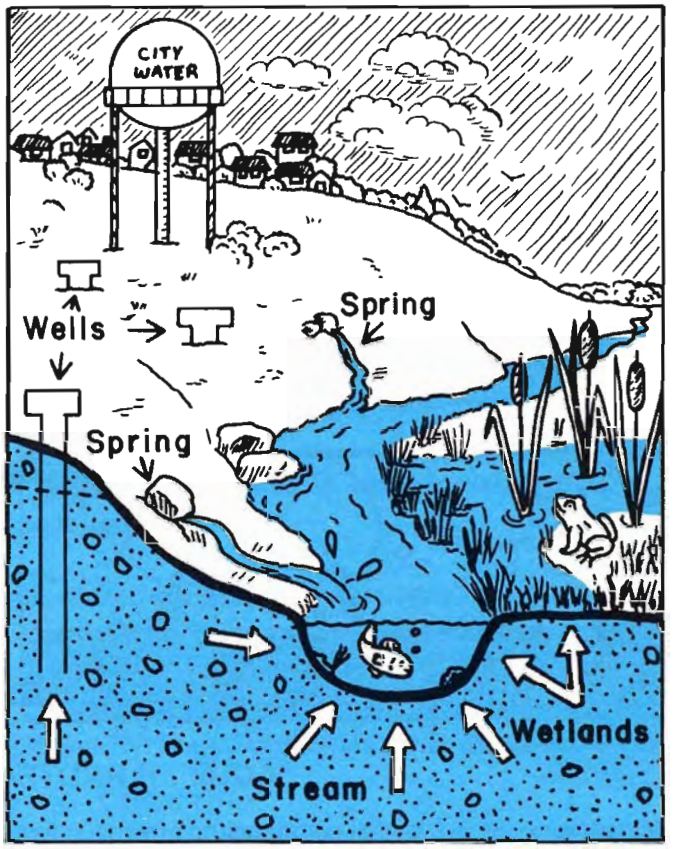
Water that replenishes an aquifer is known as **recharge**. Recharge of sand and gravel aquifers originates with rain and snowmelt infiltration from the ground surface, and infiltration from streams or underground flow from adjacent areas. Most groundwater recharge takes place from late fall to early spring, when plants are dormant and are not removing large amounts of soil moisture by transpiration that returns to the atmosphere.

A determination of the rate of replenishment, or recharge, and the aquifer's porosity and capability to transmit water (permeability) will indicate the density and size of wells that can be accommodated without harm to the aquifer supply.

WHERE DOES AQUIFER WATER GO?

Water leaves an aquifer by **discharging** into streams, wetlands, and lakes. This occurs by bank seepage and discharges from springs. During dry periods, water flowing in streams may be composed largely of discharges from stored groundwater. In this manner, aquifers are similar to reservoirs, slowly releasing stored water during rainless periods. Water well pumping is also a significant discharge route in some areas.

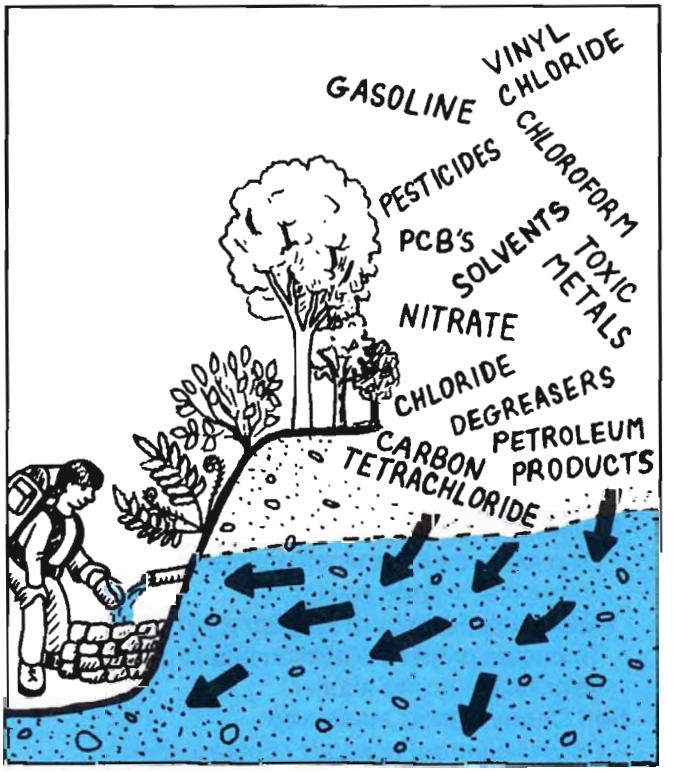
Under natural conditions, aquifer **recharge and discharge** are in balance. Whereas recharge is intermittent, discharge is continuous because the aquifer acts as a storage reservoir to maintain outflow. However, aquifer discharges will cease when the water table level falls below discharge points.

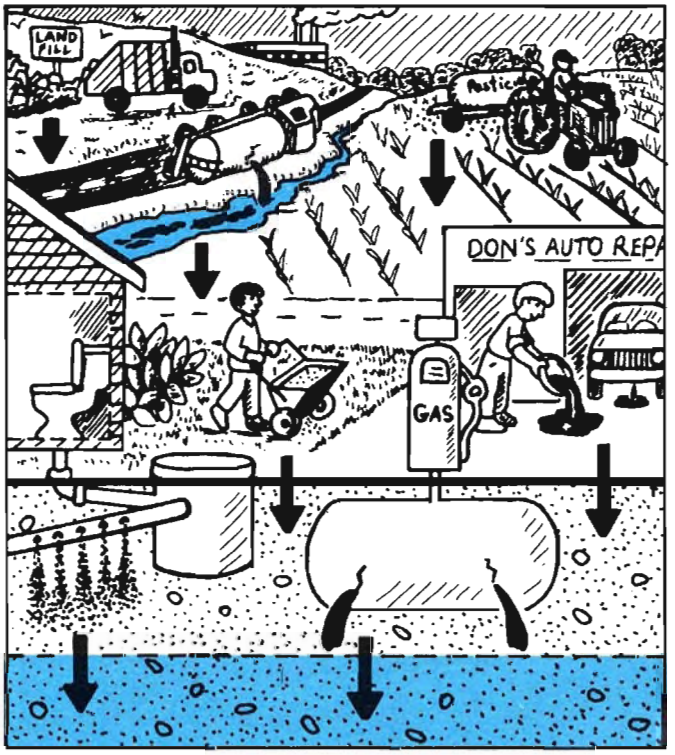


AQUIFER POLLUTION

Major contaminants that have been found in groundwater in New York State include: (1) degreasers; (2) gasoline and other petroleum products; (4) pesticides; (5) nitrates; and (6) chlorides. Bacteriological contamination is also a common problem.

Other contaminants that have been found include polychlororinated biphenyls (PCB's), chloroform, vinyl chloride, carbon tetrachloride, and toxic metals. A variety of natural substances may also adversely affect groundwater for human use, such as excessive amounts of sulfur, salt, iron, manganese, or barium, for example.





AQUIFER POLLUTION SOURCES

Common **sources of groundwater contamination** are: (1) leaks and spills at industrial and commercial facilities; (2) improper commercial and industrial disposal; (3) improper use and disposal of pesticides by farmers, homeowners, businesses and industries; (4) landfills; (5) septic systems; (6) storage and use of road deicing salts; (7) liquid waste storage lagoons; (8) agricultural and lawn fertilization; (9) disposal of animal wastes; (10) leaking underground storage tanks; (11) pipeline breaks; and (12) inadequately sealed wells. Saltwater intrusion is a problem on Long Island due to excessive well pumping from the aquifer.

AQUIFER PROTECTION MEASURES

The following list is a partial compendium of various types of actions that may be considered for aquifer protection.

1) **Septic Tank Regulations**
2) **Subdivision Regulations**
   Density, waste discharges, runoff control, for example
3) **Highways**
   - Design and maintenance, such as use of deicing salts
4) **Critical Area Controls**
   - Example: Purchase land or easements in well contribution zones
5) **Development Moratoriums**
   - Until a plan can can be devised to minimize development impacts
6) **Public Education Programs**
   - To promote proper practices, such as proper hazardous chemical disposal
7) **Aquifer Protection Plans**
   - Develop overall management plan with other towns that include aquifer
8) **Water Well Permits or Registration**
   - To ensure proper installation and to develop information on the aquifer
9) **Soil Conservation Measures**
   - Control potential nonpoint contamination from runoff and infiltration
10) **Forest Management**
    - Preserve forest cover in critical areas
11) **Wastewater Treatment Standards**
    - Volume and type of wastewater discharges into aquifer
12) **Critical Areas**
    - Designate critical aquifer recharge areas, contribution zones for public well supplies
13) **Water Supply Rules and Regulations**
    - To control land use practices that can lead to contamination of public water supply wells
14) **Waste Disposal Regulations**
    - In addition to state regulations to further protect aquifer from leachate contamination
15) **Incentive Programs**
    - To encourage practices that will protect the aquifer
16) **Monitoring**
    - Early detection of aquifer contamination so that control actions can be taken
17) **Underground Storage Tanks**
    - In addition to state program, inventory all UST's and develop local controls as needed
18) **Environmental Quality Review Act (SEQRA)**
    - Environmental assessments and/or environmental impact statements

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TOWN OF VICTOR NRI – APPENDIX D
RIPARIAN BUFFER ZONES:
FUNCTIONS AND RECOMMENDED WIDTHS

Riparian Buffer Zones: Functions and Recommended Widths



Prepared by

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Yale School of Forestry and Environmental Studies

For the

Eightmile River Wild and Scenic Study Committee

April 2005

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1. Functions of Riparian Buffers

Riparian buffers are vital elements of watersheds, primarily due to their protection of surface and ground water quality from impacts related to human land use. These vegetated buffers are complex ecosystems that provide food and habitat for unique plant and animal species, and are essential to the mitigation and control of nonpoint source pollution. In fact, the removal of streamside vegetation, primarily for development purposes, has resulted in degraded water resources and diminished value for human consumption, recreation, and industrial use.[1]

In the Eightmile River watershed, maintenance of riparian buffers in their natural condition has been identified as one of the most effective means of protecting multiple outstanding resource values (ORVs), including water quality, hydrology, unique species and natural communities, and watershed ecosystem function.

Sedimentation increases turbidity and contributes to rapid siltation of waterbodies, negatively impacting water quality. Increased sediment loads also narrow channel widths and provide substrate for colonization of invasive aquatic plant species. Intact riparian buffers ameliorate these negative impacts by stabilizing streambanks. Roots of riparian vegetation deflect wave action and hold bank soil together. The buffer vegetation also decreases erosional impacts during flood events and prevents undercutting of streambanks.

Excess nitrogen and phosphorous from fertilizers and animal waste, as well as other pollutants originating from pesticides and herbicides, often bond to soil particles. The nutrient-loaded sediment contained in surface runoff then flows to the nearest waterbody and is deposited. This process is the primary cause of accelerated eutrophication of lakes and rivers[2]. Streamside forests function as filters, transformers, and sinks for harmful nutrients and pollutants[3]. Buffer plants slow sediment-laden runoff and depending upon their width and vegetational complexity, may deposit or absorb 50 to 100% of sediments as well as the nutrients and pollutants attached to them[4]. When surface water runoff is filtered by the riparian buffer approximately 80 to 85% of phosphorous is captured[5]. Nitrogen and other pollutants can be transformed by chemical and biological soil activity into less harmful substances. In addition, riparian plants act as sinks, absorbing and storing excess water, nutrients, and pollutants that would otherwise flow into the river, reducing water quality.

One of the most important functions of riparian buffers is enhanced infiltration of surface runoff[6]. Riparian vegetation in the buffer surrounding a waterbody increases surface roughness and slows overland flows. Water is more easily absorbed and allows for groundwater recharge. These slower flows also regulate the volume of water entering rivers and streams, thereby minimizing flood events and scouring of the streambed.

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[1] Welsch 1991
[2] Jontos 2004
[3] Welsch 1991
[4] Connecticut River Joint Commission 2005
[5] Connecticut River Joint Commission 2005
[6] Dillaha et al. 1989

Many plant and animal species depend on the distinctive habitat of riparian buffers, which include elements of both terrestrial and aquatic ecosystems. Forested buffers improve habitat quality by providing shade that cools water temperatures, thereby elevating the dissolved oxygen content that is necessary for many species of fish and aquatic insects. Woody debris from shrubs and trees within the vegetated buffer provides food and cover for a multitude of aquatic species. If large enough, buffers also provide corridors essential for terrestrial wildlife movement.

Vegetated buffers may serve as screens along waterways, protecting the privacy of riverfront landowners and blocking views of any unsightly development. Hiking and camping opportunities are also facilitated by forested buffers, which if large enough, allow outdoor enthusiasts to enjoy the proximity of the water. The diversity of plant species provides visual interest and increases aesthetic appeal.

2. Recommended buffer widths

The width of a buffer depends greatly on what resource you are trying to protect. Scientific studies have shown that efficient buffer widths range from 10 feet for bank stabilization and stream shading, to over 300 feet for wildlife habitat. Furthermore, the necessary width for an individual site may be less or more than the average recommendations, depending on soil type, slope, land use and other factors. The ranges cited below come from four literature reviews by The U.S. Army Corps of Engineers New England Division, the University of Georgia's Institute of Ecology, the U.S. Army Engineer Research and Development Center, and researchers from the UK Forestry Commission.[7] Results from studies done in New England fall within the ranges cited below, and no evidence was found in the literature to suggest that buffers should be, on average, either wider or narrower.

a. Erosion control

Erodibility of soil type is a key factor when assessing adequate buffer widths. Widths for effective sediment removal vary from only a few feet in relatively well drained flat areas to as much as several hundred feet in steeper areas with more impermeable soils. In order to prevent most erosion, vegetated buffers of 30 feet to 98 feet have been shown to be effective.

b. Water quality

Nutrients - Nitrogen and phosphorous can be retained in buffers that range from 16 to 164 feet. The wider buffers will be able to provide longer-term storage. Nitrogen is more effectively removed than phosphorous. In 1995, a study conducted in Maine found that the effectiveness of buffers at removing phosphorous is variable but in most cases, a 49-foot natural, undisturbed buffer was effective at removing a majority of the nutrient from surface runoff. However, the U.S. Army Corps of Engineers concluded in their 1991 study that there was insufficient evidence

[7] U.S. Army Corps of Engineers 1991, Wenger 1999, Fischer and Fischenich 2000, Broadmeadow and Nisbet 2004, respectively.

to determine a necessary buffer width for phosphorous retention. It is important, therefore, to combine buffer zones with strategies to reduce phosphorous at its source.

Pesticides – Buffer widths for pesticide removal range from 49 feet to 328 feet. Pesticides that are applied manually require less of a buffer area than aerially-sprayed pesticides.

Biocontaminants – Buffer widths for biocontaminants, such as fecal coliform, were not reviewed in this study. The University of Georgia found that, in general, buffers should be 30 ft. or greater. However, buffers may not be able to adequately filter biocontaminants and it is also important to reduce these pollutants at the source.

c. Aquatic habitat

Wildlife – The minimum width of riparian buffers to protect aquatic wildlife, including trout and invertebrates, range from 33 feet to 164 feet.

Litter and debris input – Recommendations for buffer widths to provide an adequate amount of debris for stream habitat range from 10 feet to 328 feet, although most fall within 50 feet to 100 feet.

Stream temperature. Adequate shading can be provided by a 30-foot buffer, but buffers may need to be up to 230 feet to completely control stream temperature. The amount of shade required is related to the size of the channel. The type of vegetation in the buffer regulates the amount of sunlight reaching the stream channel. Generally, a buffer that maintains 50% of direct sunlight and the rest in dapple shade is considered preferable[8]

d. Terrestrial habitat

The Eightmile River watershed contains a large number of roadless, undeveloped forest blocks and is more than 80% forested in total. Furthermore, the riparian corridor within 300 ft. of the river and its tributaries has remained mostly intact, supporting a high level of biodiversity as well as protecting water quality. The Eightmile River is host to a number of important species, including native brook trout, freshwater mussels, blue back herring, bobcats, great horned owls and cerulean warblers.

The habitat requirements for birds, mammals, reptiles, amphibians and fish vary widely, and the necessary buffer width to protect each species varies widely as well. While trout and salmon can benefit greatly from the shading, habitat, food, and water quality protection that a 150-foot buffer provides, mammals such as the red fox and the bobcat require riparian corridors of approximately 330 feet. Furthermore, birds such as the cerulean warbler, which requires large areas of forest, may need a buffer that is much greater than 330 ft.[9] For this reason, we do not believe that it is feasible to capture all of the habitat needs of all species with a uniform buffer. More careful targeting of potential riparian habitat, work with landowners to create conservation

[8] Broadmeadow and Nisbet 2004
[9] Chase et al. 1995

easements, as well as the creation of protected areas by the town will aid in more specific approaches to habitat preservation for these species.

For a more detailed look at the range of recommended buffer widths, see Appendix 1.

3. Factors influencing buffer width

There are many factors that influence the effectiveness buffers. These include slope, rainfall, the rate at which water can be absorbed into the soil, type of vegetation in the buffer, the amount of impervious surfaces, and other characteristics specific to the site.

a. Slope

As slope increases, the speed at which water flows over and through the buffer increases. Therefore, the steeper the land within the buffer, the wider it needs to be to have time to slow the flow of water and absorb the pollutants and sediments within it. Many researchers suggest that especially steep slopes serve little value as a buffer, and recommend excluding areas of steep slope when calculating buffer width. The definition of "steep" varies from over 10% to over 40% slope[10].

b. Soil type

The type of soil affects how quickly water can be absorbed. Soils that are high in clay are less permeable and may have greater runoff. On the other hand, soils that are largely made up of sand may drain water so rapidly into the groundwater that roots are not able to effectively trap pollutants. Furthermore, soils that are moister and more acidic have a better capacity to take up nitrogen from the soil and release it to the atmosphere (through denitrification).

c. Vegetation mix

Structurally diverse riparian buffers, i.e. those that contain a mix of trees, shrubs and grasses, are much more effective at capturing a wide range of pollutants than a riparian buffer that is solely trees or grass. Removal efficiencies range from 61% of the nitrate, 72% of the total phosphorous and 44% of the orthophosphates from grass buffers to 92% of the nitrate 93% of the total phosphorous and 85% of the orthophosphates from combined grass and woody buffers. [11]

[10] Wenger 1999
[11] Jontos 2004

Table 1: Estimated reduction of nutrient loads from implementation of riparian buffers[12]

Buffer Type	Nitrogen	Phosphorus	Sediment
Forested	48-74%	36-70%	70-90%
Vegetated Filter Strips	4-70%	24-85%	53-97%
Forested and Vegetated Filter Strips	75-95%	73-79%	92-96%

Source: Delaware Department of Natural Resources and Environmental Control

Generally, the grass filter strip works best for sediment removal, while the forested buffer is better for nitrate removal from subsurface flows[13]. Grasses have a shallower and denser root mat that is more effective in slowing runoff and trapping sediments from the surface flow. Trees have a deeper root system that can trap and uptake nutrients from the groundwater, stabilize banks, and regulate the flow of water to the stream.

Forests provide certain functions that grasses cannot. Trees shade the river and provide an input of leaf litter and branches that are necessary for many aquatic species. In addition, a forested buffer provides important habitat for terrestrial wildlife. Native plants species are preferred to ornamentals or exotics due to the habitat advantage they provide for wildlife. Old trees are especially valuable for providing inputs of coarse woody debris.

The most effective riparian buffers should include a mix of trees, shrubs and herbaceous plants native to the region and appropriate to the environment in which they are to be planted. When planting buffers, it is best to use adjacent reference riparian buffers as the basis for selecting floral composition[14].

Table 2: Plant type vs. removal efficiency

Function	Grass	Shrubs	Trees
Sediment trapping	High	Medium	Low
Filtration of Sediment born Nutrients, Microbe and Pesticides	High	Low	Low
Soluble forms of Nutrients and Pesticides	Medium	Low	Medium
Flood Conveyance	High	Low	Low
Reduce Stream Bank Erosion	Medium	High	High

Source: Jontos 2004 (modified after Fisher and Fischenich 2000)

[12] (Palace, 1998; Lowrance et al., 1995; Franti, T.G., (1997); Parsons et al. (1994); Gilliam et al. (1997); Osmond et al., (2000)
[13] Triangle J. Council of Governments 1999
[14] Jontos 2004

4. Buffer types

a. Variable Width

Several models have been created to consider individual site factors in determining buffer width. These range from the complex to the relatively simple. The more complex models take into account multiple factors, such as slope, erodibility and infiltration rates[15]. Examples of such models include:

Brown et al. (1987):

$$\textit{Buffer width} = (\textit{average slope/erodibility factor})^{1/2}$$

Cook College Department of Environmental Resources:

$$\textit{Buffer width} = 2.5\ (\textit{time of travel of overland flow}) * (\textit{slope})^{0.5}$$

More simple models only take into account slope. A common formula is to set a fixed buffer width and apply 2 feet per percent slope. Many of these models recommend *not* including impervious surfaces or areas of steep slope in the buffer width (**Figure 1**). Cook College recommends excluding anything greater than 15% slope, while Wenger (1999) recommends excluding all slopes over 25%.

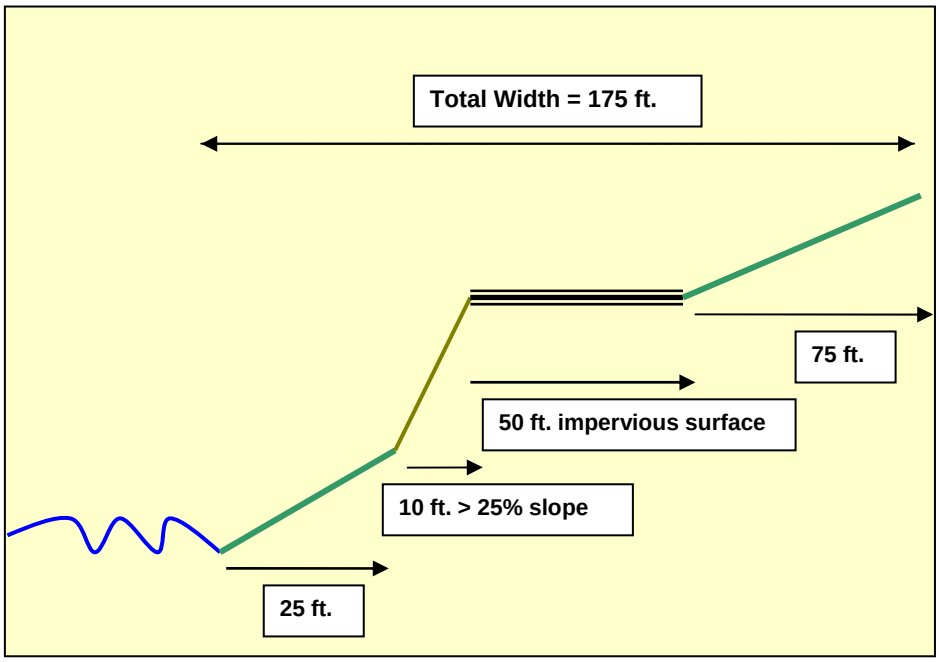
b. Fixed Width

A fixed buffer width is the easiest to administer. However, care must be taken to select the appropriate width for the resources you are targeting. Studies unanimously support the conclusion that buffer efficiency at filtering out pollutants increases with width. However, this does not increase infinitely, and the goal is to find the most efficient width. For example, a study in the Mid-Atlantic[16] found that 90% of sediments were removed by a 62 ft. riparian buffer, but only 94% were removed by more than doubling the buffer width to 164 ft

If a fixed buffer width is chosen, it should be on the conservative side to provide leeway for slope and soil type. Data for the Eightmile River watershed show that significant areas of the land bordering the river have slopes that are above 15%. Therefore, we believe it is necessary to make a fixed buffer width wider than the average minimum recommendation of 100 ft.

[15] Described in the US Army Corps of Engineers (1991) literature review.
[16] Peterjohn and Corell 1994.

Fig.1: Variable buffer width adjusted from 100 feet to 175 feet to account for effects of slope and impervious surface.



c. Three Zone

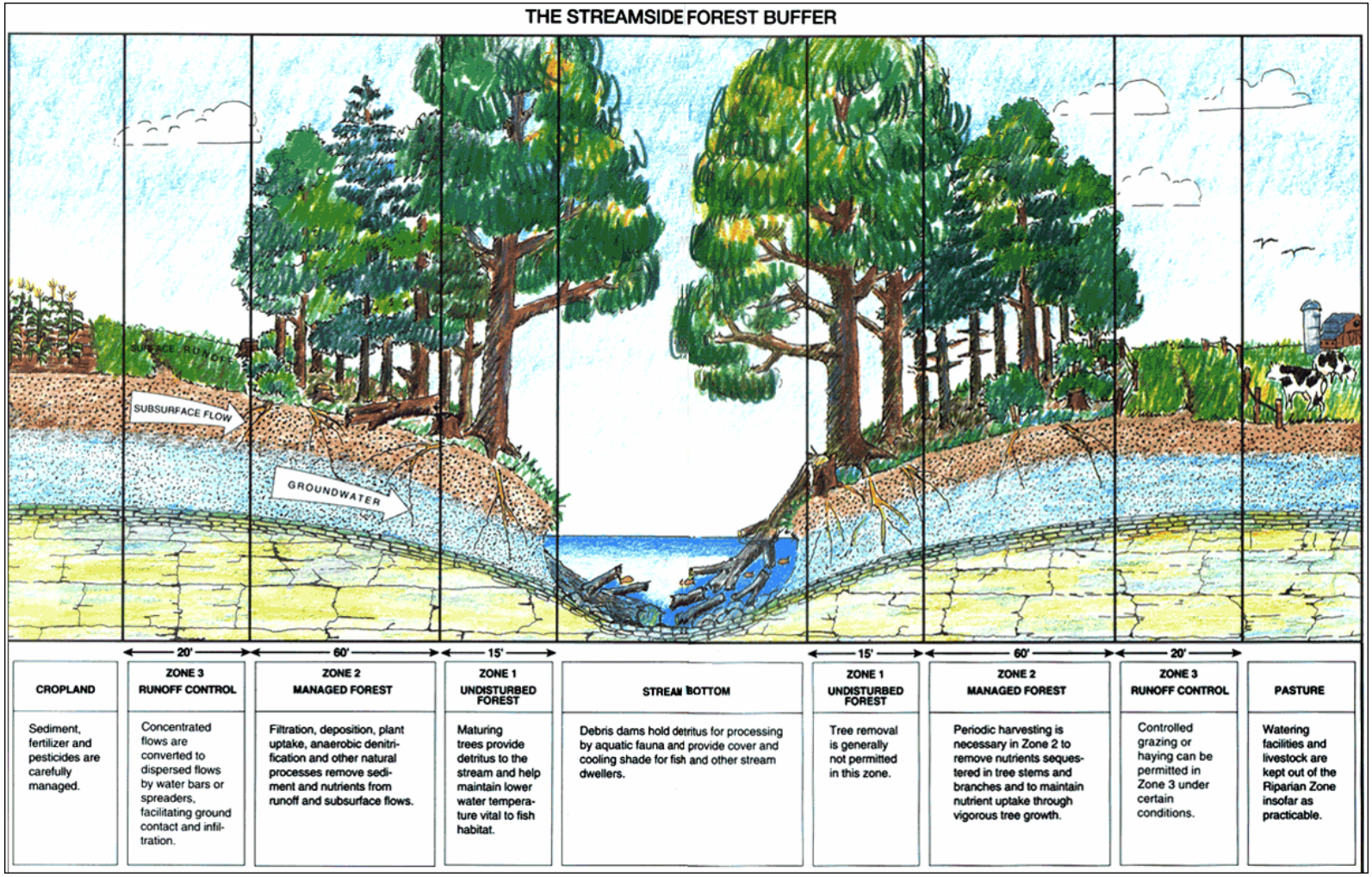
The Three Zone system was originally developed as part of an initiative to protect the Chesapeake Bay. The combination of vegetation types (trees, grass and shrubs) helps maximize the efficiency and diversity of benefits that the buffer provides (Figure 2).

Zone 1
Minimum Width: 15 ft.
Composition: Native trees and shrubs
Function: Bank stabilization, habitat, shade, flood prevention
Management: None allowed except bank stabilization and removal of problem vegetation.

Zone 2
Minimum Width: 60 ft.
Composition: Native trees and shrubs.
Function: Removal of nutrient, sediments and pollutants from surface and groundwater, habitat
Management: Some removal of trees to maintain vigorous growth.

Zone 3
Minimum Width: 30 ft.
Composition: Grasses and herbaceous plants
Function: Slow surface runoff, trap sediments and pesticides
Management: Mowing

Fig. 2: **Three-Zone System**



Source: Welsch 1991. Riparian Forest Buffers: Function and Design For Protection and Enhancement of Water Resources.

5. What order streams to protect

Buffers are most effective when they are contiguous. Guidelines for buffer widths recommend that long, continuous buffer strips should often be a higher priority than fragmented strips of greater width.[17] Small gaps in vegetation along the bank can channelize runoff into the river and effectively negate the effect of surrounding buffers. For this reason, landowners who currently have lawns that run to the edge of the river should be encouraged to replant trees and shrubs along the bank. In addition, footpaths cleared for river access should be winding, rather than straight, and as narrow as possible to minimize sedimentation.

Failure to extend protection to the smaller headwater streams in the river basin also ignores important sources of sedimentation and pollution. To preserve water quality in the Eightmile River, it is essential to protect all of its tributaries. In fact, smaller order streams often account for the greatest miles of watercourse in a basin. Buffering low order streams (1^{st}, 2^{nd} and 3^{rd}) has greater positive influence on water quality than wider buffers on portions of larger order streams already carrying polluted water. While it may be politically infeasible to set wide buffer zones around intermittent and ephemeral streams, this omission is not justified by the science. A University of Georgia study of riparian buffers warns, "Governments that do not apply buffers to certain classes of streams should be aware that such exemptions reduce benefits substantially."[18] A review of buffers by the U.S. Army also notes that "even the best buffer strips along larger rivers and streams cannot significantly improve water that has been degraded by improper buffer practices higher in the watershed".[19]

Smaller headwater streams have the greatest area of land-water interaction, and have the greatest potential to accept and transport sediment. Ephemeral streams, which only exist during periods of high rain, can serve as important sources of sediment and pollutants to the river. It is important that they are maintained in a vegetated condition in order to help trap and slow the flow of pollutants. Furthermore, removing riparian vegetation from the banks of small, heavily shaded streams will have a much greater impact on stream temperature and aquatic habitat throughout the watershed than removing vegetation from larger rivers, where only a fraction of the water is shaded. Rather than ignoring these streams completely, a compromise would be to create a smaller setback. Clinnick et al (1985) advocate a minimum of a 20 m wide buffer for ephemeral streams, and where that is not possible, at least leaving the banks vegetated[20].

[17] Fisher and Fischenich 2000
[18] Wenger 1999
[19] Fisher and Fishenich 2000
[20] Wenger 1999

Appendix 1–Summary of Effective Buffer Widths from Literature Review

	Effective Width of Buffer (in feet)							
Author	**Aquatic Wildlife**	**Terrestrial Wildlife**	**Stream Temperature**	**Litter/Debris input**	**Nutrient Retention**	**Sediment Control**	**Bank Stabilization**	**Pesticide Retention**
Wenger 1999		220-574 ft.	33 – 98 ft.	50 ft.	50 – 100 ft.	82 – 328 ft.	–	> 49 ft.
Army Corps 1991	98 ft.	30 – 656 ft.	33 – 66 ft.	66-102 ft.	52 – 164 ft.	33 – 148 ft.	49 – 98 ft.	49 – 328 ft.
Fisher and Fischenich 2000	> 98 ft.	98-1,640 ft.	–	10 – 33 ft.	16.4-98 ft.	30-200 ft.	30 -66 ft.	–
Broadmeadow and Nisbet 2004	33 –164 ft.	–	49 – 230 ft.	82 – 328 ft.	16.4-98 ft.	49 – 213 ft.	–	–

Appendix 2 - General Recommended Widths of Buffer Zones

Source: Jontos 2004 (modified after Fisher and Fischenich 2000)

Function		**Recommended Width**
Water Quality Protection	Buffers, especially dense grassy or herbaceous buffers on gradual slopes, intercept overland runoff, trap sediments, remove pollutants, and promote ground water recharge. For low to moderate slopes, most filtering occurs within the first 10 m, but greater widths are necessary for steeper slopes, buffers comprised of mainly shrubs and trees, where soils have low permeability, or where NPS loads are particularly high.	5 to 30 m
Stream Stabilization	Buffers, particularly diverse stands of shrubs and trees, provide food and shelter for a wide variety of riparian and aquatic wildlife	10 to 20 m
Riparian Habitat	Riparian vegetation moderates soil moisture conditions in stream banks, and roots provide tensile strength to the soil matrix, enhancing bank stability. Good erosion control may only require that the width of the bank be protected, unless there is active bank erosion, which will require a wider buffer. Excessive bank erosion may require additional bioengineering techniques.	30 to 500 m +
Flood Attenuation	Riparian buffers promote floodplain storage due to backwater effects, they intercept overland flow and increase travel time, resulting in reduced flood peaks.	20 to 150 m
Detrital Input	Leaves, twigs and branches that fall from riparian forest canopies into the stream are an important source of nutrients and habitat.	3 to 10 m

Appendix 3

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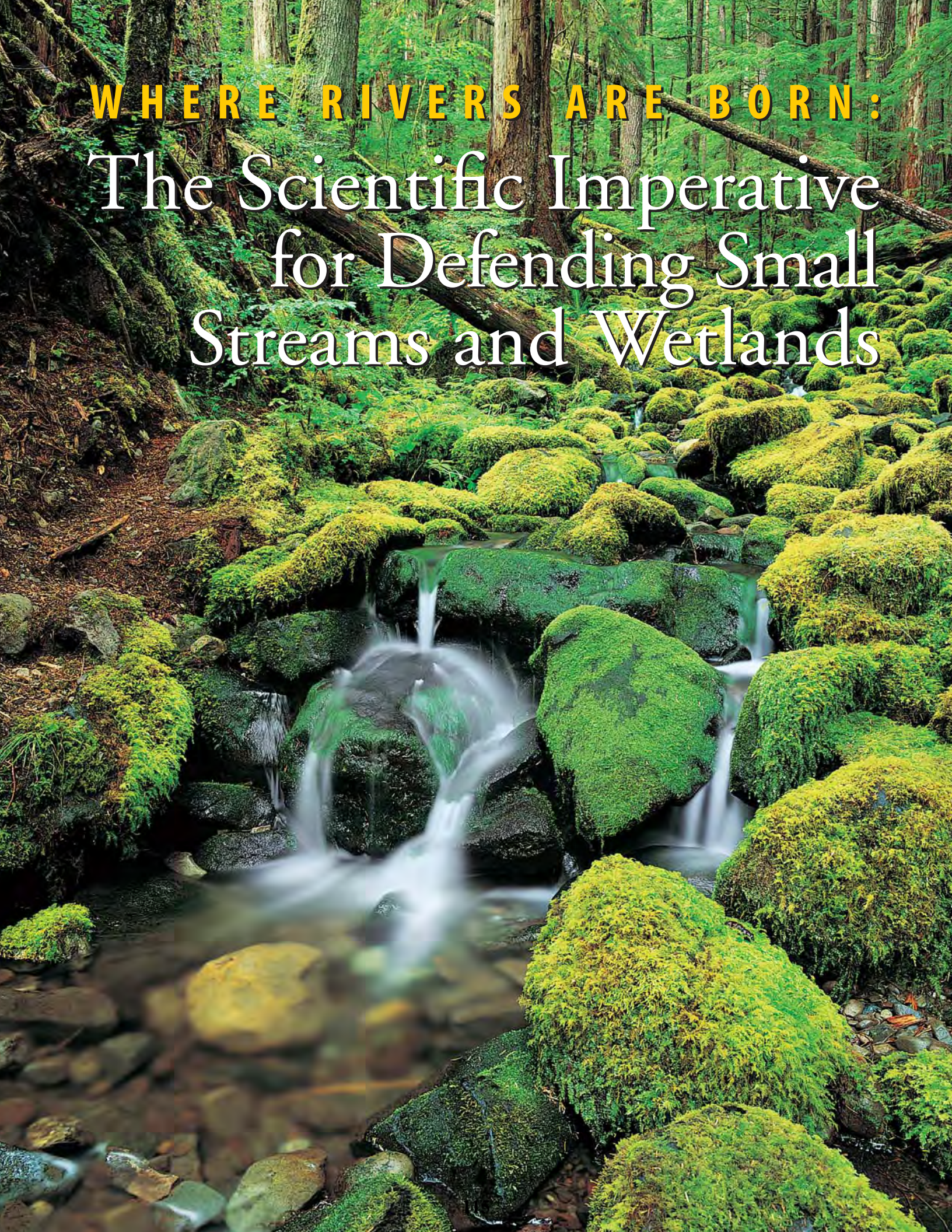
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TOWN OF VICTOR NRI – APPENDIX E
WHERE RIVERS ARE BORN

Appendix E
Where Rivers Are Born

Note: For more information on water resource protection, see:
http://www.stroudcenter.org/research/PDF/ProtectingHeadwaters.pdf



WHERE RIVERS ARE BORN:

The Scientific Imperative for Defending Small Streams and Wetlands

WHERE RIVERS ARE BORN:

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February, 2007

WHERE RIVERS ARE BORN:

The Scientific Imperative for Defending Small Streams and Wetlands

EXECUTIVE SUMMARY

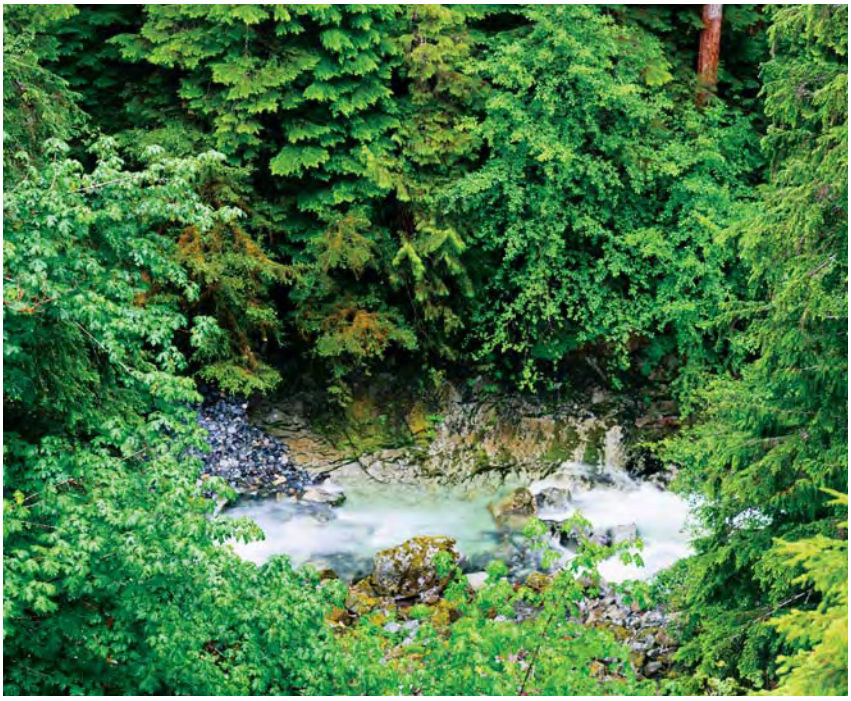
Our nation's network of rivers, lakes, and streams originates from a myriad of small streams and wetlands, many so small they do not appear on any map. Yet these headwater streams and wetlands exert critical influences on the character and quality of downstream waters. The natural processes that occur in such headwater systems benefit humans by mitigating flooding, maintaining water quality and quantity, recycling nutrients, and providing habitat for plants and animals. This paper summarizes the scientific basis for understanding that the health and productivity of rivers and lakes depends upon intact small streams and wetlands. Since the initial publication of this document in 2003, scientific support for the importance of small streams and wetlands has only increased. Both new research findings and special issues of peer reviewed scientific journals have further established the connections between headwater streams and wetlands and downstream ecosystems. Selected references are provided at the end of the document.

Historically, federal agencies, in their regulations, have interpreted the protections of the Clean Water Act to broadly cover waters of the United States, including many small streams and wetlands. Despite this, many of these ecosystems have been destroyed by agriculture, mining, development, and other human activities. Since 2001, court rulings and administrative actions have called into question the extent to which small streams and wetlands remain under the protection of the Clean Water Act. Federal agencies, Congress, and the Supreme Court have all weighed in on this issue. Most recently, the Supreme Court issued a confusing and fractured opinion that leaves small streams and wetlands vulnerable to pollution and destruction.



We know from local/regional studies that small, or headwater, streams make up at least 80 percent of the nation's stream network. However, scientists' abilities to extend these local and regional studies to provide a national perspective are hindered by the absence of a comprehensive database that catalogs the full extent of streams in the United States. The topographic maps most commonly used to trace stream networks do not show most of the nation's headwater streams and wetlands. Thus, such maps do not provide detailed enough information to serve as a basis for stream protection and management.

Scientists often refer to the benefits humans receive from the natural functioning of ecosystems as ecosystem services. The special physical and biological characteristics of intact small streams and wetlands provide natural flood control, recharge groundwater, trap sediments and pollution from fertilizers, recycle nutrients, create and maintain biological diversity, and sustain the biological productivity of downstream rivers, lakes, and estuaries. These ecosystem services are provided by



seasonal as well as perennial streams and wetlands. Even when such systems have no visible overland connections to the stream network, small streams and wetlands are usually linked to the larger network through groundwater.

Small streams and wetlands offer an enormous array of habitats for plant, animal, and microbial life. Such small freshwater systems provide shelter, food, protection from predators, spawning sites and nursery areas, and travel corridors through the landscape. Many species depend on small streams and wetlands at some point in their life history. A recent literature review documents the significant contribution of headwater streams to biodiversity of entire river networks, showing that small headwater streams that do not appear on most maps support over 290 taxa, some of which are unique to headwaters. As an example, headwater streams are vital for maintaining many of America's fish species, including trout and salmon. Both perennial and seasonal streams and wetlands provide valuable habitat. Headwater streams and wetlands also provide a rich resource base that contributes to the productivity of both local food webs and those farther downstream. However, the unique and diverse biota of headwater systems is increasingly imperiled. Human-induced changes to such waters, including filling streams and wetlands, water pollution, and the introduction of exotic species can diminish the biological diversity of such small freshwater systems, thereby also affecting downstream rivers and streams.

Because small streams and wetlands are the source of the nation's fresh waters, changes that degrade these headwater systems affect streams, lakes, and rivers downstream. Land-use changes in the vicinity of small streams and wetlands can impair the natural functions of such headwater systems. Changes in surrounding vegetation, development that paves and hardens soil surfaces, and the total elimination of some small streams reduces the amount of rainwater, runoff, and snowmelt the stream network can absorb before flooding. The increased volume of water in small streams scours stream channels, changing them in a way that promotes further flooding. Such altered channels have bigger and more frequent floods. The altered channels are also less effective at recharging groundwater, trapping sediment, and recycling nutrients. As a result, downstream lakes and rivers have poorer water quality, less reliable water flows, and less diverse aquatic life. Algal blooms and fish kills can become more common, causing problems for commercial and sport fisheries. Recreational uses may be compromised. In addition, the excess sediment can be costly, requiring additional dredging to clear navigational channels and harbors and increasing water filtration costs for municipalities and industry.

The natural processes that occur in small streams and wetlands provide Americans with a host of benefits, including flood control, adequate high-quality water, and habitat for a variety of plants and animals. Scientific research shows that healthy headwater systems are critical to the healthy functioning of downstream streams, rivers, lakes, and estuaries. To provide the ecosystem services that sustain the health of our nation's waters, the hydrological, geological, and biological characteristics of small streams and wetlands require protection.

Introduction

Our nation's rivers, from the Shenandoah to the Sacramento, owe their very existence to the seemingly insignificant rivulets and seeps that scientists call headwater streams. Although 19th century explorers often searched for the headwaters of rivers, the birthplace of most rivers cannot be pinpointed. The origins of rivers are many anonymous tiny rills that can be straddled by a 10-year-old child, and no one trickle can reasonably be said to be "the" start of that river. Rather, rivers arise from a network of streamlets and wetlands whose waters join together above and below ground as they flow downstream. As other tributaries join them, creeks grow larger, eventually earning the title "river." The character of any river is shaped by the quality and type of the numerous tributaries that flow into it. Each of the tributaries is, in turn, the creation of the upstream waters that joined to form it.

The ultimate sources of a river often appear insignificant. They could be a drizzle of snowmelt that runs down a mountainside crease, a small spring-fed pond, or a depression in the ground that fills with water after every rain and overflows into the creek below. Such water sources, which scientists refer to as headwater streams and wetlands, are often unnamed and rarely appear on maps. Yet the health of these small streams and wetlands is critical to the health of the entire river network. The rivers and lakes downstream from degraded headwater streams and wetlands may have less consistent flow, nuisance algal growth, more frequent and/or higher floods, poorer water quality, and less diverse flora and fauna.

Historically, federal agencies, in their regulations, have interpreted the protections of the Clean Water Act to cover all the waters of the United States, including small streams and wetlands. More recently, federal agencies and the courts have examined whether such streams and wetlands merit protection. In January, 2003, the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers announced an "advance notice of proposed rulemaking" to solicit public comments on whether and how to exclude "isolated," intrastate, and non-navigable waters from the scope of the Clean Water Act. Many small streams and wetlands, including headwater streams, could fall into one or more of those categories. While the proposed rulemaking was withdrawn, the agencies meanwhile instructed their field staff not to enforce the law to protect such waters, sometimes requiring case-by-case approval from agency headquarters before enforcing the Act. The result of this policy guidance is that thousands of our nation's waters have been denied protections under the Clean Water Act.

More recently, the Supreme Court issued a splintered decision in two cases (*Rapanos* and *Carabell*) about the scope of the Clean Water Act that leaves small streams and wetlands vulnerable to further loss of protections. Although there is no majority support for diminishing the Clean Water Act's application to wetlands and streams, the Court's ruling creates additional uncertainty as to which waters remain protected. The ruling places a burden on the EPA and the Corps of Engineers to show that upstream waters have a "significant nexus" to downstream waters. The "case-by-case" analysis required creates extra layers of work to prove what we already know scientifically: water flows downstream and bodies of water are integrally connected with each other. There is great concern that this decision will lead to more confusion and legal challenges and a loss of protection for many of our nation's waters.

Small streams and wetlands provide crucial linkages between aquatic and terrestrial ecosystems and also between upstream watersheds and tributaries and the downstream rivers and lakes. Since the initial publication of this document in 2003, scientific research has continued to bolster the significance of these connections. Based on the most recent research, this paper summarizes the scientific basis of understanding how small streams and wetlands mitigate flooding, maintain water quality and quantity, recycle nutrients, create habitat for plants and animals, and provide other benefits.

"The River itself has no beginning or end. In its beginning, it is not yet the River; in its end, it is no longer the River. What we call the headwaters is only a selection from among the innumerable sources which flow together to compose it. At what point in its course does the Mississippi become what the Mississippi means?"

–T.S. Eliot







Top: Lake Joy Creek is an intermittent zero- and first-order tributary stream to the Snoqualmie River in the Puget Sound area of Washington. Photo courtesy of Washington Trout

Center: A primary headwater stream in arid Cienega Creek Preserve, Pima County. Photo courtesy of Arizona Game and Fish Division

Right: A primary headwater stream in Athens County, Ohio. Photo courtesy of Ohio EPA

Bottom: Diagram of stream orders within a stream system. Image created by Sierra Club, based on EPA graphic.

Human Beings Depend on Functioning Headwater Stream Systems

Human civilizations and economies are ultimately based on the products and processes of the natural world. While frequently hidden from view, some of the processes integral to the functioning of ecosystems - such as the purification of water and the processing of waste - are crucial to human well-being. Scientists often refer to the benefits humans receive from the functioning of natural ecosystems as *ecosystem services.*

The natural processes that occur in intact headwater streams and wetlands affect the quantity and quality of water and the timing of water availability in rivers, lakes, estuaries, and groundwater. For example, the upper reaches of stream networks are important for storing water, recharging groundwater, and reducing the intensity and frequency of floods. Stream and wetland ecosystems also process natural and human sources of nutrients, such as those found in leaves that fall into streams and those that may flow into creeks from agricultural fields. Some of this processing turns the nutrients into more biologically useful forms. Other aspects of the processing stores nutrients, thereby allowing their slow and steady release and preventing the kind of short-term glut of nutrients that can cause algal blooms in downstream rivers or lakes.

The Extent of U.S. Headwater Streams is Underestimated

For many people, *headwater stream* brings to mind a small, clear, icy-cold, heavily-shaded stream that tumbles down a steep, boulder-filled channel. Indeed, there are thousands of miles of such shaded, mountainous headwater streams in the United States. But the term "headwater" encompasses many other types of small streams. Headwaters can

TYPES OF STREAMS

Any one river typically has several different types of sources: perennial streams that flow year-round; *intermittent* streams that flow several months during the year, such as streams that come from snowmelt; and *ephemeral* streams that flow at the surface only periodically, usually in response to a specific rainstorm. All these types of streams can be the *headwaters* of a river.

One way scientists classify streams is the *stream order* system, which assigns streams a number depending upon their location in the network's branching pattern. The term *zero-order stream* refers to swales: hollows that lack distinct stream banks but still serve as important conduits of water, sediment, nutrients, and other materials during rainstorms and snowmelt. Such zero-order streams are integral parts of stream networks. *First-order streams* are the smallest distinct channels. The rivulet of water that flows from a hillside spring and forms a channel is a *first-order stream. Second-order streams* are formed when two first-order channels combine, *third-order streams* are formed by the combination of two second-order streams, and so on.



The term *headwaters* refers to the smallest streams in the network. Scientists often use the term headwaters to refer to zero-, first-, and second-order streams. Easily half of the total length of the channels in a stream network can be first-order streams. Such small headwater streams can join a river system at any point along the network. So, a fourth-order stream resulting from the upstream merger of many first-, second-, and third-order streams may flow through a forest and be joined by another first-order stream that meanders out of a nearby marshy meadow.

Sometimes resource managers define a stream based on the size of its watershed, the land area that drains into the stream. For example, Ohio's EPA defines headwater streams as those that drain an area 20 square miles or smaller. Such a definition includes first-, second-, and often third-order streams. Other managers suggest that headwater systems can be defined as those having watersheds of less than one square kilometer, a definition that would generally include only first- and second-order streams. For the purposes of this paper, we consider zero-, first-, and second-order streams as headwaters.

be intermittent streams that flow briefly when snow melts or after rain, but shrink in dry times to become individual pools filled with water. Desert headwater streams can arise from a spring and run above ground only a few hundred yards before disappearing into the sand. Other spring-fed headwaters contain clear water with steady temperature and flow. Yet other headwaters originate in marshy meadows filled with sluggish tea-colored water.

No comprehensive study has been conducted to catalog the full extent of streams in the United States. However, on the basis of available maps, scientists have estimated that these smallest streams, called first- and second-order streams, represent about three-quarters of the total length of stream and river channels in the United States. The actual proportion may be much higher because this estimate is based on the stream networks shown on the current U.S. Geological Survey (USGS) topographic maps, which do not show all headwater streams. The absence of a comprehensive survey of U.S. streams hinders our ability to estimate the nationwide importance of these systems; it also indicates our need to better understand them.

Studies including field surveys of stream channel networks have found far more headwater streams than are indicated on USGS topographic maps. For example, an on-the-ground survey of streams in the Chattooga River watershed in the southern Appalachian Mountains found thousands of streams not shown on USGS topographic maps. Approximately one-fifth or less of the actual stream network was shown on the USGS map. The missing streams were the smaller ones - the headwaters and other small streams and wetlands. Similar discrepancies have been found at the state level. For example, Ohio's Environmental Protection Agency found that the state's primary headwater streams, although generally absent from USGS topographic maps, comprise more than 80 percent of the total length of the state's streams. Even when small streams are on the map, they are sometimes misclassified: a large number of Ohio streams shown as intermittent on topographic maps are actually perennial.

Intact stream networks contain streams that flow year-round and others that flow only part of the time. Compared with the humid-region examples above, stream and river networks in arid regions have a higher proportion of channels that flow intermittently. For example, in Arizona, most of the stream networks - 96 percent by length - are classified as ephemeral or intermittent.

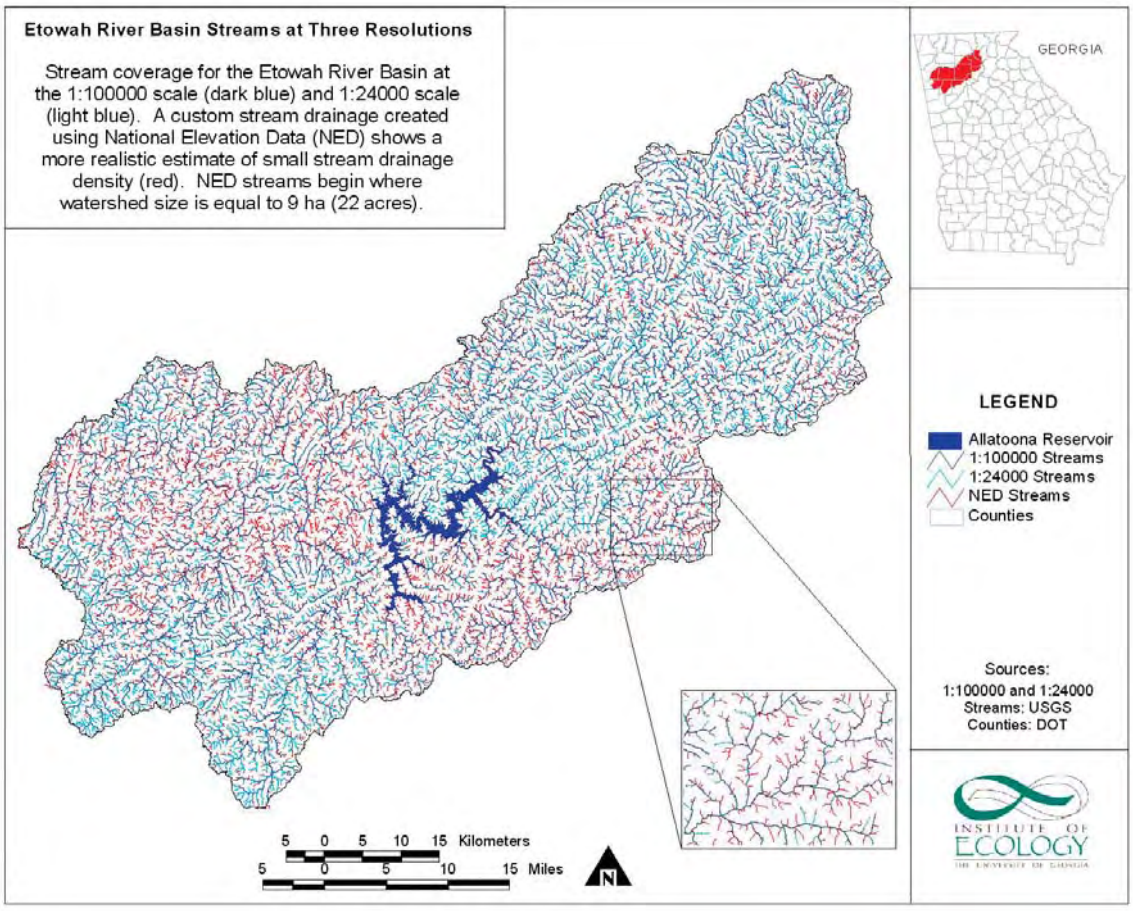
Thus, regional calculations on the extent of small streams grounded in solid evidence show these streams to be underestimated by existing inventories and maps. But actual measurements are not available for the whole nation. Moreover, the topographic maps commonly used as catalogues of stream networks are not detailed enough to serve as a basis for stream management and protection. The very foundation of our nation's great rivers is a vast network of unknown, unnamed, and underappreciated headwater streams.





Top: Sycamore Creek in Arizona, an arid stream during a dry period. Photo Courtesy of Nancy Grimm

Center: Sycamore Creek (the same stream) after a winter storm. Photo Courtesy of Nancy Grimm



Existing tools for cataloging U.S. waters generally omit a large proportion of the headwaters. In this illustration of Georgia's Etowah River Basin, National Elevation Data details, in red, the approximately 40 percent and 60 percent of headwaters not captured by standard cataloging methods. Diagram courtesy of B.J. Freeman, University of Georgia.

Small Streams Provide Greatest Connection Between Water and Land

Within any intact stream and river network, headwater streams make up most of the total channel length. Therefore, such small streams offer the greatest opportunity for exchange between the water and the terrestrial environment. Small streams link land and water in several ways. As a stream flows, it links upstream and downstream portions of the network. In addition, water flows out of and into a channel during events such as floods and runoff from rainstorms. Floodwaters and runoff carry various materials, ranging from insects and bits of soil to downed trees, between land and a channel. Much exchange between land and water occurs in the transition zone along edges of stream channels, called the *riparian zone*.

Water and land also meet in saturated sediments beneath and beside a river channel, a region which scientists call the *hyporheic zone*. Stream water flows within the stream channel and the hyporheic zone. It is in this zone, where stream water makes its most intimate contact with the channel bed and banks that much of a stream's cleansing action and nutrient processing occurs. This zone is also where groundwater and surface water come into contact.

Ecological processes that occur in hyporheic zones have strong effects on stream water quality. Rivers with extensive hyporheic zones retain and process nutrients efficiently, which has a positive effect on water quality and on the ecology of the riparian zone. Scientific research is illuminating the importance of maintaining connectivity between the channel, hyporheic, and riparian components of river ecosystems. When human actions, such as encasing streams in pipes, sever those connections, the result is poorer water quality and degraded fish habitat downstream.

Wetlands Have Hidden Connections to Streams

Like headwater streams, wetlands are also key components of the nation's network of rivers and streams. Many wetlands, such as marshes that border lakes or streams, have obvious connections to surface waters. Other wetlands, however, seem cut off from stream networks - but that appearance is deceiving. Recent research further documents that even wetlands that are referred to as "isolated" are not isolated at all, but have both hydrologic and biologic linkages to regional aquatic systems, and thus are referred to as "geographically isolated" and remain significantly related.

Wetlands are almost always linked to stream networks and other wetlands through groundwater. The hydrologic linkage depends upon the rate at which groundwater moves; water seeping into a gravel aquifer can travel miles in a year, but water seeping into silt or clay may travel only several feet in a year. There are strong biological connections also; many aquatic and semi-aquatic animals, ranging in size from aquatic insects to raccoons, routinely move between land-locked wetlands, streamside wetlands, and stream channels. Animals often use different parts of the aquatic environment at different points in their life cycle, so groundwater connections and food webs link many wetlands to larger waterways. Maintenance of biological diversity in wetlands is dependent on both the terrestrial periphery of the wetland and the corridors that connect geographically isolated wetlands. A recent survey found that 274 at-risk plant and animal species are supported by geographically isolated wetlands.

Evaluating these "hidden" connections that exist between wetlands and regional aquatic ecosystems requires an assessment of groundwater travel time, frequency with which wetlands are connected to surface waters, and home ranges of species that require both wetlands and surface waters.

A U.S. Fish and Wildlife Service study of wetlands in 72 areas within the United States found that wetlands without obvious surface connections to waterways are generally small in area, but numerous. All such wetlands are depressions in the ground that hold water, whether from rainwater, snowmelt, or groundwater welling up to the surface. Each region of the United States has unique types of depressional wetlands. Ephemeral wetlands called vernal pools occur in California and the Northeast; the prairie potholes beloved by ducks and other waterfowl dot the Upper Midwest; and Carolina bays, cypress ponds, and grass-sedge marshes occur in the Southeast.





Top: A vernal pool in Massachusett's Ipswich River Basin during the dry phase in summer. Photo courtesy of Vernal Pool Association

Bottom: The same Ipswich River Basin vernal pool inundated by fall precipitation. Photo courtesy of Vernal Pool Association

Small Streams and Wetlands Provide Beneficial Ecosystem Services



A headwater stream channel near Toledo, OH relocated to accommodate development. Photo courtesy of Marshal A. Moser

Natural processes that occur in small streams and wetlands provide humans with a host of benefits, including flood control, maintenance of water quantity and quality, and habitat for a variety of plants and animals. For headwater streams and wetlands to provide ecosystem services that sustain the health of our nation's waters, the hydrological, geological, and biological components of stream networks must be intact.

Small Streams and Wetlands Provide Natural Flood Control

Floods are a natural part of every river. In times past, waters of the Mississippi River routinely overtopped its banks. Floodwaters carried the sediment and nutrients that made the Mississippi Delta's soil particularly suitable for agriculture. But floods can also destroy farms, houses, roads, and bridges.

When small streams and wetlands are in their natural state, they absorb significant amounts of rainwater, runoff, and snowmelt before flooding. However, when a landscape is altered, such as by a landslide or large forest fire or a housing development, the runoff can exceed the absorption capacity of small streams. Moreover, the power of additional water coursing through a channel can change the channel itself. Humans often alter both landscape and stream channels in ways that result in larger and more frequent floods downstream.

A key feature of streams and rivers is their shape. Unlike a concrete drainage ditch, a natural streambed does not present a smooth surface for water flow. Natural streambeds are rough and bumpy in ways that slow the passage of water. Particularly in small narrow streams, friction produced by a stream's gravel bed, rocks, and dams of leaf litter and twigs slows water as it moves downstream. Slower moving water is more likely to seep into a stream's natural water storage system-its bed and banks-and to recharge groundwater. Slower moving water also has less power to erode stream banks and carry sediment and debris downstream.

In watersheds that are not carefully protected against impacts of land development, stream channels often become enlarged and incised from increased runoff. Changed channels send water downstream more quickly, resulting in more flooding. For example, after forests and prairies in Wisconsin watersheds were converted to agricultural fields, the size of floods increased. This change in land use had altered two parts of the river systems' equation: the amount of runoff and shape of the stream channel. Cultivation destroyed the soil's natural air spaces that came from worm burrows and plant roots. The resulting collapse of the soil caused more rainfall to run off into streams instead of soaking into the ground. Additional surface runoff then altered the stream channels, thereby increasing their capacity to carry large volumes of water quickly downstream. These larger volumes flow downstream at much higher velocity, rather than soaking into the streambed.

Urbanization has similar effects; paving previously-vegetated areas leads to greater storm runoff, which changes urban stream channels and ultimately sends water more quickly downstream. Covering the land with impermeable surfaces, such as roofs, roads, and parking lots, can increase by several times the amount of runoff from a rainstorm. If land uses change near headwater streams, effects are felt throughout the stream network. In an urban setting, runoff is channeled into storm sewers, which then rapidly discharge large volumes of water into nearby streams. The additional water causes the stream to pick up speed, because deeper water has less friction with the streambed. The faster the water moves, the

less it can soak into the streambed and banks. Faster water also erodes channel banks and beds, changing the shape of a channel. The effect is magnified downstream, because larger rivers receive water from tens, sometimes hundreds, of small headwater basins. When such changes are made near headwater streams, downstream portions of the stream network experience bigger and more frequent flooding.

As regions become more urbanized, humans intentionally alter many natural stream channels by replacing them with storm sewers and other artificial conduits. When larger, smoother conduits are substituted for narrow, rough-bottomed natural stream channels, flood frequency increases downstream. For example, three decades of growth in storm sewers and paved surfaces around Watts Branch Creek, Maryland more than tripled the number of floods and increased average annual flood size by 23 percent.

"Alteration of small streams and wetlands disrupts the quantity and availability of water in a stream and river system."

Small Streams and Wetlands Maintain Water Supplies

Headwater systems play a crucial role in ensuring a continual flow of water to downstream freshwater ecosystems, and USGS models show that headwater streams in the northeastern U.S. contribute 55 percent of mean annual water volume to fourth- and higher-order streams and rivers. Water in streams and rivers comes from several sources: water held in the soil, runoff from precipitation, and groundwater. Water moves between the soil, streams and groundwater. Wetlands, even those without any obvious surface connection to streams, are also involved in such exchanges by storing and slowly releasing water into streams and groundwater, where it later resurfaces at springs. Because of these interactions, groundwater can contribute a significant portion of surface flow in streams and rivers; conversely, surface waters can also recharge groundwater. If connections between soil, water, surface waters, and groundwater are disrupted, streams, rivers, and wells can run dry. Two-thirds of Americans obtain their drinking water from a water system that uses surface water. The remaining one-third of the population relies on groundwater sources. The quality and amount of water in both of these sources respond to changes in headwater streams.

USGS estimates that, on average, 40 to 50 percent of water in streams and larger rivers comes from groundwater. In drier regions or during dry seasons, as much as 95 percent of a stream's flow may come from groundwater. Thus, the recharge process that occurs in unaltered headwater streams and wetlands both moderates downstream flooding in times of high water and maintains stream flow during dry seasons.

Headwater streams and wetlands have a particularly important role to play in recharge. These smallest upstream components of a river network have the largest surface area of soil in contact with available water, thereby providing the greatest opportunity for recharge of groundwater. Moreover, water level in headwater streams is often higher than the water table, allowing water to flow through the channel bed and banks into soil and groundwater. Such situations occur when water levels are high, such as during spring snowmelt or rainy seasons. During dry times, the situation in some reaches of the stream network, particularly those downstream, may reverse, with water flowing from the soil and groundwater through the channel banks and bed into the stream. This exchange of water from the soil and groundwater into the stream maintains stream flow. However, if land-use changes increase the amount of precipitation that runs off into a stream rather than soaking into the ground, the recharge process gets short-circuited. This increased volume of stream water flows rapidly downstream rather than infiltrating into soil and groundwater. The consequence is less overall groundwater recharge, which often results in less water in streams during drier seasons.

Therefore, alteration of small streams and wetlands disrupts the quantity and availability of water in a stream and river system. Protecting headwater streams and wetlands is important for maintaining water levels needed to support everything from fish to recreational boating to commercial ship traffic.

Small Streams and Wetlands Trap Excess Sediment

Headwater systems retain sediment. Like the flow of water, movement of sediment occurs throughout a river network. Thus, how a watershed is managed and what kinds of land uses occur there have substantial impact on the amount of sediment delivered to larger rivers downstream. Increased sediment raises water purification costs for municipal and industrial users, requires extensive dredging to maintain navigational channels, and degrades aquatic habitats. Intact headwater streams and wetlands can modulate the amount of sediment transported to downstream ecosystems.

Runoff from rain, snowmelt, and receding floodwaters can wash soil, leaves, and twigs into streams, where the various materials get broken up into smaller particles or settle out. If natural vegetation and soil cover are disturbed by events and activities such as fires, farming, or construction, runoff increases, washing more materials into streams. At the same time, the increased velocity and volume of water in a stream cause erosion within the streambed and banks themselves, contributing additional sediment to the stream system. Moreover, the faster, fuller stream can carry more and larger chunks of sediment further downstream.

"Intact headwater streams and wetlands can modulate the amount of sediment transported to downstream ecosystems."

One study found that land disturbances such as urban construction can, at minimum, double the amount of sediment entering headwater streams from a watershed. A Pennsylvania study showed how, as a 160-acre headwater watershed became more urbanized, channel erosion of a quarter-mile stretch of stream generated 50,000 additional cubic feet of sediment in one year-enough to fill 25 moderate-sized living rooms. In a non-urban watershed of the same size, it would take five years to generate the same amount of sediment. Such studies demonstrate that landscape changes such as urbanization or agriculture, particularly without careful protection of headwater streams and their riparian zones, may cause many times more sediment to travel downstream.

Excess Sediment in Downstream Ecosystems Costs Money

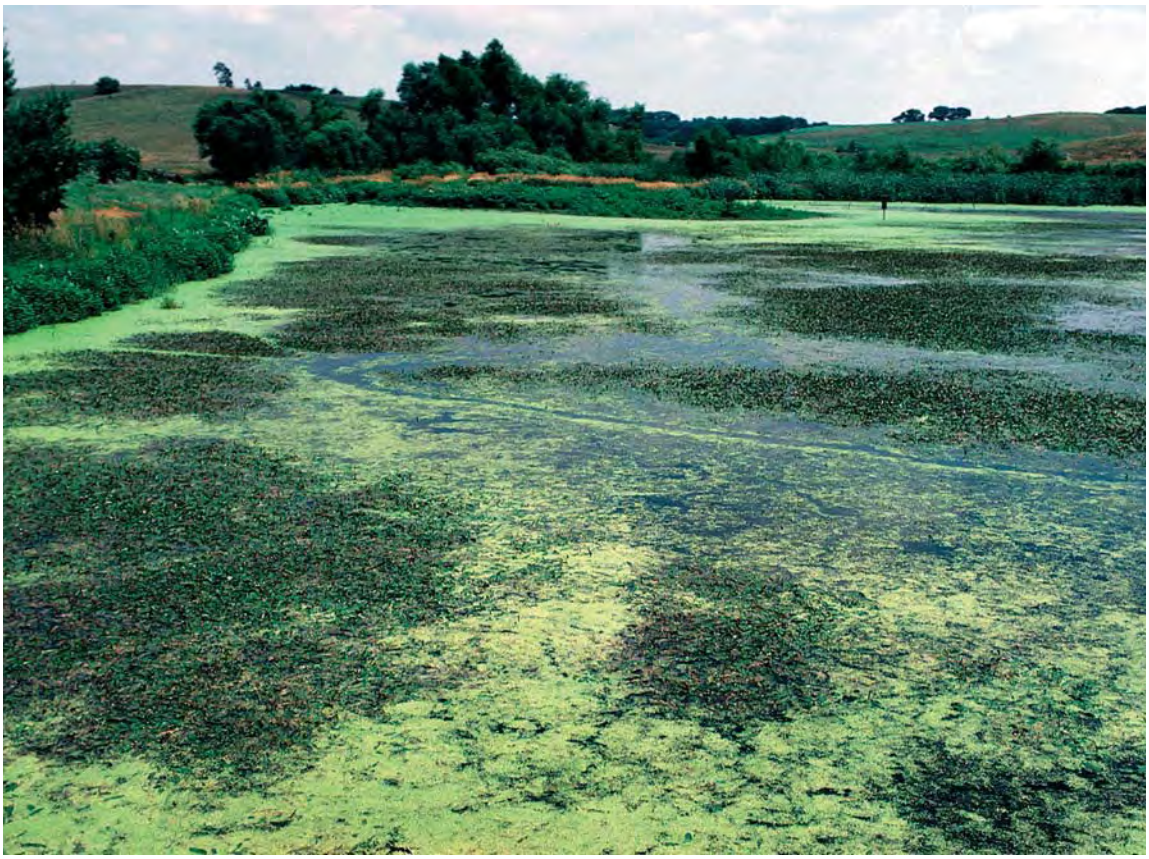
Keeping excess sediment out of downstream rivers and lakes is one ecosystem service intact small streams and wetlands provide. Once sediment moves further downstream, it becomes an expensive problem. Too much sediment can fill up reservoirs and navigation channels, damage commercial and sport fisheries, eliminate recreation spots, harm aquatic habitats and their associated plants and animals, and increase water filtration costs.

Additional sediment damages aquatic ecosystems. Sediment suspended in the water makes it murkier; as a result, underwater plants no longer receive enough light to grow. Fish that depend on visual signals to mate may be less likely to spawn in murky water, thereby reducing fish populations. High levels of sediment suspended in water can even cause fish kills. Even as it settles to the bottom, sediment continues to cause problems because it fills the holes between gravel and stones that some animals call home, smothers small organisms that form the basis of many food webs, and can also smother fish eggs.

Getting rid of sediment is expensive. For example, keeping Baltimore Harbor navigable costs $10 to $11.5 million annually to dredge and dispose of sediment the Patapsco River deposits in the harbor.

Small Streams and Wetlands Retain Sediment

Headwater streams and wetlands typically trap and retain much of the sediment that washes into them. The faster the water travels, the larger the particles it can carry. So, natural obstructions in small streams-rocks, downed logs, or even just a bumpy stream bottom-slow water and cause sediment to settle out of the water column. Wetlands, whether or not they have a surface connection to a nearby stream, are often areas where runoff slows and stops,



Stream networks filter and process everything from leaves and dead insects to runoff from agricultural fields and animal pastures. Without such processing, algal blooms can ruin living conditions for fish and the quality of drinking water. Here, algae overtakes a lake in Iowa. Photo courtesy of Lynn Betts, USDA NRCS

dropping any debris the water may be carrying. Because headwater streams represent 75 percent or more of total stream length in a stream network, such streams and their associated wetlands retain a substantial amount of sediment, preventing it from flowing into larger rivers downstream.

Even ephemeral streams can retain significant amounts of sediment. Such small headwater streams expand and contract in response to heavy rains. During expansion, a stream flows over what was a dry or damp streambed. Most of the water at the leading edge of a growing stream, called the "trickle front," soaks into the streambed and does not carry sediment downstream. In a small watershed near Corvallis, Oregon, researchers found that 60 to 80 percent of sediment generated from forest roads traveled less than 250 feet downstream before settling out in stream pools. Headwater streams can store sediment for long periods of time: research in Oregon's Rock Creek basin found that headwater streams could retain sediment for 114 years.

Natural Cleansing Ability of Small Streams and Wetlands Protects Water Quality

Materials that wash into streams include everything from soil, leaves, and dead insects to runoff from agricultural fields and animal pastures. One of the key ecosystem services that stream networks provide is the filtering and processing of such materials. Healthy aquatic ecosystems can transform natural materials like animal dung and chemicals such as fertilizers into less harmful substances. Small streams and their associated wetlands play a key role in both storing and modifying potential pollutants, ranging from chemical fertilizers to rotting salmon carcasses, in ways that maintain downstream water quality.

Excess Nutrients Cause Problems in Rivers and Lakes

Inorganic nitrogen and phosphorus, the main chemicals in agricultural fertilizers, are essential nutrients not just for plants, but for all living organisms. However, in excess or in the wrong proportions, these chemicals can harm natural systems and humans.

In freshwater ecosystems, eutrophication, the enriching of waters by excess nitrogen and phosphorus, reduces water quality in streams, lakes, estuaries, and other downstream waterbodies. One obvious result is the excessive growth of algae. More algae clouds previously clear streams, such as those favored by trout. In addition to reducing visibility, algal blooms reduce the amount of oxygen dissolved in the water, sometimes to a degree that causes fish kills. Fish are not the only organisms harmed: some of the algae species that grow in eutrophic waters generate tastes and odors or are toxic, a clear problem for stream systems that supply drinking water for municipalities. In addition, increased nitrogen can injure people and animals. Excess nitrogen in the form called nitrate in drinking water has been linked to "blue baby disease" (methemoglobinemia) in infants and also has toxic effects on livestock.

Headwater Streams Transform and Store Excess Nutrients

Headwater streams and associated wetlands both retain and transform excess nutrients, thereby preventing them from traveling downstream. Physical, chemical, and biological processes in headwater streams interact to provide this ecosystem service.

"If headwater streams and wetlands are degraded or filled, more fertilizer applied to farm fields or lawns reaches larger downstream rivers."

Compared with larger streams and rivers, small streams, especially shallow ones, have more water in physical contact with a stream channel, and thus nutrient particles are removed from the water column more quickly in small streams than in larger ones. New research on headwater streams has demonstrated that nitrate removed by headwater streams accounts for half of total nitrate removal in entire river basins. Removal of nitrate by headwater streams has reduced nitrogen export from watersheds in New England. The nutrients that are not removed in headwater streams travel far downstream because uptake processes are less efficient in larger systems. Similarly, a study of headwater streams in the Southern Appalachian Mountains found that both phosphorus and the nitrogen-containing compound ammonium traveled less than 65 feet downstream before being removed from the water

In headwater streams and wetlands, more water is in direct contact with the streambed, where most processing takes place. Bacteria, fungi and other microorganisms living on the bottom of a stream consume inorganic nitrogen and phosphorus and convert them into less harmful, more biologically beneficial compounds. A mathematical model based on research in 14 headwater streams throughout the U.S. shows that 64 percent of inorganic nitrogen entering a small stream is retained or transformed within 1,000 yards. The rest of the nitrogen is exported downstream, and models suggest that 40% of the nitrogen in waters downstream originated in headwaters.

Channel shape also plays a role in transforming excess nutrients. Studies in Pennsylvania have shown that when the forest surrounding headwaters is replaced by meadows or lawns, increased sunlight promotes growth of grasses along stream banks. The grasses trap sediments, create sod, and narrow the stream channel to one-third of the original width. Such narrowing reduces the amount of streambed available for microorganisms that process nutrients. As a result, nitrogen and phosphorus travel downstream five to ten times farther, increasing risks of eutrophication.

Streams do not have to flow year-round to make significant contributions to water quality. Fertilizers and other pollutants enter stream systems during storms and other times of high runoff, the same times that ephemeral and intermittent streams are most likely to have water and process nutrients. Federal, state and local programs spend considerable sums of money to reduce non-point source inputs of nutrients because they are a major threat to water quality. One principal federal program, the EPA's 319 cost-share program, awarded more than $1.3 bil-

lion between 1990 and 2001 to states and territories for projects to control non-point pollution. Failure to maintain nutrient removal capacity of ephemeral and intermittent streams and wetlands would undermine these efforts.

Wetlands also remove nutrients from surface waters. Several studies of riparian wetlands have found that those associated with the smallest streams to be most effective in removing nutrients from surface waters. For example, headwater wetlands comprise 45 percent of all wetlands able to improve water quality in four Vermont watersheds. Another study found that wetlands associated with first-order streams are responsible for 90 percent of wetland phosphorus removal in eight northeastern watersheds. Such studies demonstrate that riparian wetlands, especially those associated with small streams, protect water quality.

Even wetlands that are considered "isolated" are not isolated from a water quality perspective. Recent research has provided additional evidence of rapid removal of nitrate in small, headwater wetlands and concluded that headwater wetlands offer significant water quality benefits. Scientists have detailed the ecological functions and geographical distribution of "isolated" wetlands with an emphasis on their linkages with other aquatic ecosystems. Authors document that these wetlands are not truly isolated and use the term "geographically isolated wetlands" to describe wetlands that are surrounded by terrestrial habitat, but have both hydrologic and biologic linkages to regional aquatic systems that provide clean water benefits downstream.

As land is developed, headwater streams are often filled or channeled into pipes or paved waterways, resulting in fewer and shorter streams. For example, as the Rock Creek watershed in Maryland was urbanized, more than half of the stream channel network was eliminated. In even more dramatic fashion, mining operations in the mountains of central Appalachia have removed mountain tops and filled valleys, wiping out entire headwater stream networks. From 1986 to 1998, more than 900 miles of streams in central Appalachia were buried, more than half of them in West Virginia.

If headwater streams and wetlands are degraded or filled, more fertilizer applied to farm fields or lawns reaches larger downstream rivers. These larger rivers process excess nutrients from fertilizer much more slowly than smaller streams. Losing the nutrient retention capacity of headwater streams would cause downstream waterbodies to contain higher concentrations of nitrogen and phosphorus. A likely consequence of additional nutrients would be the contamination and eutrophication of downstream rivers, lakes, estuaries, and such waters as the Gulf of Mexico.

"The ability of headwater streams to transform organic matter into more usable forms helps maintain healthy downstream ecosystems."

Natural Recycling in Headwater Systems Sustains Downstream Ecosystems

Recycling organic carbon contained in the bodies of dead plants and animals is a crucial ecosystem service. Ecological processes that transform inorganic carbon into organic carbon and recycle organic carbon are the basis for every food web on the planet. In freshwater ecosystems, much of the recycling happens in small streams and wetlands, where microorganisms transform everything from leaf litter and downed logs to dead salamanders into food for other organisms in the aquatic food web, including mayflies, frogs, and salmon.

Like nitrogen and phosphorus, carbon is essential to life but can be harmful to freshwater ecosystems if it is present in excess or in the wrong chemical form. If all organic material received by headwater streams and wetlands went directly downstream, the glut of decomposing material could deplete oxygen in downstream rivers, thereby damaging and even killing fish and other aquatic life. The ability of headwater streams to transform organic matter into more usable forms helps maintain healthy downstream ecosystems.

Headwater Stream Systems Store and Transform Excess Organic Matter

Intact headwater systems both store and process organic matter in ways that modulate the release of carbon to downstream lakes and rivers. Headwater systems receive large amounts of organic matter, which can be retained and transformed into more palatable forms through decomposition processes. This organic matter is anything of biological origin that falls into, washes into, or dies in a stream. Plant parts, such as leaves, twigs, stems, and larger bits of woody debris are the most common of these items. Another source of organic material is dead stream organisms, such as bits of dead algae and bacteria or bodies of insects and even larger animals. Waste products of plants and animals also add organic carbon to water. Water leaches dissolved organic carbon from organic materials in a stream and watershed like tea from a tea bag.

Much of the organic matter that enters headwater systems remains there instead of continuing downstream. One reason is that the material often enters headwater streams as large pieces, such as leaves and woody debris that are not easily carried downstream. In addition, debris dams that accumulate in headwater streams block the passage of materials. One study found four times more organic matter on the bottoms of headwater streams in forested watersheds than on the bottoms of larger streams.

"Headwater streams are probably the most varied of all running-water habitats."

Another reason material stays in headwater streams is that food webs in small streams and wetlands process organic matter efficiently. Several studies have found that headwater streams are far more efficient at transforming organic matter than larger streams. For example, one study showed that, for a given length of stream, a headwater stream had an eightfold higher processing efficiency than a fourth-order channel downstream. Microorganisms in headwater stream systems use material such as leaf litter and other decomposing material for food and, in turn, become food for other organisms. For example, fungi that grow on leaf litter become nutritious food for invertebrates that make their homes on the bottom of a stream, including mayflies, stoneflies and caddis flies. These animals provide food for larger animals, including birds such as flycatchers and fish such as trout.

Headwater Systems Supply Food for Downstream Ecosystems

The organic carbon released by headwater streams provides key food resources for downstream ecosystems. Headwater ecosystems control the form, quality and timing of carbon supply downstream. Although organic matter often enters headwaters in large amounts, such as when leaves fall in autumn or storm runoff carries debris into the stream, those leaves and debris are processed more slowly. As a result, carbon is supplied to downstream food webs more evenly over a longer period of time. Forms of carbon delivered range from dissolved organic carbon that feeds microorganisms to the drifting insects such as mayflies and midges that make ideal fish food. Such insects are the preferred food of fish such as trout, char, and salmon. One study estimated that fishless headwater streams in Alaska export enough drifting insects and other invertebrates to support approximately half of the fish production in downstream waters.

Processed organic matter from headwater streams fuels aquatic food webs from the smallest streams to the ocean. Only about half of all first-order streams drain into second-order streams; the other half feed directly into larger streams or directly into estuaries and oceans, thus delivering their carbon directly to these larger ecosystems. The health and productivity of downstream ecosystems depends on processed organic carbon—ranging from dissolved organic carbon to particles of fungus, and leaf litter to mayflies and stoneflies-delivered by upstream headwater systems.

Headwater Streams Maintain Biological Diversity

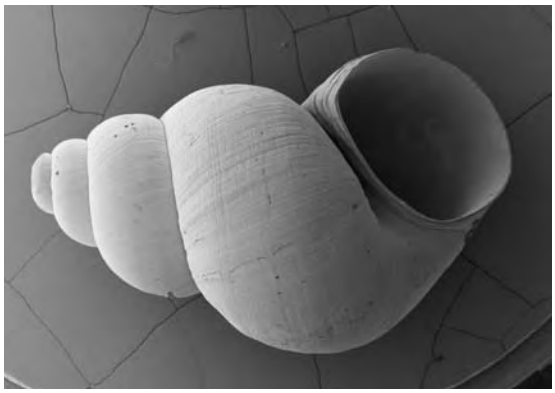
Headwater Habitats are Diverse

Headwater streams are probably the most varied of all running-water habitats; they range from icy-cold brooks tumbling down steep, boulder-filled channels to outflows from desert springs that trickle along a wash for a short distance before disappearing into the sand. As such, headwater systems offer an enormous array of habitats for plant, animal and microbial life.

This variation is due to regional differences in climate, geology, land use, and biology. For example, streams in limestone or sandy regions have very steady flow regimes compared with those located in impermeable shale or clay soils. Plants or animals found only in certain regions can also lend a distinctive character to headwater streams. Regionally important riparian plants, such as alder and tamarisk, exercise a strong influence on headwater streams. Headwater streams in regions with beavers are vastly different from those in regions without beavers.

Environmental conditions change throughout a stream network. In wet regions, streams grow larger and have wider channels, deeper pools for shelter, and more permanent flow as they move downstream. In arid regions and even humid regions during dry periods, headwater streams may become smaller downstream as water evaporates or soaks into a streambed. Because marked changes in environmental conditions can occur over very short distances, conditions required by a headwater species may exist for as little as 100 yards of stream. Consequently, local populations of a species may extend over just a short distance, particularly in spring-fed headwaters with sharp changes in environmental conditions along the length of a stream.

With this variety of influences, headwater streams present a rich mosaic of habitats, each with its own characteristic community of plants, animals, and microorganisms.



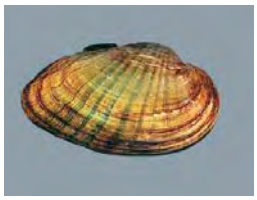




Headwater Systems Support a Diverse Array of Animals and Plants

Although there has never been a complete inventory of the inhabitants in even a single headwater stream, much less surveys across many types of headwaters, a recent review of existing literature highlights the significant biological connections between headwater streams and downstream ecosystems. The review found that small headwater streams that do not appear on most maps can support over 290 taxa, some of which are unique to headwaters, thus emphasizing the significant contribution of small streams to biodiversity of entire river networks.

Below: The venustaconcha ellipsiformis, a pearl mussel associated with Midwestern headwaters, is threatened with extinction. Photo courtesy of Kevin Cummings, Illinois Natural History Survey



Top left: A hydrobiid snail [Pyrgulopsis robusta] found in the headwaters of the Snake River in Wyoming. Photo courtesy of Dr. Robert Hershler

Center: Caddis flies and other aquatic insects spend their larval stage in streams, feeding on the algae, vegetation and decaying plant matter. The Brachycentris, a caddis fly found in headwater streams of eastern North America, constructs a protective case out of twigs, leaves and other debris. Photo courtesy of David H. Funk

Bottom: American dippers rely on headwater streams for sustenance, walking along stream bottoms and feeding on insect larvae and crustaceans among the rocks of the streambed. This American dipper was photographed at Tanner's Flat, just east of Salt Lake City. Photo courtesy of Pomera M. France

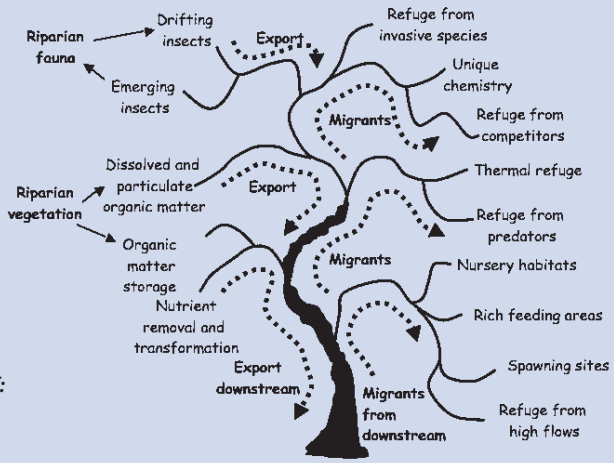


A water shrew (Sorex palustris) in the waters of Oregon's Mt. Hood. Photo courtesy of RB Forbes, Mammal Images Library



A coho salmon migrating up a spring-fed tributary of the Snowqualmie River watershed in Washington's Puget Sound region. Many anadromous fish species spawn in headwater streams that are so small as to be omitted from standard USGS topographical maps. Photo courtesy of Washington Trout.

The species in a typical headwater stream include bacteria, fungi, algae, higher plants, invertebrates, fish, amphibians, birds, and mammals. Headwater streams are rich feeding grounds. Large amounts of leaves and other organic matter that fall or blow into streams, the retention of organic matter in a channel or debris dams, and the high rates of plant and algal growth in unshaded headwaters all supply food sources for animals such as caddis flies, snails, and crustaceans. These animals become food for predators such as fish, salamanders, crayfish, birds, and mammals, which, in turn, become prey for larger animals, including herons, raccoons, and otters. Many widespread species also use headwaters for spawning sites, nursery areas, feeding areas, and travel corridors. Thus, headwater habitats are important to species like otters, flycatchers, and trout, even though these species are not restricted to headwaters. The rich resource base that headwaters provide causes the biotic diversity of headwater streams to contribute to the productivity of both local food webs and those farther downstream.



This figure illustrates the many benefits headwater streams provide to organisms living in downstream ecosystems and the connections between headwater streams and other ecosystems. Illustration courtesy of: Judy Meyer, University of Georgia.

Diversity of headwater systems results in diverse headwater plants and animals. Many of these species are headwater specialists and are most abundant in or restricted to headwaters. For example, water shrews live along small, cool streams, feed on aquatic invertebrates, and spend their entire lives connected to headwater streams. Because different headwaters harbor different species, the number of headwater-dependent species across North America is far greater than the number of species in any one headwater.

Headwater specialists often have small geographic ranges. These species, many of which are imperiled, include: species of minnows, darters, and topminnows in southeastern springs and brooks; aquatic snails in spring-fed headwaters

in the Great Basin, the Southeast, Florida, and the Pacific Northwest; crayfish in small streams from Illinois and Oklahoma to Florida; and salamanders and tailed frogs in small streams, springs, and seeps in the Southeast and Pacific Northwest. Two factors contribute to specialists' small ranges: their limited ability to move between headwaters and high diversity of headwater habitats. Unlike mobile animals, such as mammals and birds, fully aquatic animals like fish and most mollusks cannot move from one headwater stream to another. As a result, local evolution may produce different species in adjacent headwater systems. Moreover, environmental conditions often differ greatly between adjacent headwater streams and even within the course of a single stream. For example, in a spring-fed headwater stream in western Pennsylvania, one species of caddis fly inhabits headwaters starting at the spring and going downstream about 200 yards. A different species of caddis fly inhabits the stream after that point.

Animals may use headwater streams for all or part of their lives. Although many fish species live exclusively in headwater systems, others use headwaters only for key parts of their life cycle. For permanent residents and seasonal migrants, headwater streams offer refuge from high flows, extreme temperatures, predators, competitors, and exotic species. Recent research in Oregon has demonstrated that a significant proportion of coho salmon reproduction occurs in intermittent headwater streams, and young salmon use these small streams as refuge during high flow conditions. In other parts of the country, trispot darters, brook trout and rainbow trout spawn in small streams. Young cutthroat trout use shelter formed by streams' debris dams but move onto larger portions of a stream network as they mature. Intermittent streams can offer special protection for young fish, because the small pools that remain in such streams often lack predators. Still other fish species use headwater streams as seasonal feeding areas. These and other fish life cycles clearly demonstrate the linkage between the smallest streams on the landscape, large rivers, and the ocean.

Both permanent and intermittent streams provide valuable habitat for microorganisms, plants, and animals. Generally, biodiversity is higher in permanent streams than in intermittent streams, but intermittent streams often provide habitat for different species. Some species that occur in both types of streams may be more abundant in predator-free intermittent streams. For example, because of the lack of large predatory fish, salamanders and crayfish are sometimes more abundant in fishless intermittent streams rather than those with permanent flow. In contrast, for animals such as brook trout that require steady water temperatures and constant water flow, perennial streams provide better habitat.



A westslope cutthroat trout from Deep Creek, a headwater of the Kettle River. Cutthroat trout spawn in headwaters where the young trout seek shelter amid piles of debris, moving on to larger waters for their adult lives. Photo courtesy of Bill McMillan, Washington Trout

Linkages between Headwater and Streamside Ecosystems Boost Biological Diversity

The movement of plants and animals between headwater and streamside ecosystems boosts biodiversity in both areas. Headwater streams are tightly linked to adjacent riparian ecosystems, the zones along a stream bank. Riparian ecosystems have high species diversity, particularly in arid environments where the stream provides a unique microclimate. Typical riparian vegetation depends upon moist streamside soils. Some plants must have "wet feet," meaning their roots have to stretch into portions of soil that are saturated with water. Seeds of some riparian plants, such as those of cottonwood trees found along rivers in the Southwest, require periodic floods to germinate and take root.

Another link between stream and land is often provided by insects, such as mayflies, that emerge from streams and provide a vital food resource for animals, including birds, spiders, lizards, and bats. For example, insect-eating birds living by a prairie stream in Kansas consume as much as 87 percent of the adult aquatic



Canelo Hills ladies' tresses [Sprianthes delitescens] in a southwestern freshwater marsh known as a cienega. The cienegas of Arizona and New Mexico and Mexico, are the exclusive habitat for this member of the orchid family. Photo courtesy of Jim Rorabaugh, USFWS

insects that emerged from the stream each day. Such exchanges between land and water help maintain animal populations across landscapes. In many landscapes, the network of headwater streams is so dense that it offers a nearly continuous system of interconnected habitat for the movement of mobile species that rely on streams and riparian areas.

The Cleistes, a member of the orchid family, is found in pocosin wetlands of North Carolina. Photo courtesy of Vince Bellis



Biological Diversity of Headwater Systems is Threatened by Habitat Destruction

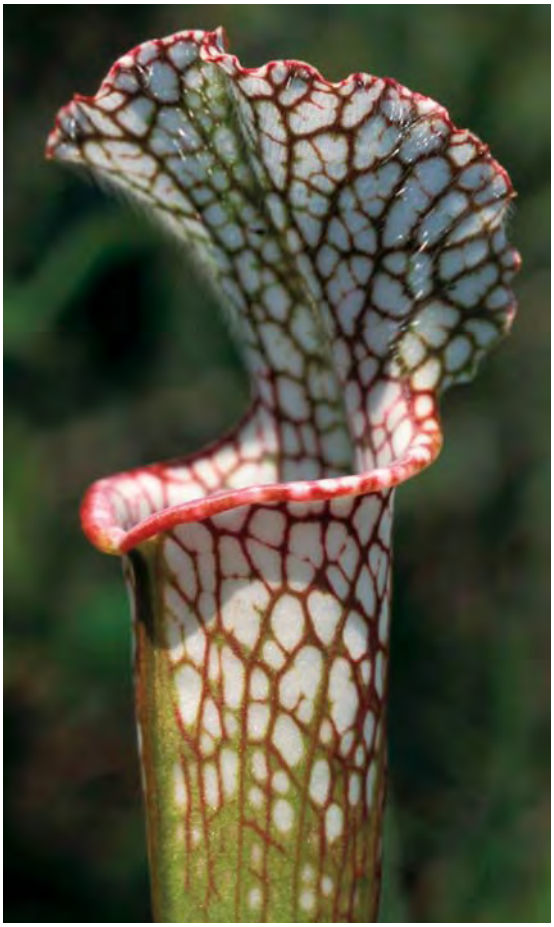
Because of their small size and intimate connections with surrounding landscape, headwaters and their inhabitants are easily influenced by human activities in watersheds and riparian zones. Changes to riparian vegetation or hydrology, water pollution, or the introduction of exotic species can have profound effects on biota living in headwaters.

Specialized headwater species can be particularly sensitive to habitat destruction because of their small geographic ranges, sometimes as small as a single headwater stream or spring. Thus, human activities have driven some headwater specialists, like the whiteline topminnow, to extinction, and imperiled many others. Furthermore, as the natural disjunction of headwater systems is increased by human activities such as pollution, impoundment, and destruction of riparian vegetation, more populations of headwater specialists may be extirpated.

Many headwater species, including fish, snails, crayfish, insects and salamanders, are now in danger of extinction as a result of human actions. A few dozen headwater species are already listed under the U.S. Endangered Species Act; hundreds of others are rare enough to be considered for listing. Given the diversity and sensitivity of headwater biota, it seems likely that continued degradation of headwater habitats will put more species at risk of extinction.

Wetlands Make Key Contributions to Biological Diversity

The presence of wetlands adds another aspect of habitat diversity to headwater systems and therefore increases the variety of species a headwater system may support. Most headwater wetlands are depressions in the ground that hold water permanently or seasonally, and scientists usually distinguish between ephemeral and perennial wetlands Wetlands provide critical habitat for a variety of plants and animals. Recent research found that a total of 274 at-risk plants and animals are supported by geographically isolated wetlands. Of those, more than one-third were restricted to these wetlands.



Pitcher plants, such as this white top (Sarracenia leucophylla), pictured top left; and sundews, such as this Drosera brevifolia, pictured bottom right; are among the carnivorous plants found in the Carolina Bay wetlands of the Southeastern U.S. Photo courtesy of David Scott/SREL

Biodiversity in ephemeral wetlands

Some species of plants and animals prefer or require ephemeral wetlands. Certain zooplankton, amphibians, and aquatic plants need the wet phase of an ephemeral wetland to complete all or part of their life cycles. Other species that rely on ephemeral wetlands wait out the aquatic phase, flourishing only when pools shrink or disappear. For example, although adult spotted salamanders are generally terrestrial, during the springtime they trek to vernal pools to breed and reproduce. So-called amphibious plants, including button celery, meadowfoam, wooly marbles and many others do the opposite; although they live in water, they cannot reproduce until water levels drop. Some plants and crustaceans most strongly identified with ephemeral wetlands worldwide, including quillworts, fairy shrimp, and tadpole shrimp, are ancient groups that probably originated at least 140 million years ago. The disappearance of ephemeral wetlands would mean the loss of these highly specialized and ancient groups of plants and animals.

One type of ephemeral wetland found in both California and the Northeast is known as a vernal pool because it generally fills with water in the spring. In California, blooming flowers ring the edges and fill depressions of such pools. Of the 450 species, subspecies, or varieties of plants found in California's vernal pools, 44 are vernal pool specialists. Several such plants are already on the Endangered Species list. If California's vernal pool habitats were completely destroyed, at least 44 species would disappear. Although vernal pool animals are less well known, there appear to be at least as many specialized animals as plants. New species of specialists such as fairy shrimp and clam shrimp continue to be discovered.

Other ephemeral wetlands also make significant contributions to biodiversity. A study of wetlands in the Southeast including cypress-gum swamps, cypress savannas, and grass-sedge marshes, found that plants from one wetland are often very different from those in others nearby. Such differences in nearby habitats increase overall biodiversity in a region. In some cases, differences



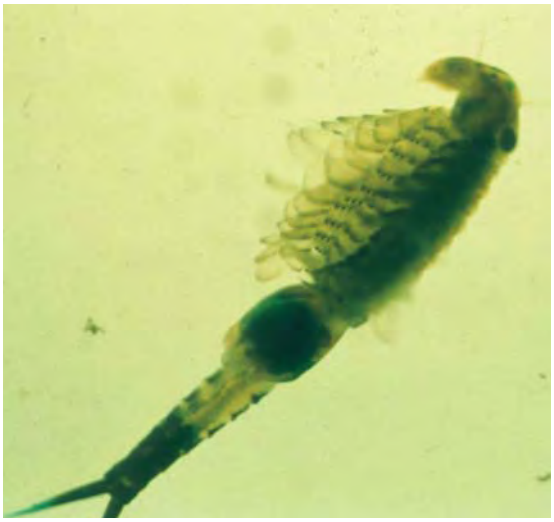
Pitcher plants, such as this white top (Sarracenia leucophylla), pictured top left; and sundews, such as this Drosera brevifolia, pictured bottom right; are among the carnivorous plants found in the Carolina Bay wetlands of the Southeastern U.S. Photo courtesy of David Scott/SREL



Although spotted salamanders are generally terrestrial animals, they only breed and reproduce in vernal pools. Photo courtesy of Vernal Pool Association

in periods of wetting and drying appear to be important for the persistence of many species. Different wetting and drying patterns explain some differences between Gromme Marsh and Stedman Marsh, two prairie pothole wetlands in Wisconsin. Although the two marshes are only about 450 yards apart, they have different species of dragonflies; also, Stedman Marsh has damselflies and caddis flies that Gromme Marsh lacks.

Amphibians are key parts of the food web in small wetlands. Some wetlands are hot spots for amphibian biodiversity; twenty-seven amphibian species, one of the highest numbers of amphibian species known from such a small area, inhabited a 1.2-acre ephemeral wetland in South Carolina. Other small wetlands in the region have been found to have similar numbers of amphibian species, demonstrating how small wetlands are especially important for maintaining the regional biodiversity of amphibians. Larger, more permanent wetlands may be less diverse because they may also be home to predators-such as crayfish and dragonfly larvae-that eat amphibian larvae.



A female fairy shrimp from the Ipswich River Basin in Massachusetts. Fairy shrimp spend their entire life cycles in vernal pools. Photo courtesy of Vernal Pool Association

Biodiversity in fens (a type of perennial wetland)

Plant biodiversity peaks in fens, unique perennial wetlands that occur where groundwater flows to the surface. Fens also provide clean water that supports downstream ecosystems; outflows from such wetlands are critical to the formation of the cold, low-nutrient streams that are ideal for trout. Although fens are rarely inundated, water seeps continuously into root zones.

Similar to other wetlands, the small land area covered by fens belies the high biodiversity found within them. For example, in northeastern Iowa, fens contain 18 percent of the state's plant species but cover only 0.01 percent of the land surface. Fens are probably the wetlands with the greatest numbers of plant species. Because groundwater that comes to the surface is typically low in available nutrients, fen plants are often dwarfed and the total mass of vegetation is typically low. As a result, no one species can become dominant and exclude other species.

In the Upper Midwest, more than 1,169 species of plants have been identified in fens, with more than half needing wet conditions. Fens also have a high proportion of plant species known to occur primarily in pristine sites. Often, such species are listed as rare, threatened or endangered. Of 320 vascular plant species found within fens in northeastern Iowa, 44 percent are considered rare. Fens themselves are imperiled: 160 fens that one researcher sampled in northeastern Iowa were all that remained from 2,333 historic fens.

Because diversity in fens stems from low nutrient availability, overfertilization can harm fens and, in turn, downstream ecosystems. Examining one fen in New York, researchers found the lowest diversity of plants where nitrogen and phosphorus inflows were greatest. Both nutrients came from agricultural activities: phosphorus was entering the fen primarily through surface water flows, while the nitrogen-containing compound nitrate was flowing with the groundwater. Thus, a loss of plant diversity in fens is a clear indication they are receiving excess nutrients, such as can occur when fertilizer runs off a field or urban lawn or water carries animal waste from farmyards. Allowing excess nutrients to enter fens can also damage downstream trout streams because trout prefer cold, low-nutrient streams. Therefore, the low-nutrient conditions of fens require protection from nutrient contamination.



A wood frog (Rana sylvatica) in an autumnal vernal pool in central Pennsylvania. Photo courtesy of Gene Wingert



Fens are unique perennial wetlands that occur where groundwater flows to the surface. Plant biodiversity peaks in fens: Among the 320 vascular plant species found in northeastern Iowa fens, 44% are considered rare. However, fens themselves are imperiled. Pictured is a fen wetland in Illinois. Photo courtesy of Steve Byers, Bluff Spring Fen Nature Preserve

Conclusion

Headwater streams and wetlands abound on the American landscape, providing key linkages between stream networks and surrounding land. Although often unnamed, unrecorded, and underappreciated, small headwater streams and wetlands-including those that are dry for parts of the year-are an integral part of our nation's river networks. Small wetlands, even those without visible surface connections, are joined to stream systems by groundwater, subsurface flows of water, and periodic surface flows. Current databases and maps do not adequately reflect the extent of headwater streams and associated wetlands. The resulting underestimate of the occurrence of such ecosystems hampers our ability to protect the key roles headwater systems play in maintaining quality of surface waters and diversity of life.

"The physical, chemical, and biotic integrity of our nation's waters is sustained by services provided by wetlands and headwater streams."

Essential ecosystem services provided by headwater systems include attenuating floods, maintaining water supplies, preventing siltation of downstream streams and rivers, maintaining water quality, and supporting biodiversity. These small ecosystems also provide a steady supply of food resources to downstream ecosystems by recycling organic matter.

Small streams and wetlands provide a rich diversity of habitats that supports unique, diverse, and increasingly endangered plants and animals. Headwater systems, used by many animal species at different stages in their life history, provide shelter, food, protection from predators, spawning sites and nursery areas, and travel corridors between terrestrial and aquatic habitats.

Since the 1970s, the federal Clean Water Act has played a key role in protecting streams and wetlands from destruction and pollution. We have made progress toward cleaner water, in part because the law has historically recognized the need to protect all waters of the United States. The health of downstream waters depends on continuing protection for even seemingly geographically-isolated wetlands and small streams that flow only part of the year.

Photo courtesy of Raymond Eubanks.



These small streams and wetlands are being degraded and even eliminated by ongoing human activities. Among the earliest and most visible indicators of degradation is the loss of plant diversity in headwater wetlands. The physical, chemical, and biotic integrity of our nation's waters is sustained by services provided by wetlands and headwater streams.

Today's scientists understand the importance of small streams and wetlands even better than they did when Congress passed the Clean Water Act. If we are to continue to make progress toward clean water goals, we must continue to protect these small but crucial waters. The goal of protecting water quality, plant and animal habitat, navigable waterways, and other downstream resources is not achievable without careful protection of headwater stream systems.

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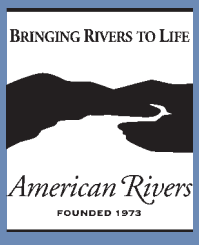
FOR ADDITIONAL INFORMATION ON SEVERAL TOPICS DISCUSSED IN THIS REPORT, READERS MAY CONSULT THE FOLLOWING WEBSITES:

http://www.nwrc.usgs.gov/

http://www.cwp.org/pubs_download.htm

http://www.epa.gov/OWOW/NPS/urbanize/report.html


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BRINGING RIVERS TO LIFE
American Rivers
FOUNDED 1973

TOWN OF VICTOR NRI – APPENDIX F
OPEN SPACE RATIONALE

Appendix F

Open Space Rationale

In 1970 the Town Board established a Conservation Advisory Committee. By state law, this council advised in the development, management and protection of the Town's natural resources. In 1974 the Committee became an official Town of Victor Advisory Board by completing its first Open Space Index as mandated by NYS General Municipal Law. The Index included an *Open Space Rationale* and a map highlighting sensitive areas in the town. All discussions of open space in the Town have been based on the concepts introduced in this work.

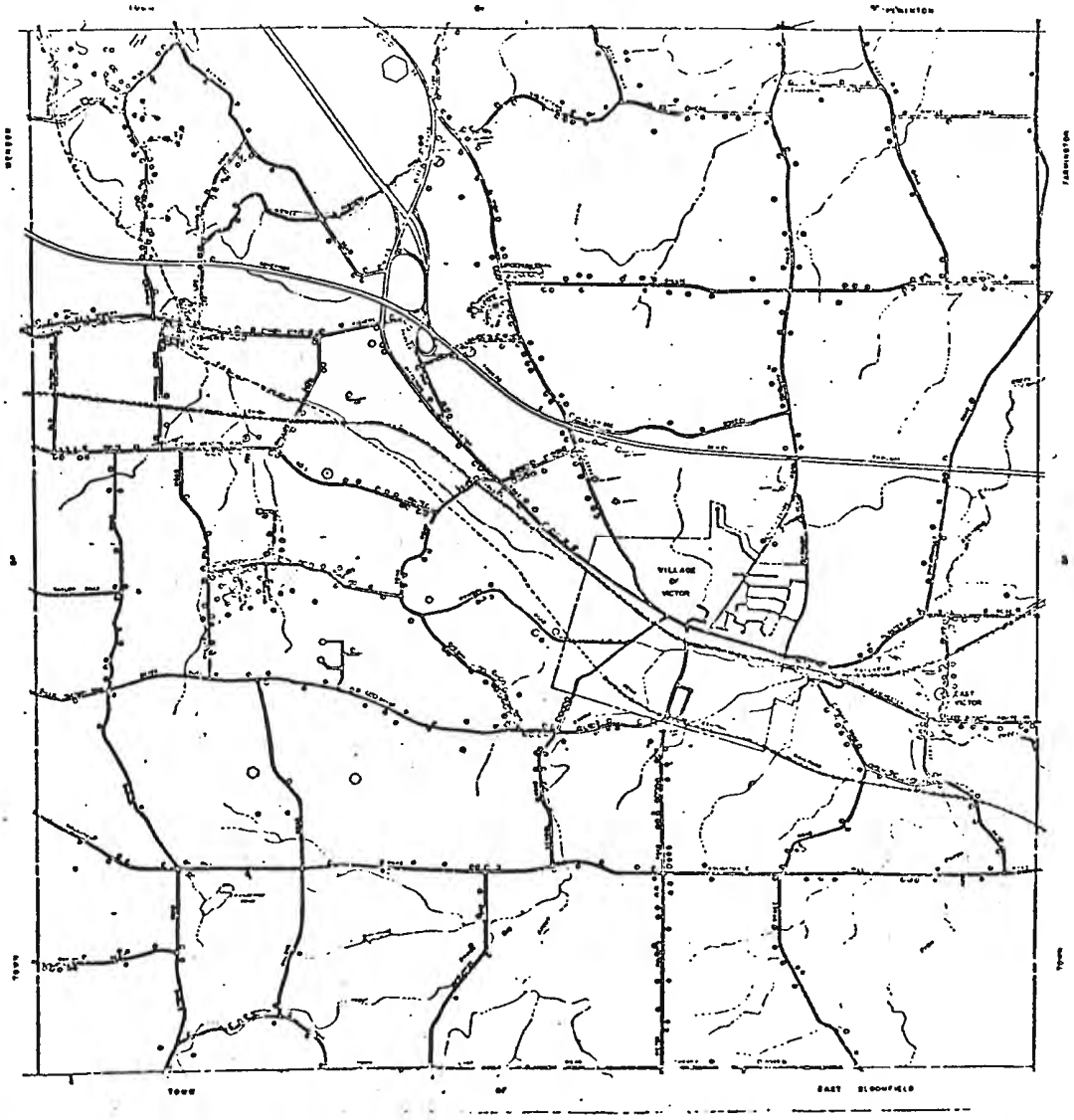
Forty years later, the Town is much closer to codifying meaningful Open Space protection regulations.

1974

TOWN OF VICTOR

CONSERVATION ADVISORY COUNCIL

OPEN SPACE RATIONALE



THE CONSERVATION ADVISORY COUNCIL

OF THE

TOWN OF VICTOR NY

JUNE 10, 1974

BRUCE VAN DERWATER, CHAIRMAN
ROBERT EMMONS, VICE-CHAIRMAN
KAREN HENRY
ALAN HILFIKER
HAROLD SHARP
DONNA STEWART
JOAN TROST
RICHARD WOODRING
CHAUNCY YOUNG

RICHARD BARRETT	EX-OFFICIO
BETSY DAVY	EX-OFFICIO
ED DORSCHEID	ADVISOR
JOHN DWYER	
TOWN JUSTICE	TOWN BOARD LIAISON

Priorities of Preservation or Acquisition

#1. Areas already committed to perpetual preservation.

Nature Conservancy
Audubon
Gannagaro
Town Parks

#2. Areas worthy of development constraints due to their sensitivity or function.

All wetlands regulated by the N.Y.S. Freshwater Wetlands Act.
All floodplains regulated by law.
Highway buffer areas.
Steep slopes of 15° or over (refer to the N.R.I. slopes overlay.)

#3. Remaining areas which, in the Council's opinion, do not require a higher priority at this time.

The Parks and Recreation Master Plan prepared by Kotz and Schneider in 1974 makes acquisition recommendations.

Unless there are significant changes in the development trends of the Town, the Conservation Advisory Council believes those recommendations are adequate.

I. OPEN SPACE in the TOWN of VICTOR

In pointing out the increasing citizen concern for maintaining open space in the Town of Victor, Ontario Co., the following study discusses the recreational values, economic advantages and the important conservation needs that such areas fulfill.

At the present time, Victor has considerable open space. Most of it is in private hands, however, and unless careful selective governmental planning is exercised to guide and assure that a portion of this current open space is preserved, there will be little left to utilize when needs and public demands become greater.

Traditional estimates as to how much open space a community requires are now thought to be inadequate in a society where recreation and the need for peaceful and quiet places to go are becoming increasingly important. Victor needs to insure a quality of life in the community by making the best use of its lands, providing recreation opportunities not only in the form of playgrounds, but also convenient natural areas for all ages.

There are various techniques for securing lands for open space including zoning, purchase and easements, as well as several methods of financing this acquisition. One of the prime requisites for such a program, however, is sincere and effective support by public officials. Official support is not only vital for gaining public support, but it is also a proven fact that broad public backing can very significantly reduce the costs of open space acquisition.

DEFINITION

When discussing "open space", this study will be referring to New York State's legal definition of the term (Gen. Municipal Law 247) which states, "Any space or area characterized by (1) natural scenic beauty or (2) whose existing openness, natural condition, or present state of use, would enhance the present or potential value of abutting or surrounding urban development, or would maintain or enhance the conservation of natural or scenic resources."

II. WHY OPEN SPACE for the TOWN of VICTOR?

The need for open space has come to be recognized in recent years by planners and conservationists alike not as a luxury but as a needed public benefit in its own right.[1] However, the municipality must approach open space pragmatically, in the terms of function for the community. In this report three basic functions will be considered:

(a) Establishment of recreational opportunity.

(b) Economic saving to the community by establishment of attractive community design and insuring a quality environment.

(c) The protection of natural processes or conservation.[2]

Each of these basic functions of open space has inherent physical, social and economic benefits, and in many cases, all three functions can be served by one parcel or one system of open space. Victor is fortunate to still have open space which fulfills the three functions.

A. RECREATIONAL NEEDS

In 1962, the Outdoor Recreation Resources Review Commission (ORR), appointed by President Eisenhower in 1958 to study the Nation's recreational needs, made the following conclusions: population will double before the century is out and recreational demand will triple. Moving away from group activities and team sports, the population will need a range of activities with greater emphasis on solitary pursuits and family oriented activities such as fishing, bicycling, nature study, picnicking, boating etc. Furthermore, recreational needs of the community should be met by facilities close by, within less than an hour of driving time. The ORR concluded that it is most important that a community have a "recreational environment", one that gives residents easy access for walking, fishing, bird watching, etc. Parks and playgrounds are not enough, a recreational environment must also be a natural environment.[3]

B. ECONOMIC SAVINGS to and ENVIRONMENTAL QUALITY of the COMMUNITY

As Victor develops it is going to have to take into careful consideration how it would like to see these lands developed.

It is natural that as Victor increases in population, municipal costs will also increase. These increases could become inproportionately large if the new land is developed as subdivisions in the traditional minimum lot size zoning regulations.[4] On the other hand, municipal revenues increase with environmental quality: the municipality saves money by not having to provide services to open space (other than protective services), while at the same time taxpaying properties near open space increase in value often in substantial amounts, regardless of whether the surrounding homes are new or old.[5]

An important way to plan for open space is through the use of cluster and town house zoning, and planned unit development (PUD). These concepts, if applied in the manner in which they are intended, can provide open space, recreation, tax savings, increase in assessments, savings in municipal services, and prevent sprawl, blight, expensive services and wasteful and inappropriate land use. They can also save the motorist frustration with traffic jams and provide residents with the "recreation environment" endorsed by the ORR. This is true not only for residential development, but for commercial development as well.[9]

The savings to a community by preventing damage to the environment are obvious. Allowing floodplains, steep slopes, and marshes to be developed can lead to millions of dollars in costs for flood control, sewer districts and water projects, as well as recurring headaches for public officials.

C. CONSERVATION

The non-economic benefits to a community from good conservation techniques should be considered as equally important as economic ones. Problems result from the development of floodplains and wetlands without adequate regard for natural processes. These areas tend to act as giant sponges, soaking up enormous amounts of water and returning some of it to the water table, and slowly releasing the rest: a ten acre marsh will accommodate 3,000,000 gallons of water in a one foot rise.[10]

While it is not always so obvious to him, man directly benefits from nature's cycles. Having a certain minimum amount of vegatation and particularly trees afforded by open space can mean important air purifying and moisturizing effects: for example, an acre of red maples in a moist habitat may give off water equivalent to 28 inches of rain in one year, in addition to absorbing such air impurities as sulfur dioxide.[10]

This is not to say that these wet areas cannot be put to a good public use. An example is a golf course. This course not only serves a public benefit, but also causes a minimum interference with an important part of the natural water cycle that another kind of development might not be able to do.

There are also the intangibles to consider which affect both the physical and psychological health and quality of life of the community's inhabitants: green belts to purify air pollution of traffic and prevent the ugliness of urban sprawl and act as buffer zones; the preservation of carbon dioxide cycles, oxygen cycles, and water cycles, without which man cannot survive; and finally the need for the human psyche to have a little breathing space, with peace and quiet and an opportunity to just get away at times from other people.

G. Scott Williamson, an English biologist, felt that the health in the individual was likely to be associated with health of the family and, indeed of the community. He believed that physical and social health were unified attributes and there were aspects of the physical and social environment that were their corollaries.[11]

As government tries to balance the rights of property owners with the needs of the public, let us not forget that both public institutions and private owners are also stewards of the land, and that both have an obligation to manage and protect the land for the next generation.

III. CRITERIA for OPEN SPACE

A. General Guidelines

Open space acquisition, in order to be effective as well as permanent, should fulfill the earlier mentioned functions: recreation, economy environmental quality and conservation. Fortunately, these functions can easily apply to the same land, particularly if it is a water system. In fact, Ian McHarg, todays leading environmental planner, contends that if water resources and the related land system are preserved, then all needs are necessarily met.

Open space should not be entirely in bits and chunks scattered throughout the municipality, but should include linear strips weaving throughout the area, although a facade of trees hiding another subdivision should not be considered open space. Charles Little points out that the demand for water-based recreation is increasing even more rapidly than the demand for outdoor recreation in general, in terms of both active and passive recreation.[11a]

Ideally, these connecting strips of open space should run throughout an entire region, from one community to another. This is more easily accomplished when the area is based on a water system or geological features. From a practical standpoint, the boundaries of open space should follow natural boundaries, rather than be a line drawn through the middle of an open field, for instance. The natural boundary keeps people in the right area and also protects the open space from nibbling pressures to develop it.

Finally open space should meet a public need, not only for the present population but for the next generation as well. To assure that there will be adequate open space for public use in the future, it may be necessary for the Town to control through zoning and acquiring easements, some areas of private as well as public lands. This must be done in a manner protecting the rights of individual property owners, but at the same time protecting present and future public rights. This can and has been done by providing incentives sometimes through tax savings to encourage public support. Taxpayers have also shown that they will support open space specifically for aesthetic reasons, even though there is no tax savings and even if they do not have access to the land.[12] At the same time courts have upheld a community's right to acquire land for "public use" even in broad senses where the land is just preserved, though not necessarily used for active recreation. For example, recent court decisions upholding condemnation of billboards along roadsides have been based on the public's "right to view."

B. HOW MUCH OPEN SPACE?

According to Whyte, Little and McHarg, the "ten acres per thousand people" put forth by the National Recreation Association (now the National Recreation and Park Association) is misleading and meaningless. No one even remembers the reasons for these figures, or who devised them. Furthermore, they deal with only one aspect of open space-recreation. McHarg feels that the amount of open space should be determined by natural processes, rather than an acreage formula.[13]

Other criteria to determine how much open space to preserve have been developed by Marion Clawson, an economist with Resources for the Future, Inc. He believes there should be 78 acres of open space of all kinds and for all purposes for every 1000 population. Forty-two acres would be the responsibility of federal or state governments for large parks, watershed protection, etc. But 36 acres per 1000 people would be the responsibility of local government: 14 acres for parks and recreation, 5 acres for "private recreation" such as golf courses, and 17 acres for green space.[14]

The Regional Plann Association recommends overall preserved open space in the New York Region be tripled. This amount of land "would result in a permanent reserve comprising 25% of the Region's terrain. Nothing less will provide the Region's prospective 1985 population of 24 million with a liveable physical environment." [15]

IV. HOW to ACQUIRE OPEN SPACE

A. General Guidelines

There are many techniques for acquiring open space. In general we recommend that:

1) the plan be a comprehensive proposal that is government endorsed and presented to the public for approval. A comprehensive plan is needed to achieve maximum use of the land--. Also, case studies have shown that when given a comprehensive concept that is endorsed by government leaders and presented in a positive manner, open space proposals will receive the support of key citizens who then rally larger public support. The recent passage of the State Environmental Bond issue gives credence to this position.

2) Land acquisition by the government is necessary, but other means of acquiring land through easements and private donation should be utilized. Furthermore, it often works best to have a non-profit organization such as the Audubon Society or Nature Conservatory or a conservation group administer trusts and bequests, rather than the government which has partisan overtones.

It is important not to underestimate the potential of acquiring land and easements to land through gifts and bequests: "There are a surprising number of landowners who will give land for parks and natural areas if they are asked to. Over half of our existing parklands were donated and the gift potential is as great as ever. Federal income tax regulations make it possible for many people to give land and get full market value as a charitable deduction." [16]

3) Keep the proposal in its broadest application when seeking public support. After the idea has been sold, then decisions can be made about specific restrictions. [17]

Financing is always a problem, but studies indicate that "where there's a will there's a way." Many towns have found that substantial open space may be acquired when private owners give up their rights to development by donating or selling easements. Many older citizens are anxious to see their land remain undeveloped, and by working out property tax savings, estate tax savings, life tenancy arrangements or establishment of town systems of nature preserves, etc., their land can be preserved.[18] But, at the core of these private means there is needed a governmental commitment and definitive program of open space. Our studies indicated that simply zoning land for open space or agriculture zones is not a permanent solution; there must be other mechanisms to supplement zoning.[19] However, a form of "Restricted Area" (RA) see Appendix A, zoning can be a buffer for open space areas that the Town selects to preserve. By classifying land in an RA zone, the Town can assure itself the opportunity to oversee land and its potential development so that it is compatible with the environment and the public interest.

B. TECHNIQUES for ACQUIRING OPEN SPACE

1) Local Sources of Financing

> "The most direct way of getting funds to acquire open lands for a public purpose is to go straight to the public, after laying the ground work and doing a good selling job. A bond issue is one of the "cleanest"approaches. People are concerned about the environment. It has been proven time after time that people will vote overwhelmingly for a better community by buying open land for recreation, outdoor education and environmental purposes, even when other issues on the ballot are being voted down.

Funds earmarked for special acquisition projects may be placed in the annual budget of a municipality. Further, the State Legislature has empowered municpalities to create Capital Reserve Funds to carry money over from one year to the next for projects too costly to be covered in any single budget.

Special benefit assessment districts may be created by local governments as a means for paying for park or other open space land in localized neighborhood situations.

A private land "trust" or foundation, a sort of local Nature Conservancy created as an adjunct to a conservation commission, usually will attract acquisition funds from business or industry or from small foundations, not to mention actual donations of land .....

Stretching the Dollar

"There are ways of stretching limited acquisition funds. Apart from less-than-fee purchases, such as conservation easements, the cost of outright purchase may be modified. For example, the land may be purchased and then leased back to the original owner or to someone else. This takes the land off the tax roles, which helps the original owner if he becomes a leasee. It also eliminates the speculative rise in land values which the open space agency would have to face if it bought the land at a later date.

"Another way of purchasing land and obtaining income from it to offset the purchase price is to have the property owner continue to occupy the land during his lifetime. Full payment may be postponed under this lifetime-estate arrangement.

"A third approach is that of an option-agreement. A parcel of land is divided into equal segments under this method. Each annual payment for one of the segments-- there usually are ten-- perpetuates the option to buy the next segment. During these installment payments, the remaining land will not be altered or developed because the option-agreement protects the buyer from this.

These methods will Save a local government money while it implements its open space plan. The key to using them is the ability to negotiate with a view towards understanding the landowners's needs, problems and particular feelings about this land. Capital gains and other tax considerations are a big factor."[20]

2) Easements

The conservation values at stake may relate to preservation of unique natural conditions, stream protection or drainage control, noise and safety buffer zones around airports, scenic view control, protection of a historic and culturally valuable landscape, maintenance of trails or public rights-of-way or across private land, soil conservation or protection of unique and economically

viable agricultural land, or green belt preservation for development control . . .

"Legislation authorizing the purchase of easements for open space purposes" already exists in New York. Section 247 of the General Municipal Law establishes open land preservation as a public purpose. Although this law has not been widely used since it was passed in 1960, it does authorize any municipality to expend public funds to acquire interests or rights in real property for the public benefit. Specifically, open lands may be obtained by purchase, gift, grant, bequest, devise, lease or otherwise, in fee or any lesser interest, including development rights, easements, covenants or any other contractural rights . .

In most situations, conservation easements will cost about 50% of full fee value and in many instances, they have been donated. The cost of easements will vary greatly depending on their location, overall land values and the bundle of property rights obtained.

Even if a conservation easement costs 80 or 90% of full fee value, the public benefits not only from the public purposes obtained by preserving the open space, but also because the land stays on the tax rolls. The land remains "alive", with the owner continuing to use it for his current purposes. Also, no public funds need to be expended to maintain the land, as would be the case with lands obtained in full fee . . . .

The need to"sell" the easement idea should not be underestimated. An extensive ground work of support must be laid for an open space acquisition program generally and for conservation easements in particular. Land owners naturally are going to be apprehensive about the restrictions . . . .

Landowners often are concerned about donating easements to a public agency because of the possibility of policy changes. They can be protected by inserting reversionary clauses in the deed . . . .

Condemnation for conservation easements by municipalities is not specifically authorized by Section 247, although a 1963 Opinion of the Comptroller suggests that since it is not prohibited either, it may be allowable. There have been no court tests for this aspect of Section 247. [21]

3) Private Grants (see preceding pages for comments).

4) Delinquent tax lands, rights of way, street closings, golf courses about to be sold.

5) Federal and State Grants - Under the present federal administration, these funds are harder to get. They also sometimes have strings attached - for instance, non-residents cannot be excluded. Grants certainly are worth looking into once a plan is developed.

6) Foundation such as the Ford Foundation.

7) Zoning - Flood plain, ecologically unique lands, slopes, historic districts, agricultural or open space districts, billboard zoning, scenic zoning; Cluster, PUD, large lots, sub-division open area dedication, Official map; When considering zoning, it is important to keep in mind that it can affect assessed valuation and that private property owners should not be expected to foot the bill.

Victor has seen many of its residents move here from the City to enjoy its open, greener and less crowded conditions. Victor is in a position now to plan its future to insure to its citizens that proper and sufficient open space will be present, and that Victor will not grow more and more like the City they left behind. However, it is up to the Town to guide the pressures for development and accept the challenge to set the pace for open space preservation. The Town should begin to pursue immediately a positive program of open space preservation.

The Environmental Conservation Advisory Council would like to offer its support and assistance to the Town in such a program.

FOOTNOTES

1. Although the Town of Victor presently has large tracts of open space held by private owners, past experience in other communities and states reveals that such privately owned opened space, even when zoned for open space, inevitably falls to the pressure of development. It is to be noted that local governments have the right to acquire land not for public use.

2. The economic advantages to a government of environmental quality is discussed in Section IIB.

3. This is because per capita disposable income will rise, the work week will diminish, and paid vacations will increase.

4. For further illustration, see Whyte, William, The Last Landscape (Garden City: Doubleday & Co., 1968), p. 15-19, and Little, Charles, Challenge of the Land (New York: Pergamon Press, 1969), p. 43 and p. 79 ff.

5. See Little, ibid., chapt. 6 for examples, statistics, and case studies to back up this claim.

6. Ibid., p. 83.

7. For a discussion on attempts of cities to control population growth and development, see Whyte, op. cit., chapts. 8 & 9.

8. Ibid., chapters 1, 8, 9.

9. Strip commercial development, which has been attached for aesthetic reasons, also brings in the long run added costs for municipal services. New York State Office of Planning Coodination, Zoning in New York State, 1968, pp. 61-67

10. Little, op. cit., p. 15

11. McHarg, op. cit., p. 187

11a Little, op. cit., p. 11

12. Little, op. cit., pp. 29-32, 74-75. These pages illustrated how public support has been gained, or lost by different procedures. See also Whyte, op. cit., p. 51 for court decisions on billboards, and 303-5 for Federal Beautification Act of 1965 which provides for scenic corridors.

6. Shomon, Joseph J. Open Land for Urban America. Baltimore, Maryland:: Johns Hopkins Press, 1971.

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NATURAL RESOURCE INVENTORY & ASSESSMENT

TOWN OF VICTOR, NEW YORK

APRIL 2014

Volume 2

Tools for Planning and Assessment

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INTRODUCTION TO NRI VOLUME 2
ASSESSMENT AND PLANNING TOOLS

Volume 2 of the Victor Natural Resource Inventory contains several "tools" that can be used by the Victor Conservation Board, planners and developers to assess properties and development proposals in the Town of Victor. These tools can be used singly or in conjunction with one another to provide an in-depth look at the environmental resources located on a parcel or potentially affected by development. The background information on important natural resources in the Town of Victor provided in NRI Volume 1 should also be relied upon in making these assessments.

A brief description of these Assessment and Planning Tools is provided below.

12. Co-occurrence & Wildlife Field Data Collection Form

The Co-occurrence & Wildlife Field Data Collection Form is a tool for collecting field data in the Town of Victor. The form is designed to collect a comprehensive range of data about a specific parcel and to achieve consistency in the type and breadth of data collected. It is anticipated that the form will be used by Town personnel, citizens, and consultants.

"Mapped Resources" on page 1 of the field data form can be completed using electronic mapping resources prepared in conjunction with the NRI. Wetlands, streams and floodplain information can be gleaned from the Protected/Regulated Land map which has been provided as a companion map in the Open Space Index (see NRI Volume 2, Section 16.). Information regarding habitat, woods, and generalized land cover can be assembled from the Open Space Index's primary map set: Natural Resources Map, Agricultural Resources Map and Cultural Resources Map. The Co-occurrence ID can be found on the Co-occurrence Location Map found in NRI Volume 2, Section 13. Mapping of steep slopes in the Town of Victor is found on Map 1.13. However, given the level of detail on Map 1.13, it is anticipated this box on the field data form will be checked based upon visual observation.

"Wildlife Habitat Observance" on page 2 of the field data form contains a list of wildlife habitat types found in the Town of Victor. This section of the form is designed to be used in concert with NRI Volume 2, Section 14/Wildlife Habitat Inventory. Each of the habitat types listed in the field data form is described in detail in NRI Volume 2, Section 14. Section 14 also includes a photograph of a representative example of each habitat type.

The "Co-occurrence Observation" section on page 2 of the field data form collects information on areas where important natural resources are co-located, referred to as co-occurrences. Co-occurrence areas which have already been identified by the Town of Victor are described in NRI Volume 2, Section 13/Co-occurrence Analysis and Inventory. It is anticipated that the co-occurrence portion of the field data form will primarily be used to identify and describe new co-occurrence areas.

Pages 3 and 4 of the field data form are designed to collect information regarding Wetlands, Steep Slopes, Wooded Areas, Streams, and Stream Riparian Areas (including Floodplain areas). The information collected on this portion of the field data form will be helpful in rating new co-occurrence areas in accordance with the numeric ranking tables in NRI Volume 2, Section 13.

The "Potential Stream Candidate" portion of the field data form (page 4) allows information to be recorded on whether the stream can be considered a potential candidate for storm water retrofits, stream restoration, riparian management and/or improvement of existing discharge structures.

Finally, page 5 of the field data form can be used to record information about photographs taken at the site.

13. Co-occurrence Analysis and Inventory

In 2012, the Town of Victor engaged BME Associates to prepare an analysis of areas in which multiple natural resources exist in co-occurrence with one another. These resources include wetlands, woods, steep slopes, streams and floodplains. This section of NRI Volume 2 describes the methodology used to inventory co-occurrence areas, including ranking tables which indicate a numerical score for different types of natural resources based on their ecological value. The numeric ranking system is followed by a description of the watershed sub-areas used to define co-occurrence areas by their watershed location.

The inventory of the co-occurrence areas greater than 10-acres in size identified by BME in 2012 is included in NRI Volume 2, Section 13. A total of 29 co-occurrence areas are included, defined by the watershed in which they are found. Each co-occurrence area is listed with its numerical ranking, a photograph, its location, and descriptive information regarding the natural resources present. A summary table and map of all 29 co-occurrence areas are also found in this section of NRI Volume 2.

14. Wildlife Habitat Inventory

The Town of Victor commissioned a Wildlife Habitat Inventory in 2013, prepared by BME Associates. The results of the inventory are presented in NRI Volume 2, Section 14. This section includes a color-coded map showing the distribution of 21 habitat types within the Town of Victor. This information is also summarized in a table which indicates the approximate land area encompassed by each habitat type as well as the percentage of the overall Town land area it represents.

The 21 habitat types are categorized as Temperate Broadleaf Forests, Meadowland, Shrubland, Wetlands, Farmland, Open Water and Open Space. Within these broad categories, each individual habitat type is described in terms of:

- Location,
- Size,
- Co-occurrence areas (referred to by the identifier given in NRI Volume 2, Section 13),
- Description of overall habitat,
- Characteristic species, and
- Representative Wildlife Species.

As previously stated, the habitat information listed above should be referenced to correctly classify the habitat type when using the Co-occurrence & Wildlife Field Data Collection Form.

15. Steep Slope Policy

The Victor Conservation Board has long identified the need for a policy regarding development on or near steep slopes that incorporates a more complex analysis of steep slopes issues, beyond the quantification of "steepness" (grade). The steep slope policy in NRI Volume 2, Section 15 was prepared on behalf of the Town of Victor by LaBella Associates in 2013. The Conservation Board, planners, and developers should refer to the Steep Slope Policy in the assessment of properties or development proposals where steep slopes are of concern. The policy will also be helpful in the analysis of co-occurrence areas, described in NRI Volume 2, Section 13.

Specifically, the Steep Slope Policy is designed to be used in the evaluation of activities that disturb, re-grade or eliminate steep slopes within the Town of Victor. The policy is based upon the evaluation of multiple factors, including the following:

- Grade
- Soil Erodibility/Depth to Bedrock
- Hydrology/Groundwater
- Stability/Geo-mechanical Characteristics
- Vegetation
- Wildlife Habitat Value
- Co-occurrence and Diversity
- Unique Land Forms / Aesthetic Value, and
- Contribution to Community Character.

The level of scrutiny required in the review of a given proposal depends upon the number of factors found to be relevant to the proposal, as well as the level of potential risk associated with each relevant factor. A matrix is included in the Steep Slope Policy that assigns a numerical score to different aspects of each of the factors listed above. The total score that results for a project then indicates the suggested level of scrutiny (low, moderate or high).

16. Open Space Index

The purpose of the Open Space Index is to identify, describe and map the open space in the Town of Victor and to determine the extent of various types of open space, both town-wide and in individual parcels. Open Space was characterized into three broad groups: Natural Resources, Agricultural Resources, and Cultural Resources. Maps were prepared for each of these categories to illustrate the significant open spaces (> 5 acres).

- ❖ The Natural Resources Map references the same "land cover type" sub-categories as the Wildlife Habitat Inventory (e.g. "Appalachian Oak Hickory" or "Shrub Swamp.") As a result, the Open Space Index Natural Resources Map in NRI Volume 2, Section 16 is basically the same as the Wildlife Habitat Inventory Map in NRI Volume 2, Section 14 (with minor exceptions).

- ❖ The Agricultural Resources Map illustrates specific agricultural categories of open space, including actively farmed land, as well as abandoned farmland, old fields and shrublands that are reverting to forests.

- ❖ The Cultural Resources Map includes other open spaces such recreational land and sand or gravel mines.

Together, the Natural Resources Map, the Agricultural Resources Map, and the Cultural Resources Map encompass the entirety of open space areas greater than 5 acres in the Town of Victor.

Two companion maps are also available in the Open Space Index to provide a different subset of information regarding open space for Town users. The first companion map "Protected/Regulated Land" indicates protected or regulated open spaces such as State and Federal wetlands, NYSDEC classified streams, public parks, privately owned conservation land, and lands protected by Town conservation easements. The second companion map "Existing and Potential Agricultural Land by Agricultural Soils Classification" provides soil information for the Town of Victor's existing agricultural land and potential agricultural land.

The Open Space Index also provides the Conservation Board, planners, and developers with interactive resources (stored on a compact disc), including an electronic parcel database and interactive maps created with ArcGIS Publisher. The parcel database is a table in Excel format of tax parcels greater than 5 acres with a breakdown of how many acres are included in each category and sub-category of open space. The interactive maps include:

- Each of the townwide land cover maps that depicts each category of open space, and
- A parcel-based map with data attached to each parcel (>5 acres) that indicate the extent of open space, of each type, contained within the parcel.

TOWN OF VICTOR NRI - VOLUME 2
12: CO-OCCURRENCE & WILDLIFE FIELD DATA COLLECTION FORM

Town of Victor
Natural Resource Inventory
Field Data Form
Wildlife Observation ☐
Wildlife Habitat Observation ☐
Co-Occurrence Observation ☐
WATERSHED: _____

The purpose of this Field Data Form is to provide The Town, the public and consultants a document in which Wildlife, Wildlife Habitat and Co-Occurrences can be observed and reported within the Town of Victor.

Name of Observer:_____

Nearest Intersection (to site): _____

Address of site (if applicable):_____

Date of observance: _____

Photos taken? _____

Mapped Resources (using NRI map tools):

Wetlands:
- State ☐ I.D. _____
- Federal ☐

Steep Slopes ☐
Streams ☐
Woods ☐
FEMA Floodplain ☐
Habitat _____
Generalize Land Cover _____
Co-Occurrence I.D. _____

Wildlife Observation:

Wildlife Observed: _____ Quantity: _____

Gender: Male ☐ Female ☐ Unsure ☐

Age: Young ☐ Adult ☐ Unsure ☐

Location of sighting: ☐Wetlands ☐ Streams ☐Open Water ☐ Woods ☐ Meadow ☐Lawn/Landscape ☐Shrubs ☐Other

Remarks:_____
_____

Wildlife Habitat Observance:

- ☐ Appalachian Oak Hickory Forest
- ☐ Successional Northern Hardwood Forest
- ☐ Beech-Maple Mesic Forest
- ☐ Hemlock-Northern Hardwood Forest
- ☐ Floodplain Forest
- ☐ Conifer Plantation
- ☐ Successional Southern Hardwoods
- ☐ Successional Old Field
- ☐ Successional Shrubland
- ☐ Farm/Artificial Pond
- ☐ Cropland
- ☐ Successional (Abandoned) Farmland
- ☐ Shallow Emergent Marsh
- ☐ Deep Emergent Marsh
- ☐ Shrub Swamp
- ☐ Rich Shrub Fen
- ☐ Northern White Cedar Swamp
- ☐ Silver Maple Ash Swamp
- ☐ Hemlock Hardwood Swamp
- ☐ Eutrophic Ponds
- ☐ Confined River
- ☐ Orchard
- ☐ Pasture
- ☐ Recreational, Residential Area

(Note: Refer to NRI Volume 2 Section 14 "Wildlife Habitat Inventory" for details of each habitat type.)

Remarks:

_____

_____

_____

Habitat Degradation:

- ☐ NO
- ☐ Evidence of significant chemical contamination
- ☐ Evidence of significant levels of dumping
- ☐ Evidence of significant erosion or sedimentation problems
- ☐ Significant invasion of exotic plants (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
- ☐ Disturbance from roads or highways
- ☐ Other human disturbance

Remarks _____

Co-Occurrence Observation:

Site Description:

Co-occurrence Size: +/- _____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Wetland

Dominant Species: _____

Remarks: _____

Wetlands:

☐ YES ☐ NO
Habitat Type: _____
(Note: See NRI for individual types of wetland habitats and their description)

Permanently flooded (flooded all year around) ☐ YES ☐ NO Depth: _____
Seasonally flooded (usually dry in summer/fall) ☐ YES ☐ NO Depth: _____
Saturated (moisture within 12" depth of soil) ☐ YES ☐ NO

Vernal Pools ☐ YES ☐ NO
Drainage Patterns (defined path of water movement) ☐ YES ☐ NO

Remarks: _____

_____

Steep Slopes:

☐ YES ☐ NO

Estimated Slopes: %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
☐ Invasive Species

Stability ☐ good (mature healthy trees, large variety of species)
☐ fair ☐ poor

Remarks: _____

_____

Woods:

☐ YES ☐ NO

Quality ☐ good (mature healthy trees, large variety of species)
☐ fair (limited variety of species, softwoods, some damage <10%)
☐ poor (limited variety of trees, softwoods, damaged >10%)

Remarks: _____

_____

Stream:

☐ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section
From: _____ To: _____
Velocity: Slow Shallow ☐ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☐ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☐ Bushes, shrubs ☐ Tall grasses, ferns, etc. ☐ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☐ NO Severity: High ☐ Medium ☐ Low ☐

Stream Riparian Areas:

EXISTING RIPARIAN WIDTH:
(Note: Riparian is the bank of the stream and adjacent vegetation such as trees, shrubs, low vegetation)
☐ ≤ 25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Wetland
Quality ☐ good ☐ fair ☐ poor
Floodplain ☐ yes ☐ no

Remarks: _____

_____

Potential Stream Candidate: ☐ NO ☐ YES (see below)

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ existing discharge improvement ☐ other: _____

Remarks: _____

Photo Inventory

Date	Stream/ Reach	Location ID	Photo #	Description

TOWN OF VICTOR NRI - VOLUME 2
13: CO-OCCURRENCE ANALYSIS AND INVENTORY

Co-occurrence Analysis and Inventory
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1.0 Introduction

In 2012, the Town of Victor engaged BME Associates to prepare an analysis of areas in which multiple natural resource features exist in co-occurrence with one another. These resources include wetlands, woods, steep slopes, streams and floodplains. Existing information was utilized, additional research was completed and surveys of actual field conditions of the natural resource co-occurrence areas were performed. As a result, an inventory of co-occurrence areas greater than10 acres in size was completed in 2012, and is reported in Volume 1, Section 6 of this Natural Resource Inventory.

The same analysis can be applied to evaluate natural resources on a specific site, as development or other projects arise in the future. The Co-occurrence Analysis methodology is designed to be a valuable planning tool for the Town of Victor including town staff, advisory boards, residents, and land owners. The analysis can be used to assess the natural features and resources located on any individual piece of property, regardless of parcel size, or the type and number of natural features present. The tool presented herein will provide an effective assessment process which will bring consistency to the natural resource inventory process and will aid the Town in land planning decisions.

The step by step methodology for co-occurrence analysis on a subject property is presented in this document. This includes description of how to use available online mapping and Town resources to conduct the initial assessment. The standard field assessment form is presented and explained, along with the ranking system utilized in this survey.

One of the encouraging findings of the initial analysis of co-occurrence areas was the degree of accuracy that was obtained from online resources in mapping co-occurrences. Of the 40 co-occurrence areas mapped and surveyed in the initial analysis, over 90 percent of the areas field-surveyed confirmed the preliminary findings of the resource mapping assessments. The field surveys validated the map assessment process. So, even if one is not adept at identifying specific species of plants or assessing woodlot health, following the steps of the map assessment described herein will provide enough information to determine if a subject property warrants further investigation of natural resources. As such, one of the first steps in any land use or land planning process should be an assessment of natural features per the methodology outlined in this document.

The co-occurrence methodology provides an inventory of co-occurrence areas and does not pass judgment on protection, regulation, or other courses of action for the co-occurrence areas. It will be the responsibility of the Town Board, working with staff, advisory boards, and consultants, to determine how the Town Code, and Town Design and Development Standards should be modified to address co-occurrence areas.

Addressing co-occurrence areas within the Town Code will need to consider several factors, beyond identifying and assessing co-occurrence areas on property. Issues such as regulation, enforcement, stewardship, and property owner rights will all need to be considered and an effective balance established. This can be done, and the key to success will be the engagement of all stakeholders in establishing the appropriate codes and standards to address co-occurrence areas on properties.

2.0 Identification and Evaluation Methodology: The Approach

The following is a summary of how the co-occurrence areas were located and evaluated. This methodology can be applied to additional co-occurrence areas within the Town that need analysis or that arise as a site is proposed for development.

Desktop assessment

Areas were identified using information from the Town, available GIS maps, and input from the Conservation Board. GIS information from Labella Associates and Ontario County was used to create the initial co-occurrence maps where wetlands, streams, floodplains, steep slopes and woods were evident and overlapped.

Field Data Form

A field data form was developed to collect comprehensive information on what was observed via roadside or via field surveys. This form was developed to maintain a scientific approach to the evaluation and can be used by developers, residents, or Town staff that need to collect data on a specific site. The data collected includes observed wildlife or evidence of wildlife, habitat (trees and plants on the site), health of the habitat, steep slopes, wetlands, streams, riparian areas and other hydrology. The Field Data Form is attached in Volume 2, Section 12.

Surveys

- Roadside surveys were conducted utilizing the draft map of co-occurrences, as a reference. These surveys validated map assessment finds and identified other potential co-occurrence areas.
- Some co-occurrence areas with public access were field surveyed. Some of the field visits included members of the Conservation Board. All surveys used the Field Data Collection Form found in Volume 2, Section 12.
- Where access was allowed, co-occurrence areas were field surveyed using the Collection Form

Report completion

The NRI Co-occurrence report was prepared based on the information gathered during surveys and office background work. The Town of Victor lands were divided into individual watersheds and co-occurrences were described as they function in those watersheds. The co-occurrence map was finalized based on the actual field observations and/or best available resources.

3.0 Resource Descriptions and Rankings

By definition, each co-occurrence includes at least two natural resources: Wetlands, Woods, Steep Slopes, Streams, and Floodplains. The rankings shown below are completed for each resource individually and added for each co-occurrence. The following sub-sections present the resources' descriptions and basis for ranking. Add info – where and how to use ranking? Is it placed on form, don't see a spot, is it tallied at end and then added to ranking table?

3.1 Wetlands

Wetlands are valued natural resources. Most of the co-occurrences are the result of a wetland located within another resource. As noted in Volume 1 of the NRI (Section /Wetlands), wetlands can provide many benefits including: wildlife habitats, natural water quality improvement, flood storage, aesthetic value, and economical value (flood prevention, green infrastructure, erosion prevention). Wetlands, divided by their water regime and plant cover, are described and given a numeric ranking score in the table below.

Wetland Type	Wetland Description	Quality	Ranking
Wooded Wetland (Swamp)	Wetland dominated by woody species: trees and shrubs, soils are usually saturated and seasonally inundated.	Good Mature trees, organic soils, variety of plant and wildlife species. Fair Young Trees; not a lot of variety of plant species.	5 4
Emergent Wetland	Wetland dominated by non-woody herbaceous plants. Water level ranges a few inches to a few feet; it includes shallow and deep marshes based on depth of water. This type of wetland can support a large variety of wildlife, including some mammals, waterfowl, amphibians, etc. Deeper water areas can support populations of fish.	Good High variety of plant and wildlife species and stable water regime. Fair Lower number of plant species, sometimes a monoculture. Supports a lower number of animals and can have a seasonal water regime. Can contain significant number of invasive species.	4 3
Wet Meadow	These open meadow areas can support a variety of songbirds as well as other animals.	Good Variety of plant species and high diversity of wildlife. Fair Monoculture of plant species.	3 2

3.2 Woods

Many of the mature forested areas in Victor can be found on steeper slopes likely because steep areas are much harder to farm and develop. Wooded areas create quality and unique resource environments. Younger forested areas usually are found on abandoned farm fields emerging from successional meadows. These younger forests in the first stages of development contain mainly fast growing trees such as Poplar, Green Ash and Maple species. While they have some habitat quality, they are not ranked as high as a mature woods. The table on the following page includes the rankings for woods.

Woods	Descriptions and Values	Quality	Ranking
Mature Trees	The majority of the trees are mature hardwoods over 30 years old. There is usually minimal ground cover or understory due to the shade from the trees. Examples of vegetation which might be observed on the ground include Fern species, Trillium, May Apple and Spice Bush. This community is a great habitat for various wildlife including mammals, birds, amphibians and reptiles.	Good Quality (mature healthy trees, large variety of species). Fair Quality (mature trees of limited variety, softwoods. Could be damaged).	4 3
Mix- Mature and Young Trees	These woods are a mix of mature and young trees. These are usually woods with more of an understory of tree saplings, shrubs and herbaceous species.	Good Quality (healthy woods, large variety of species). Fair Quality (limited variety of species, softwoods. Could be damaged).	3 2
Young Trees	Young woods have a more substantial thick understory with tree saplings, shrubs and herbaceous species.	Good Quality (healthy young trees, large variety of species). Fair Quality (limited variety of trees, softwoods. Could be damaged).	2 1

3.3 Steep Slopes

Steep slopes are an important and sensitive resource. The Steep Slope Policy in Section 15 of NRI Volume 2 includes a detailed model for assessing the potential significance of steep slopes. This model takes into account a comprehensive array of factors associated with slope including height, steepness, stability, soil and bedrock, vegetative cover, wildlife habitat, co-occurrence/diversity, and hydrological features.

The Co-occurrence analysis relies upon a simpler model, based primarily upon slope. In general, the steeper the slope, the more susceptible to erosion. Heavily vegetated steep slopes are typically less susceptible to erosion than a steep slope with little or no vegetation, due to root systems that keep soils stable. Soil types determine the level of erodibilty.

Slopes	Slope Description and Value	Ranking
>30%	Severe slopes with high potential for erosion if disturbed.	3
15-30%	Steep slopes with moderate potential for erosion if disturbed.	2
10-15%	Moderate slopes with potential for erosion if disturbed.	1

3.4 Streams

NYSDEC uses letter descriptors to classify streams based on their water quality and best use. Vol 1, Section 2.2 Nearly all waters in New York State are assigned a letter classification such as A, B and C. Best uses include: source of drinking water, swimming, boating, fishing, and shellfishing. Of highest importance and most protected are streams classified as AA, A, B, C(T) and C(TS).

The C(T) (trout habitat, T) and C(TS) (trout spawning, TS) streams in the Town of Victor are high quality, important for their water quality and stream conditions that provide valued fish habitat. The stream conditions include (but are not limited to) cold, clear water, high dissolved oxygen, gravelly substrate for spawning, vegetated banks and riparian areas for filtering run off and shading the water surface, and other water chemistry-balanced conditions of pH, alkalinity and dissolved nutrients. The headwaters' riparian zones of all streams need protection in order to minimize water quality impacts. Impacts can include stormwater runoff from roads, agricultural fields, buildings and parking lots. Impacts can also be from erosion from bankfull channel flow creating turbid and warmer waters. A good riparian zone along these streams and maintaining the sub-watershed hydrology of these headwaters will have a positive, sustainable effect on stream habitat.

The better water quality a stream has, the more likely it will inhabit a larger variety of fish and other species. A critical aspect to stream health is its flow. Stream flow can have a direct affect on the amount of oxygen in the water (dissolved oxygen), the temperature of the water and siltation (turbidity). A stream whose average daily flow has considerable velocity with riffles (areas where water become aerated because of rapid flow over rocky substrates) will increase the oxygen level and provide more diverse habitat than a slow moving stream with lower oxygen levels, warmer water and a more silted bottom such as man-made or ditched stream channels. These will generally have more silt and less hydrological functions such as flood prevention.

Stream Classification	Stream Descriptions and Value	Ranking
AA,A,B	These streams have very clean water used for drinking and/or swimming.	5
C(T) & C(TS)	These streams are quality streams able to support trout population and provide conditions for trout spawning.	4
C- Natural	These are all other natural streams.	3
C- Ditch	These are man-made ditches usually for drainage purposes.	1

3.5 Floodplains

Floodplains are associated with a stream or river. Those of significant size on either side of the stream or river are usually regulated under Federal Emergency Management Agency; (FEMA). Those along smaller streams, where the floodplain area may be only two or three feet wide, are unregulated. In these instances, floodplains are of quality for the many functions and values they bring to an ecological and public community. Depending on the duration of flooding, floodplains can have great biodiversity and create great wetland communities.

Wetland floodplains are considered a high quality floodplain. These wetlands function to slow down, filter and cleanse the flood waters. By storing flood water, these wetlands reduce the potential of flooding of public and private properties, improve the water quality, reduce erosion, and create a good habitat for aquatic and terrestrial wildlife.

Upland floodplains also have for the surrounding communities. However, they may not have as many good qualities and values as a wetland floodplain might, especially for wildlife and water quality.

Floodplain	Floodplain Description and Value	Ranking
Floodplains mapped by FEMA	These floodplains are of high importance and therefore mapped by the Federal Emergency Management Agency. These are usually present within more substantial waterways.	2
Floodplains *not* mapped by FEMA	These are floodplains of smaller scale but important. Usually on smaller watercourses and within smaller watersheds.	1

4.0 Watersheds as Geographic Subsets

A watershed is defined topographically by the highest elevations that drain into a particular stream, river or lake. The land that water flows over and through on its way to a stream or other waterbody is called a watershed. A large watershed may have a number of subwatersheds. Each subwatershed is the land that drains to the waterbody of the main watershed. These subwatershed

areas are named for the secondary tributaries that flow into the main watershed waterbody. For example, Sucker Brook is a subwatershed of Great Brook. The land that collects water that feeds Sucker Brook flows into Great Brook.

Additional background information on Watersheds is found in Volume 1, Section 2.2.

Since streams represent a primary natural resource in Victor and are typically associated with other significant natural resources that together form co-occurrences, watershed boundaries are used as an indexing system that describe, in part, the geographic location of listed co-occurrence areas. There are two major watersheds (Central Lake Ontario Irondequoit –Nine Mile Watershed and Finger Lakes Upper Seneca River Watershed) that contain several sub-watersheds. The following watersheds and their sub-watersheds are described below:

4.1 Central Lake Ontario Irondequoit –Nine Mile Watershed

This watershed comprises the northwest portion of the Town of Victor and can be divided into two major sub-watersheds: Irondequoit Creek and White Brook. Irondequoit Creek originates in West Bloomfield and flows through the Town of Mendon to the Town of Victor in the northeast corner. White Brook originates in the Town of Victor and flows into Irondequoit Creek in the Town of Perinton, well north of the Town of Victor limits and then to Irondequoit Bay becoming part of the large Lake Ontario drainage basin.

4.1.1 Irondequoit Creek (IC)

This sub-watershed in the Town of Victor contains a portion of the main stem of Irondequoit Creek and five of its tributaries. IC is regarded as a very valuable stream, well known for its good resident trout population and reported by the Department of Environmental Conservation (NYSDEC) as a prime rainbow trout (steelhead) stream in New York State. Each year the State stocks steelhead and brown trout. Monroe County also stocks brown trout in the portion of Irondequoit Creek within Powder Mills Park (just north of the Victor Town-line), and released and wild brown trout are found upstream of the Park in the Town of Victor. The natural resource value of this creek is also demonstrated through research done by William L. Sutton and described in the NYSDEC published report “Biologic Stream Assessment of Irondequoit Creek and Two Tributaries, Thomas and Allen Creeks.”
http://www.worldcat.org/title/biological-stream-assessment-of-irondequoit-creek-and-two-tributaries-thomas-and-allen-creeks-monroe-county-new-york/oclc/41972590

The two sites on the creek in the Town of Victor that were studied, Main Street Fishers and Railroad Mills Road at Audubon Sanctuary, had the most richness and diversity of aquatic organisms (indicators of stream health) of all sites studied along the creek.

The main stem of Irondequoit Creek is classified as a C(TS). Classification C indicates a best usage for fishing. TS represents Trout Spawning. It is the only stream ranked this high within the Town of Victor. The five other tributaries to Irondequoit Creek are classified as C(T), where T represents Trout habitat. These creeks are highly regulated by NYSDEC and US Army Corps of Engineers. The remaining streams in Victor are Class C and are regulated by the US Army Corps of Engineers.

Trout populations can survive only in cold water, rich in oxygen, and Irondequoit Creek's trout population depends on continued protection of its cold water supply from the upper reaches in Victor and neighboring Towns of West Bloomfield and Mendon. The 12 square miles of lands in the Town of Victor which drain to Irondequoit Creek represent a substantial portion of its upper watershed. At the point where it leaves Victor, IC watershed drains almost 40 square miles. **It is essential that undisturbed stream corridors are maintained with extensive vegetated buffers to 1) stabilize streambanks minimizing erosion and 2) shade the water surface preventing thermal pollution.**

There are sixteen (16) surveyed co-occurrences identified in this watershed (see Section 7.0 below).

4.1.2 White Brook (WB)

This sub-watershed is located in the northeast corner of the Town of Victor and includes both Spring Creek and White Brook. Both are Class C streams. These streams flow through unique co-occurrence areas. They flow through active farmlands, pastures and meadows before they leave Victor and have good stream corridors (well vegetated and undisturbed) for most of their length, which should be preserved.

There are seven (7) surveyed co-occurrences in this watershed.

4.2 Finger Lakes Upper Seneca River Watershed

This watershed comprises the southeast portion of the Town of Victor. The sub-watersheds are: Ganargua Creek, Great Brook, Fish Creek and Sucker Brook. This watershed discharges further east into Lake Ontario at Oswego.

4.2.1 Ganargua Creek (GC)

This sub-watershed is in northeast portion of the Town of Victor. The streams and its tributaries within this sub-watershed are Class C. Ganargua Creek originates in the Town of South Bristol. There are five (5) surveyed co-occurrences in this watershed.

4.2.2 Great Brook (GB)

Two named tributaries of Great Brook flow in a northeasterly direction into the Town of Victor in the southwest corner: Trout Brook and Sucker Brook. Trout Brook is a named tributary within the Great Brook sub-watershed and is the second largest sub-watershed in the Town of Victor after Irondequoit Creek. It has only Class C streams within its boundary. It receives waters from large areas of farmed fields south and north of Boughton Hill Road.

The NYSDEC waterbody inventory data sheet for Great Brook states (revised 8/15/2007):

> *"Aquatic life support and recreational uses in Great Brook are thought to be impaired by low dissolved oxygen the result of urban runoff and other primarily nonpoint sources. Municipal wastewater discharges are also thought to contribute to water quality impacts. A biological (macroinvertebrate) assessment of Great Brook in Victor (at Maple Avenue) was conducted in 2001. Sampling results indicated moderately impacted water quality conditions. Silt and sedimentation was evident in the stream and considerable trash and other urban runoff impacts were also noted. Sampling at an alternate site downstream of the Village of Victor WWTP conducted in 1996 also found moderately impacted conditions. At the time, sewage effluent was identified as the cause of the impacts. Since this sampling the Victor WWTP has completed an upgrade of the plant and is currently meeting permit discharge limits. Due to the length of time since it was last sampled, conditions regarding the sewage impacts should be verified. (DEC/DOW, BWAM/SBU, June 2005)."*

There are four (4) surveyed co-occurrences in this watershed.

4.2.3 Sucker Brook (SB)

This is the smallest sub-watershed in the Town of Victor located near the Town's southern limits. The streams within this sub-watershed are all Class C. There is only one (1) co-occurrence within this watershed.

4.2.4 Fish Creek (FC)

The Fish Creek sub-watershed is located in the southeast corner of the FLUSR watershed and the southeast corner of Victor. There is one regulated C(T) stream in the southeast corner of this sub-watershed. The remaining streams are Class C streams. There are seven (7) surveyed co-occurrences in this watershed.

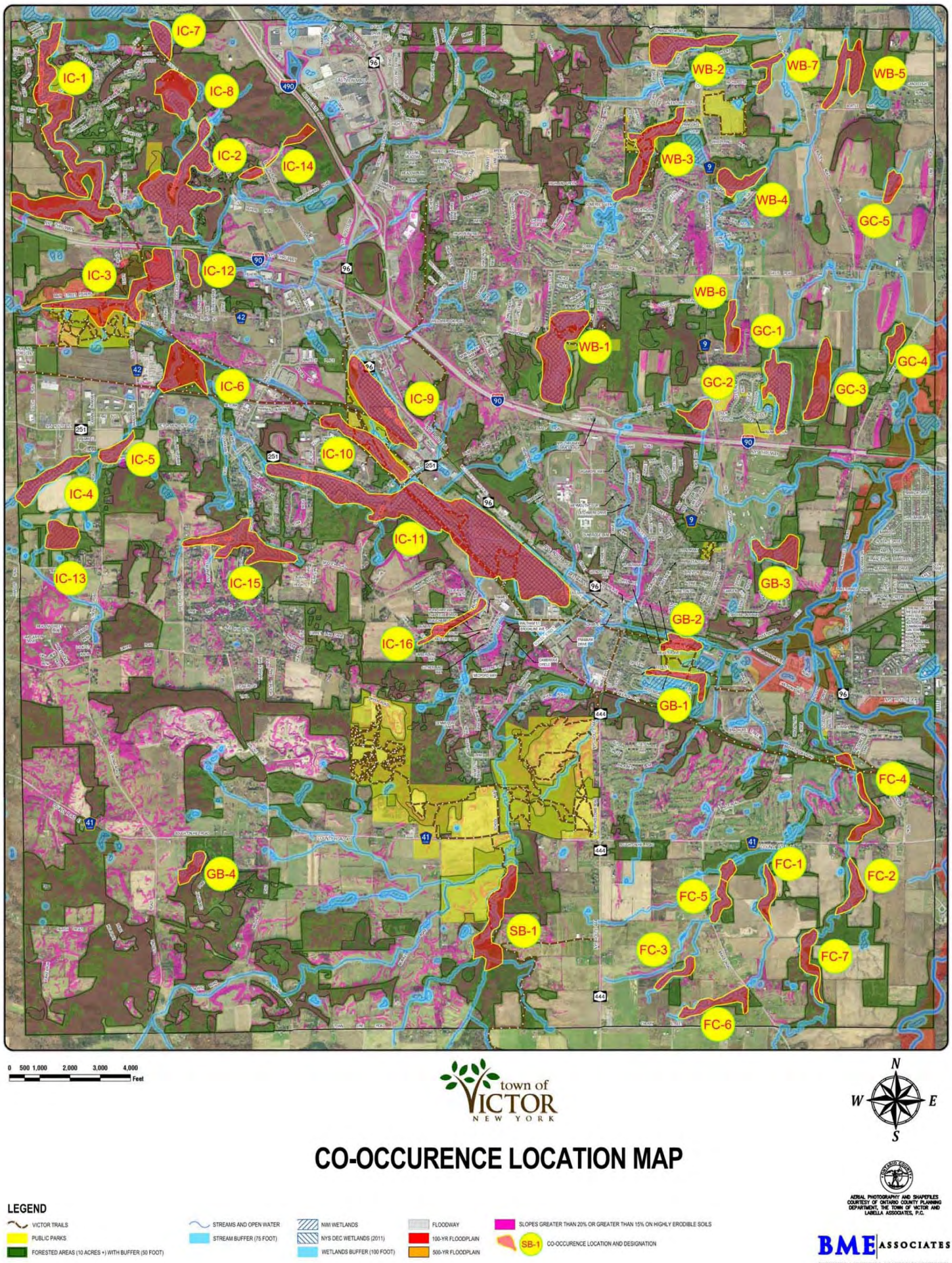
5.0 Co-occurrence Ranking Summary

Co-Occurrence Ranking Summary

Sorted by Watershed

	Wetlands	Woods	Slopes	Streams	Floodplain	Total	Max score
IC-1	4	4	3	4	2	17	19
IC-2	4	4	3	4	2	17	19
IC-3	4	2	1	4	2	13	19
IC-4	4	2	--	4	1	11	16
IC-5	4	2	--	4	2	12	16
IC-6	4	4	3	4	2	17	19
IC-7	3	3	3	3	--	12	17
IC-8	4	4	3	3	--	14	17
IC-9	4	2	--	3	1	10	16
IC-10	3	2	--	3	1	9	16
IC-11	4	3	--	3	1	11	16
IC-13	5	3	2	3	1	14	19
IC-15	4	4	3	3	1	15	19
IC-16	4	3	2	3	1	13	19
WB-1	4	3	1	3	1	12	19
WB-2	4	4	--	3	1	12	16
WB-3	5	4	3	3	1	16	19
WB-4	4	3	3	3	1	14	19
WB-5	4	3	3	3	1	14	19
WB-7	3	2	--	3	1	9	16
SB-1	4	4	3	3	1	15	19
GB-1	3	2	--	2	1	8	16
GB-2	3	1	--	3	1	8	16
GC-1	4	3	3	3	1	14	19
GC-3	5	4	3	2	1	15	19
FC-1	4	1	--	3	1	9	16
FC-3	4	3	2	3	1	13	19
FC-4	2	4	3	3	1	13	19
FC-5	3	1	--	3	1	8	16

6.0 Co-occurrence Map



7.0 Co-occurrence Inventory

The following pages present the inventory of co-occurrence areas based on the results of field surveys and information obtained from other resources. The co-occurrence sites are organized by individual sub-watersheds using the watershed's initials' as the primary identifier.

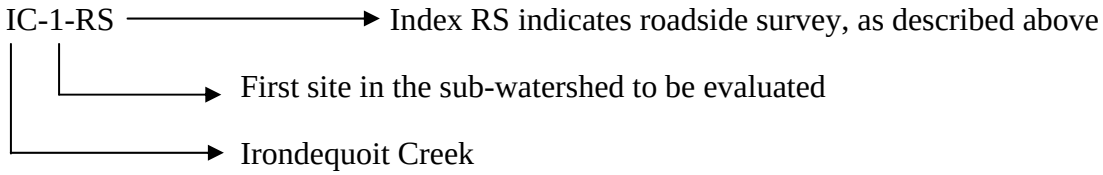
To document the level of evaluation, each co-occurrence area was next given an index number between 1and 3 based on the level of survey performed on the particular co-occurrence. Not all property owners gave permission for a field visit to occur on their land, so some of the areas are indicated as "Roadside Survey" or "No Survey," as described below:

Index **FS: Full Survey** - the description and ranking for this co-occurrence area is based on a full field survey based on field observations.

Index **RS: Roadside Survey** - a partial field survey was conducted for this co-occurrence area since full access was not granted by one or more landowners. The ranking to these co-occurrences are based on the limited coverage of the field surveys. Some of these sites were not ranked if only a small portion of the site was accessible.

Index **NS: No Survey** - a field survey was not permitted by landowners for this site. The information within these descriptions is solely based on observations from road side surveys, mapping information and information provided by the Town.

Sample:



7.1 Irondequoit Creek

IC-1-FS

Location: Along Irondequoit Creek in the northwest corner of the Town of Victor, south of Powder Mills Park, north of I-90 (NYS Thruway), west of Fisher Road, and both north and south of Railroad Mills Road.

This co-occurrence is approximately ±131 acres in size and contains 5 resources: Wetlands, Woods, Slopes, Streams and Floodplains.

Wetlands
All three wetland types exist along Irondequoit Creek (wooded, emergent wetland and wet meadow – see Section III A. for wetland descriptions). There is also an emergent wetland on the adjacent Auburn Trail's west side at the toe of a steep slope (see photo below). This wetland is likely the result of impoundment by the former railroad embankment that is now the Auburn Trail. Some invasive plant species such as Common Reed (Phragmites) and Black Swallow-wort were found within this co-occurrence. Native plant species observed throughout this area include: Jewelweed, Cattail, Horsetail, Soft Rush, Green Bulrush, Joe-Pye Weed, Boneset and Grey, Silky and Red-Osier Dogwood.



Emergent wetland with adjacent wooded steep slopes

Woods
The mature woods within this co-occurrence are located on steeper slopes. The species within these wooded steep slopes include Red Maple, Sugar Maple, Green Ash, Musclewood, Shagbark Hickory, and Red Oak.

Slopes
There are steep areas mostly wooded along the edges of the Irondequoit Creek floodplain. These slopes are over 20%, with some slopes over 30%.



Wooded slope area along wetlands

Streams

The stream is a Class C(TS), and is over 15 feet wide with many riffle areas and several deep pools over 6 feet deep. The value of this stretch of stream cannot be over emphasized for its dense riparian corridor and corresponding diverse aquatic habitat.



Deep pool on Irondequoit Creek with banks stabilized with stone

Floodplain

There is a significant floodplain along this stream mapped by the Federal Management Emergency Agency (FEMA).

Rating

Resource	Ranking
Wetlands	4
Woods	4
Slopes	3
Streams	4
Floodplain	2
Total	**17**

IC-2-FS

Location: IC-2 is located on both sides of Log Cabin Road and Lower Fishers Road between Benson Road and NYS Route I-90.

This co-occurrence is approximately 90 acres in size and contains several different resources including State and Federal wetlands, streams Class C, C(T) and C (TS), floodplains and woods, as well as steep slopes along the wetland areas. The combination of natural resources makes this site environmentally sensitive and important to protect.

Wetlands
The wetlands within this co-occurrence area are located on both sides of Log Cabin and Lower Fishers Road and total approximately 70 acres. There is a variety of high quality different wetland types including a cedar swamp, emergent wetlands with open water (at the intersection of Log Cabin Road and Lower Fishers Road) and wet meadow. This wide variety of wetlands provides great habitat for wildlife.



Cedar Swamp on the west side of Lower Fisher Road

Woods
The majority of the wetlands are bordered by well-established mature woods on steep slope areas. These woods stabilize the steep areas while providing habitat for a variety of plant and animal species. They serve, along with the wetlands, as a valuable wildlife corridor. The woods are comprised of Musclewood, American Beech, Red Oak, Maple species, etc.

Slopes
There are several wooded steep slopes along the wetlands exceeding 30%.



Wooded steep slope on the east side of Lower Fishers Road just above high quality wetland.

Streams
There are three major streams within this co-occurrence: Irondequoit Creek and two other tributaries to Irondequoit Creek. These streams fall into the Class C, C(T) and C(TS) NYSDEC classification. The banks of the streams are heavily vegetated and in good condition. The riparian buffer of these streams is generally a high quality wetland floodplain or vegetated upland areas. The Class C stream is a tributary located to the west/northwest of Log Cabin Road; the stream Class C(T) tributary is located south of Lower Fisher Road which continues to flow north under Lower Fishers Road and Log Cabin Road to where it ties into Irondequoit Creek, which is classified as a Class C(TS) stream. These tributaries have a vegetated stream corridor providing for good water quality for trout habitat, including cool temperatures, clean water and a good water flow providing aeration/oxygen needed by trout. These streams are very important as headwaters to Irondequoit Creek. This good quality wetland floodplain produces a rich spectrum of wetland plants. There were crayfish and amphibians observed in both tributaries at the time of the survey. Preservation of the stream corridors is essential for success of trout population and health of the streams.

Floodplain
Most of the co-occurrence area is mapped floodplain by FEMA.

Rating

Resource	Ranking
Wetlands	4
Woods	4
Slopes	3
Streams	4
Floodplain	2
Total	**17**

IC-3-FS

Location: IC-3 is located south of Route I-90 between Fisher Road, and the southwest corner of Wangum Road and Main Street Fishers west towards the Town of Victor limits. A portion of this co-occurrence can be observed from the Auburn Trail.

This co-occurrence is approximately 66 acres in size and contains five resources: Wetlands, Streams, Floodplains, Woods, and some Slopes.

Wetlands
The wetlands observed are wooded wetlands, shallow emergent wetlands, and wet meadows. They consist of mainly herbaceous wetland vegetation with some shrubs and trees. They are typical floodplain wetlands of a good quality.



Emergent marsh opening within wooded wetland

Woods
The woods are mature species which include Red and White Oak, Maple species, Shagbark Hickory, Ash, etc.

Slopes
Some steep slopes within this co-occurrence are located along the stream's floodplain, NY State Route 90 and Log Cabin Road. They are also located in the woods north of Main Street Fishers.

Streams
The tributaries within this co-occurrence are Irondequoit Creek Class C(TS) and a portion of tributary Class C(T). Irondequoit Creek is approximately 20-30' wide with some 3-4' deep areas.



Irondequoit Creek with adjacent floodplain wetlands

Floodplain
The floodplain is very important as it receives a large volume of floodwater from Irondequoit Creek, and therefore is mapped by FEMA. It is located within the adjacent wetlands to the creek south of Route 90, east of the Auburn Trail.

Rating

Resource	**Ranking**
Wetlands	4
Woods	2
Slopes	1
Streams	4
Floodplain	2
Total	**13**

IC-4-FS

Location: IC-4 is located ±250 feet west of Strong Road, east of the Town of Victor limits, and ±1,600 feet south of NYS Route 251 (Victor-Mendon Road), along an unnamed trout tributary.

This co-occurrence is approximately 26 acres in size and contains 5 resources: Wetlands, Woods, Slopes, Streams, and Floodplains.

Wetlands
The wetlands of this co-occurrence are wooded. There are several vernal pools and drainage patterns throughout the wetlands. The dominant plant species include Green Ash, Red Maple, Stinging Nettle, Jump Seed, Goldenrod species, and Aster species in wetland open areas. This wetland receives floodwater as indicated by watermarks on the trunks of the trees. The ground surface contains little to no vegetation, which also indicates seasonal flooding of this wetland as the ponding water prevents understory vegetation from growing.



Wooded wetlands (swamp) with marks of high water.
It could serve as vernal pond in the spring.

Woods
The woods within this co-occurrence are generally younger than 30 years. Dominant species are Green Ash, Red Maple, and American Elm.

Streams
The stream within this co-occurrence is Class C(T). The width of the streams is only 3-6' with some small pools. Stream corridors within this co-occurrence are heavily vegetated, which is important as the vegetation provides shade and keeps the stream cool.

Floodplain
The floodplain of this co-occurrence is located mostly within the adjacent wetlands and is mostly dense with woody plant species.

Rating

Resource	Ranking
Wetlands	4
Woods	2
Streams	4
Floodplain	1
Total	**11**

IC-5-RS

Location: IC-5 is located north of Shire Lane, east of Strong Road, and south of Victor Mendon Road (NYS Route 251).

This co-occurrence is approximately 12 acres in size and contains 4 resources: Wetlands, Streams, Floodplains, and Woods.

Wetlands
The wetland of this co-occurrence is a wooded wetland. Species within the wetland include Quaking Aspen, Green Ash, Red Maple, Silky and Grey Dogwoods, Sensitive Fern, etc. The woods provide valuable buffer of this trout stream, which is an important tributary to the Irondequoit Creek.



Forested wetland with younger trees and thick shrub understory

Woods
The survey revealed mostly younger and some mature trees. The trees are generally softwoods including Poplar species, Green Ash, and Willow species.

Streams
The stream within this co-occurrence is a Class C(T). It runs through vegetated floodplain wetlands. It is an important, good quality headwater stream to Irondequoit Creek.

Floodplain
Floodplain is located within the wetlands.

Rating

Resource	**Ranking**
Wetlands	4
Woods	2
Streams	4
Floodplain	2
Total	**12**

IC-6-FS

Location: IC-6 is located south and east of County Route 42, ±1,500 ft. north of Victor Mendon Road.

This co-occurrence is approximately 38 acres in size and contains 5 resources: Wetlands, Woods, Slopes, Streams, and Floodplains.

Wetlands
The wetlands of this co-occurrence observed were floodplain wooded areas with some vernal pools. These stream corridor wetlands are important for water quality, thermo regulation of water and wildlife habitat.

Woods
The woods of this co-occurrence are mature and of great quality and variety. The woods include Red Oak, Hickory species, Maple species, American Basswood, and American Beech. There are some young trees in the mix with mature trees 40 years to 100 years old.

Slopes
There were steep slopes within the woods that exceeded 30%.



Mature woods with variety of species in upland area.

Stream

The stream within this co-occurrence is a Class C(T). It is shallow, but fast moving with a good substrate of gravel and rock. The water is clear and cold, creating good habitat for trout.



Irondequoit Creek tributary with small wetland floodplain
and adjacent wooded steep slopes

Floodplain

The floodplain of the stream is generally a wooded wetland or upland on either side of the stream.

Rating

Resource	Ranking
Wetlands	4
Woods	4
Slopes	3
Streams	4
Floodplain	2
Total	**17**

IC-7-FS

Location: IC-7 is located east of Fisher Road, northeast of Benson Road, and west of Interstate 490.

This co-occurrence is approximately 13 acres in size and contains 4 resources: Wetlands, Woods, Slopes, and Streams.

Wetlands
The wetland area of this co-occurrence is associated with a kettle lake named Crossman's Pond. It is deep in some areas; shallow areas are dominated by Cattail species with smaller areas with a larger variety of wetland plants.



Portion of Crossman's Pond is an emergent wetland.
Wooded steep slopes are surrounding the pond.

Woods
The woods are mature and surround the pond/wetland area. The woods contain hardwood species, as well as softwood species including American Ash, Poplar species, etc.

Slopes
The slopes of this co-occurrence exceed 30% and are wooded.

Streams
The Class C stream is located at the north of the co-occurrence and flows outside of the Town of Victor limits.

Rating

Resource	Ranking
Wetlands	3
Woods	3
Slopes	3
Streams	3
Total	**12**

IC-8-FS

Location: IC-8 is located ±1,000 ft. east of Hidden Oaks Drive and adjacent to Benson Road on the west side.

This co-occurrence is approximately 36 acres in size and contains 4 resources: Wetlands, Woods, Slopes, and Streams.

This co-occurrence area has three separate wetland ponds, which are identified as kettle lakes. This co-occurrence also includes wooded steep slopes. There is an intermittent stream at the south end of the largest kettle lake.

Wetlands
The wetlands of this co-occurrence are associated with the kettle lakes and a small open water pond adjacent to Benson Road. Dominant plant species identified in wetland areas included Cattail species and Skunk Cabbage. An abundance of amphibians and turtles was observed.



Small kettle lake / emergent marsh covered with aquatic species



Cattail emergent marsh surrounded by mature woods and steep slopes

Woods
The woods of this co-occurrence area are mature and of high value. The tree species include Red Oak species, Maple species, Hemlock, Witch Hazel and Spice Bush. The majority of the ground cover is represented by Fern species.

Slopes
The slopes of this co-occurrence exceed 30%. and are covered with mature woods.



Mature woods with steep slopes

Streams
This intermittent (flows only seasonally) stream is Class C. It is a tributary to Irondequoit Creek. It receives runoff from adjacent wooded slope areas.

Rating

Resource	Ranking
Wetlands	4
Woods	4
Slopes	3
Streams	3
Total	**14**

IC-9-FS

Location: IC-9 is located west of Route 96, southeast of Omnitech Place and northeast of NYS Route 251.

This co-occurrence is approximately 59 acres in size and contains 3 resources: Wetlands, Streams, and Woods.

Wetlands
The wetland of this co-occurrence is an emergent marsh and is a forested wetland. It has great flood control and water quality value as it receives stormwater runoff from adjacent roads and developed areas. Portions of this co-occurrence are infested with Common Reed (Phragmites), but otherwise there is a good diversity of wetland plants.



Emergent marsh with open water areas and growth of Common Reed.

Woods
The wooded area of this co-occurrence is located at the northwestern portion of the co-occurrence. There is a good diversity of tree species such as Quaking Aspen, Tamarack, Green Ash, Red and Silver Maple, Cedar and Hemlock.

Streams
The stream is a Class C and runs through wetland floodplain. It has a good vegetated corridor.

Floodplain
There is a substantial floodplain located in the wetland areas.

Rating

Resource	Ranking
Wetlands	4
Woods	2
Streams	3
Floodplain	1
Total	**10**

IC-10-FS

Location: IC-10 is located ±1,000 feet northeast of Victor Heights Parkway and northwest from NYS Route 251.

This co-occurrence is approximately 37 acres in size and contains 4 resources: Wetlands, Woods, Streams, and Floodplains.

Wetlands
The wetlands of this co-occurrence are an emergent marsh and partially forested wetland. This wetland provides floodwater storage and water quality treatment. Sections of the wetland are infested with Common Reed (Phragmites), but there is also a good diversity of wooded tree species such as Quaking Aspen, Tamarack, Green Ash, Red Maple, Cedar and Hemlock. Other plant species within this wetland are Jewelweed, Cat-tail, Green Ash, Silky and Red-Osier Dogwoods, Yellow Iris and Boneset.



Floodplain emergent marsh with forested wetland in the background

Woods
The wooded area of this co-occurrence is located at the northwestern portion of the co-occurrence. There is a mix of young and mature tree species including Red and White Oak, Cottonwood, Green Ash and Maple species.

Streams
The stream is a Class C and is in good condition.

Floodplain
The floodplain is located within the wetlands adjacent to the stream.

Rating

Resource	**Ranking**
Wetlands	3
Woods	2
Streams	3
Floodplain	1
Total	**9**

IC-11-FS

Location: South of NYS Route 96, northwest of School Street and running northwesterly under Cork Road and along the south side of NYS Route 251. The Auburn Trail runs through this site.

This co-occurrence is approximately 252 acres in size and contains four resources: Wetlands, Streams, Woods, and Floodplain. This is the largest of all co-occurrence areas.

Wetlands
The largest, NYSDEC regulated wetland of this co-occurrence is an emergent marsh and partially forested wetland. Its location along the commercial portion of NYS Route 96, have put development pressure on the wetland and its buffer. This wetland provides significant flood control and water quality treatment. Sections are infested with invasive Common Reed, though there is great diversity of desired wetland plant species in other areas.



Emergent floodplain marsh

Woods
The wooded section of this co-occurrence is in good condition and includes a mix of young and mature species. Species include Quaking Aspen, Green Ash, Red Maple, Sugar Maple and Red and White Oak.



Wooded wetland with younger trees and a herbaceous understory

Streams
The stream receives stormwater runoff from large developed areas and is a Class C tributary of Irondequoit Creek. In some areas the stream channel is poorly defined allowing it to spill over into the adjacent wetlands creating good water balance.

Floodplain
The floodplain of this co-occurrence is of significant size and therefore likely provides important flood control to downstream neighborhoods.

Rating

Resource	**Ranking**
Wetlands	4
Woods	3
Streams	3
Floodplain	1
Total	**11**

IC-12-RS

Location: IC-12 is located ±150 feet south of Route 90 (NYS Thruway), ±300 feet east of Log Cabin Rd., and ±800 feet north of Main St. Fishers (County Road 42).

This co-occurrence is approximately 11 acres in size and contains 3 resources: Wetlands, Woods, and Slopes.

Wetlands
These emergent wetlands are within or along the kettle lakes.

Woods
Mix of softwoods and hardwoods.

Slopes
There are steep slopes exceeding 30%.

IC-13-FS

Location: IC-13 is located ±600 feet north of Taylor Road and ±750 feet west of Strong Rd.

This co-occurrence is approximately 20 acres in size and contains 4 resources: Wetlands, Woods, Slopes, Stream and Floodplain.

Wetlands
The wetlands within this co-occurrence are forested areas which are seasonally flooded. There are several vernal pools and drainage patterns within this wetland area making it a good habitat for amphibians and other animals. The soils within the wetland have high organic content.



Wooded wetland with standing water.
Good habitat for amphibians (vernal pools)

Woods
The woods are younger with some mature trees. Species include Red and Silver Maple, White Oak, Green Ash, Musclewood, Buckthorn and Black Cherry.



Mature and young woods with minimal understory
adjacent to emergent wetlands

Slopes
Most of the slopes within some wooded areas are over 15% (some over 30%).



Wooded area with intermittent stream/seep

Stream
The stream within this co-occurrence is Class C and feeds into the Class C(T) stream, just north of this co-occurrence. It is approximately 4'-6' wide with high banks. There are several seeps on the slopes feeding the stream.

Floodplain
There are floodplain wetland areas adjacent to the stream. The wooded wetlands retains a lot of water in the spring.

Rating

Resource	Ranking
Wetlands	5
Woods	3
Slopes	2
Streams	3
Floodplain	1
Total	**14**

IC-14-RS

Location: On both sides of Benson Road, north of Lower Fisher Road, and southwest of Interstate 490.

This co-occurrence is approximately 11 acres in size and contains 4 resources: Wetlands, Woods, Slopes, and Stream.

Wetlands
The wetland of this co-occurrence is an emergent marsh. It is located west and east of Benson Road and north of Lower Fisher Road. To the south of this wetland is an open water man-made pond.

Woods
The woods are young in the lower portion. There are mature evergreens and hardwoods on the slopes along the upper wetland area near Route 490.

Slopes
There are steep slopes located within this co-occurrence that exceed 30%.

Stream
The stream within this co-occurrence is a Class C intermittent stream.

IC-15-FS

Location: IC-15 is located along Modock Road.

This co-occurrence is approximately 47 acres in size and contains 5 resources: Wetlands, Slopes, Steams, Floodplain, and Woods.

Wetlands
The wetlands for this co-occurrence were not mapped on Federal and State wetland maps. The wetlands are an emergent marsh with a large variety of wetland plant species.



Emergent high quality marsh with a variety of plant species



Emergent marsh with a variety of plant species

Woods
The woods outside of the wetland are good quality and mature including species of Maple, Red Oak, Hickory, and Green and White Ash.

Slopes
There are some slopes exceeding 30% located just outside of the wetland areas. The slopes are wooded.

Streams
The stream within this co-occurrence is shallow, but fast flowing. It is a Class C stream flowing into one of the C(T) tributaries.



Shallow stream with good quality wetland floodplain



Shallow stream with rocky substrate

Floodplain
The floodplain is located along the stream within the existing wetlands.

Rating

Resource	Ranking
Wetlands	4
Woods	4
Slopes	3
Streams	3
Floodplain	1
Total	**15**

IC-16-FS

Location: IC-16 is located east and west of Cork Road and south of Rawson Road.

This co-occurrence is approximately 12 acres in size and contains 4 resources: Wetlands, Woods, Streams, and Floodplain.

Wetlands
The wetlands of this co-occurrence are an emergent marsh and wooded wetland near Cork Road.



Emergent marsh pocket

Woods
The woods on the slopes along the wetland are species of Maple, Oak and Ash. There are Willow species, Tamarack, Green Ash and Silty Dogwood within the wetland limits.

Slopes
There are shorter steep slopes along the wetlands in several areas.

Streams
The stream of this co-occurrence is a smaller tributary flowing through the wetland area towards Rawson Road. The stream loses its definition in some places where it spills into wetlands.

Floodplain
There is a wetland pond in the upper area of this stream, which has some flood storage. The wetland towards Rawson Road has a limited floodplain function because of its steepness.

Rating

Resource	**Ranking**
Wetlands	4
Woods	3
Slopes	2
Streams	3
Floodplain	1
Total	**13**

7.2 Ganargua Creek

GC-1-RS

Location: GC-1 is located north of NYS Route I-90 and east of Duck Hollow Drive.

This co-occurrence is approximately 34 acres in size and contains 5 resources: Wetlands, Woods, Slopes, Streams, and Floodplains.

Wetlands
The wetlands in this co-occurrence is an emergent marsh with some shrub growth and vernal pools. This wetland includes areas with deeper water and contains a variety of wetland plant species. Amphibians, fish, and other animals were observed in abundance.



Emergent marsh with a variety of wetland plant species



Wooded wetland with standing water

Woods
The woods of this co-occurrence are a mix of young and mature species, including American Basswood and Maple species.

Slopes
The slopes of this co-occurrence exceed 30% and are located to the east.

Streams
The stream is not well defined within the wetlands.

Floodplain
The large floodplain area is located within the wetlands.

Rating

Resource	**Ranking**
Wetlands	4
Woods	3
Slopes	3
Streams	3
Floodplain	1
Total	**14**

GC-2-RS

Location: GC-2 is located north of I-90 at the southwest corner of Aldridge Road and County Road 9 intersection. Because this co-occurrence was only observed from County Rte. 9 and Aldridge Road, it was not ranked.

This co-occurrence is approximately 15 acres in size and contains 4 resources: Wetlands, Streams, Floodplains, and Woods.

Wetlands
The wetland within this co-occurrence is around an open man-made pond and along the tributary to the west in wooded area.



Overall photo of co-occurrence pond and wooded area behind it

Woods
Observations of the woods were from the road. The woods are mature of good quality.

Slopes
Steep slopes are located within the west portion of this co-occurrence.

Streams
Observations of the stream were not performed due to limited access.

Floodplain
Observations of the floodplain were not performed due to limited access.

Rating
A rating for this co-occurrence was not performed due to limited access.

GC-3-FS

Location: GC-3 is located ±1,000 feet north of I-90, ±2,000 feet west of Brownsville Road, and south of Gillis Road.

This co-occurrence is approximately 32 acres in size and contains 5 resources: Wetlands, Woods, Stream, Floodplain, and Slopes.

Wetlands
The wetlands of this co-occurrence are of high quality wooded wetlands. The soil is very organic with a good diversity of wetland plant species including Skunk Cabbage, Marsh Marigold, Rice Cut Grass, Sensitive Fern, Sedges and Rushes, Spice Bush, Silky Dogwood, Green Ash and Red Maple, which provides habitat for many animals, including amphibians.



Very diverse forested wetland with organic soils and moss on the ground floor

Woods
The woods in this co-occurrence are mature with dominant species including, Sugar, Red and Norway Maple, Hickory, Red Oak, and Musclewood.



Mature woods with minimal understory

Slopes
The steep slopes in this co-occurrence are over 20%. They are in good condition with solid growth of trees.

Streams
An intermittent stream is located in the northeast portion of the co-occurrence.

Floodplain
The wetland serves as a floodplain.

Rating

Resource	Ranking
Wetlands	5
Woods	4
Slopes	3
Streams	2
Floodplain	1
Total	**15**

GC-4-RS

Location: GC-4 is located West of Brownsville Road, ±3,000 ft. north of I-90.

This co-occurrence is approximately 10 acres in size and contains 3 resources including Wetlands, Woods, and a Stream.

Wetlands
The wetland within this co-occurrence range is a forested wetland to a meadow wetland.

Woods
These woods are over 30 years old and include Red Maple, Silver Maple, Green Ash and American Elm.

Slopes
It should be noted that this co-occurrence is adjacent to #5 of unique land forms from the NRI Phase 1 table, which is over 30% steep (north side of woods). Otherwise, land around the woods and wetland is flat.

Stream
The stream within this co-occurrence is a Class C stream. The banks are steep and about 2-4 feet high. The flow of the stream is slow and shallow. It is shown as intermittent on the State Wetland map.

Floodplain
The floodplain is located within the wooded wetland.

GC-5-NS

Location: GC-5 is located ±2000 feet south of Bortel Road, ±1800 east of Blazey Rd., ±2500 north of Gillis Road.

This co-occurrence is approximately 10 acres in size and contains 4 resources: Wetlands, Woods, Slopes, and Streams.

Wetlands
The wetlands of this co-occurrence are wooded.

Woods
There are mature woods within this co-occurrence and on adjacent steep slopes to the west.

Slopes
The steep slopes within this co-occurrence exceed 15%.

Streams
This Class C stream is intermittent.

7.3 Sucker Brook

SB-1-FS

Location: SB-1 is located south of Boughton Hill Road and west of Route 444.

This co-occurrence is approximately 44 acres in size and contains five resources: Wetlands, Woods, Slopes, Streams, and Floodplains.

Wetlands
The wetland in this co-occurrence is a good quality wooded wetland and emergent marsh. The wetland is located adjacent to Sucker Brook, approximately 10-50 ft. on either side. Part of this wetland is emergent marsh created from an old beaver pond on the "apple farm" site. This wetland is not mapped on either Federal nor State wetland maps. It is approximately 44 acres in size. This emergent marsh has a good variety of Sedge and Rush species with some shrub areas and deeper open water pools. It is very rich in diversity of habitats including open water, shallow marsh, deep marsh and woods in higher areas.



Emergent wetland beaver pond with standing water and a variety of wetland plant species

Woods
The species within the mature woods include American Basswood, Red Oak, Sugar and Red Maple, Musclewood, and Green Ash.

Slopes
The co-occurrence area includes steep slopes on either side of the floodplain wetland area of the stream. The steep slopes range from 15–35% in several areas.

Stream
The stream located in this co-occurrence area is a Class C stream. The substrate of this stream is rocky. It has several pools in its floodplain area. The flow of the stream ranges from slow/shallow to fast/shallow. The width of the stream varies from 3' wide to over 20' wide in some areas. Overall, this is good quality stream with excellent floodplain wetland areas along its sides.

Floodplain
The floodplain receives water from a fairly large watershed to the south.



Wooded wetland floodplain next to creek



Stream with emergent wetland floodplain

Rating

Resource	**Ranking**
Wetlands	4
Woods	4
Slopes	3
Streams	3
Floodplain	1
Total	**15**

7.4 White Brook

WB-1-FS

Location: WB-1 is located north of Aldridge Road, ±200 ft. south of Hackney Creek Drive.

This co-occurrence is approximately 69 acres in size and contains 5 resources including State and Federal Wetland, Slopes, Streams, Floodplains, and Woods.

Wetlands
The wetlands in this co-occurrence are wooded with emergent marsh in the center. These wetlands contain vernal pools and drainage patterns. Poplar species, Green Ash, Red and Silver Maple with Spice Bush understory are dominant species within the wetland areas. The emergent marsh is overgrown in some areas with invasive Reed Canary grass. Dogwood species, Skunk Cabbage, and Jewelweed are dominant species in most areas.



Emergent marsh with a variety of wetland plant species



Wooded floodplain wetlands

Woods
The woods of this co-occurrence are mostly mature with some younger trees along the wetland areas. They are in good condition including Green Ash, Red and Silver Maple, Red Oak, Black Cherry and Hickory.

Slopes
There are some areas of slopes of 10-20%.



A mix of young and mature woods with some vegetated understory on moderate slope

Streams
The stream within this co-occurrence is Class C and meanders through this wetland. The water quality of this stream with a good bottom substrate is good. It includes a larger pond at its northern end. It provides great habitat for animals, including waterfowl.

Floodplain
The floodplain is located within the wooded and emergent wetland areas.



Clear stream in floodplain wooded wetland area

Rating

Resource	Ranking
Wetlands	4
Woods	3
Slopes	1
Streams	3
Floodplain	1
Total	**12**

WB-2-RS

Location: WB-2 is located south of Spring Creek Drive north of Falcon's Point Road, and west and east of County Rte. 9.

This co-occurrence is approximately 35 acres in size and contains 4 resources including Wetlands, Woods, Streams, and Floodplains.

Wetlands
The wetlands of this co-occurrence are an emergent marsh with a rich variety of wetland species including Silky Dogwood, Red Osier Dogwood, Jewelweed, Skunk Cabbage, Yellow Flag Iris, Forget-Me-Not, Marsh Marigold, Green Ash, Red Maple, Silver Maple and Cat-tail species.



Emergent marsh and wooded area

Woods
The woods of this co-occurrence are mature with some young species. Green Ash, Maple and Oaks dominate the uplands perimeter wooded areas.

Streams
The stream is a good quality Class C stream and runs through the wetland.

Floodplains
The large floodplain is located within the wetlands.

Rating

Resource	Ranking
Wetlands	4
Woods	4
Streams	3
Floodplain	1
Total	**12**

WB-3-FS

Location: WB-3 is located west of Springdale Court, south of Valentown Road.

This co-occurrence is approximately 42 acres in size and contains 5 resources: Wetlands, Woods, Slopes, Streams, and Floodplains.

Wetlands
The wetlands within this co-occurrence are wooded wetlands. The wetlands are seasonally flooded and saturated. Vernal pools and drainage patterns were observed within the creeks floodplain. There are several groundwater seeps from slope areas, swells and wetland swales between the topography. These wooded wetlands contain mature trees.

Woods
The woods within this co-occurrence are mature, and include species of Oak, Basswood, Maple, Cherry, Ash and Hickory. Age of the majority of trees is 20-80 years old.

Slopes
The slopes of this co-occurrence are along the stream floodplain with a good growth of trees. Some of the slopes exceed 30%.



Wooded steep slopes



Stream with a wetland wooded floodplain

Streams
White Brook within this co-occurrence is Class C. The stream is flowing shallow/fast with several pools and a good gravel substrate. The riparian areas are excellent wooded wetlands or uplands. The stream within this co-occurrence is of a very good quality.

Floodplains
The floodplains of this co-occurrence are located in the adjacent wetland areas.

Rating

Resource	**Ranking**
Wetlands	5
Woods	4
Slopes	3
Streams	3
Floodplain	1
Total	**16**

WB-4-FS

Location: WB-4 is located north of Stone Leigh Trail, ±300 feet east of Victor Egypt Road.

This co-occurrence is approximately 18 acres in size and contains 5 resources: Wetlands, Woods, Streams, Floodplains and Slopes.

Wetlands
The wetlands within this co-occurrence include emergent marsh community with a good variety of wetland vegetation. The wetland is seasonally flooded.



Emergent marsh with standing water and a variety of wetland plant species



Emergent marsh with a variety of wetland plant species

Woods
The woods are located around the wetlands and provide a good buffer. The woods are younger with some mature species, including Red Oak and Red and Silver Maple.

Slopes
The steep slopes around the wetland include forested and some meadow communities. These slopes exceed 30% in some areas.

Streams
The Class C stream is shallow and slow flowing.

Floodplain
The stream's floodplain is located within the wetland.



Shallow slow flowing stream within a wetland floodplain

Rating

Resource	Ranking
Wetlands	4
Woods	3
Slopes	3
Streams	3
Floodplain	1
Total	**14**

WB-5-FS

Location: WB-5 is located north of Bortel Road and east of Blazey Road.

This co-occurrence is approximately 32 acres in size and contains 5 resources: Wetlands, Woods, Slopes, Streams, and Floodplain.

Wetlands
This wetland is adjacent to the existing drainage ways/tributaries. Some portions of this wetland contain mature trees but mostly a mix with younger trees.

Woods
The woods are located within the floodplain of the tributaries, as well as steeper slopes in the north end of this co-occurrence. The trees are a mix of mature and young species.

Slopes
The shorter steep slopes are located along the stream floodplain area and are 15%-20% slopes.

Streams
The stream is a Class C stream. The woods provide a good buffer to the stream.

Floodplain
The floodplain is located within the wetland.

Rating

Resource	Ranking
Wetlands	4
Woods	3
Slopes	3
Streams	3
Floodplain	1
Total	**14**

WB-6-NS

Location: WB-6 is located south of Victor Road and Gun Club West, ±1,500 ft. northwest of Settler's Run.

This co-occurrence is approximately 15 acres and contains 4 resources: Wetlands, Woods, Streams, and Floodplain.

Wetlands
This wetland is wooded with dense shrub cover.

Woods
The woods are a mix of young and some mature trees.

Streams
The stream is a Class C stream.

Floodplain
The floodplain is located within the adjacent wetlands.

WB-7-FS

Location: WB-7 is located east and west of Blazey Road, and north and south of Richardson Road.

This co-occurrence is approximately 11 acres and contains 4 resources: Wetlands, Woods, Streams, and Floodplain.

Wetlands
The wetlands observed are located on both sides of the stream. The wetland community is an emergent wetland.



Emergent wetland areas on either side of the stream

Woods
The wooded areas are mostly softwoods including Black Willow, Silver and Red Maples, and Green Ash.

Streams
The observed stream is Class C. The vegetation on the stream banks and adjacent areas gives the stream a good riparian buffer.



Stream with a good riparian buffer of vegetation and trees
Either side of this stream has low wetland areas

Floodplains
The floodplain is located within the low wetland areas.

Rating

Resource	**Ranking**
Wetlands	3
Woods	2
Streams	3
Floodplain	1
Total	**9**

7.5 Great Brook

GB-1-FS

Location: GB-1 is located ±1,500 ft. south of Route 96, ±1,500 ft. west of Brace Road, and north and east of Ketchum Street.

This co-occurrence is approximately 14 acres in size and contains 4 resources: Wetlands, Streams, Floodplains, and Woods.

Wetlands
This wetland is a wooded wetland which does not have a good variety of wetland species. It does have drainage patterns and possibly seasonal vernal pools.



Wooded Wetland

Woods
The woods are young to the north, and become more mature and undisturbed in the east area. Species include Green Ash, Maple species, Hickory, Black Cherry, and Red Oak.

Streams
The stream is a Class C stream. It is shallow, but fast moving. It receives drainage from developed areas.

Floodplain
Floodplain is located in wetland and upland areas.



Stream with adjacent wetland floodplain

Rating

Resource	Ranking
Wetlands	3
Woods	2
Streams	2
Floodplain	1
Total	**8**

GB-2-FS

Location: GB-2 is located ±400 ft. south of Route 96, ±2,000 ft. west of Brace Road.

This co-occurrence is approximately 13 acres in size and contains 4 resources: Wetlands, Streams, Floodplain, and Woods.

Wetlands
The wetlands within this co-occurrence are an emergent marsh and a wet meadow community. The marsh is with 6"-36" of water depth and open water areas. There is not a large variety of wetland plants in this community. The wet meadow is dominated by invasive Common Reed.



Emergent marsh with standing water

Woods
The woods are in fair condition with many younger trees and shrub species. The tree species are mostly soft woods, including Willow species, Cottonwood, and Green Ash.

Stream
The Class C stream has eroding banks in some areas. Very well defined; in some areas, banks are 6 ft. high.



Stream with steep banks and some erosion

Floodplain
The floodplain of this co-occurrence is located in wetlands adjacent to the stream, but also in upland areas.

Rating

Resource	Ranking
Wetlands	3
Woods	1
Streams	3
Floodplain	1
Total	**8**

GB-3-NS

Location: GB-5 is located ±1,300 ft. west of Brownsville Road, ±1,800 ft. east of Lynaugh Road, and ±700 ft. north of Trevor Run.

This co-occurrence is approximately 22 acres in size and contains 3 resources: Wetlands, Woods, and Slopes.

Wetlands
The wetland of this co-occurrence is an emergent wetland with some forested/shrub wetland areas and open water.

Woods
A wooded area is located to the south.

Slopes
The steep slopes are located within the wooded areas.

GB-4-NS (Cranberry Pond)

Location: GB-4 is located ±500 feet south of Boughton Hill Rd., ±1,100 feet east of Strong Rd., and adjacent to Cranberry Pond Trail to the West.

This co-occurrence is approximately 12 acres in size and contains 3 resources: Wetlands, Woods, and Slopes.

Wetlands
This pond contains emergent and forested/shrub wetlands.

Woods
The woods are mature.

Slopes
There are wooded slopes around the pond and wetland areas.

7.6 Fish Creek

FC-1-FS

Location: FC-1 is located ±1,200 feet South of Boughton Hill Road (County Road 41), ±1,800 feet east of Brace Road, ±2,500 feet southeast of Brace Road and Boughton Hill Road intersection.

This co-occurrence is approximately 13 acres in size and contains 3 resources: Wetlands, Woods, and Streams.

Wetlands
The wetlands of this co-occurrence are wooded wetland community with species of Cottonwood, Black Willow, Silky Dogwood, Red Osier Dogwood, Sensitive Fern and Cattail species. The adjacent wetland depressions to the creek function as vernal pool and flood storage areas.

Woods
The woods of this co-occurrence are young, mostly made up of Willow species, Cottonwood and Box Elder.



Wooded wetland with thick understory along stream banks

Slopes
There are only minor steep slopes within this co-occurrence, mostly gradual slopes from adjacent upland areas.

Streams
The Class C stream within this co-occurrence has a good vegetated corridor protecting it from farming activities. The stream contains a large number of minnows.

Floodplain
The majority of floodplain of this stream is located in the wetland.

Rating

Resource	**Ranking**
Wetlands	4
Woods	1
Streams	3
Floodplain	1
Total	**9**

FC-2-NS

Location: FC-2 is located ±1,200 feet south of Boughton Hill Road (County Road 41).

This co-occurrence is approximately 16 acres in size and contains 4 resources: Wetlands, Streams, Floodplain, and Woods.

Wetlands
The wetlands of this co-occurrence are wooded wetlands with shrubs.
Woods
There is a mix of shrubs and mature woods along the tributary.

Streams
The stream is a Class C(T).

Floodplain
The floodplain is located within the wetlands.

FC-3-FS

Location: FC-3 is located ±2,000 feet east of NYS Route 444, ±1,500 feet west of Brace Road, and north of Cherry Street.

This co-occurrence is approximately 10 acres in size and contains 5 resources: Wetlands, Woods, Slopes, Streams, and Floodplain.



Mix of mature and young trees on steep slopes



Emergent Marsh and wooded corridor

Wetlands
The wetlands of this co-occurrence are emergent marsh and wetland meadow. There are a variety of wetland plant species including Jewelweed, Joe Pye Weed, Spice Bush, Boneset, Sensitive Fern, and Green Ash, Red Maple, Silver Maple, etc.

Woods
The woods of this co-occurrence are a mix of mature and young trees, mostly Maple species.

Slopes
The steep slopes of this co-occurrence are over 20% and are covered with a variety of tree species.

Streams
The stream of this co-occurrence is a Class C intermittent stream.

Floodplain
The floodplain of the stream is located within the wetlands.

Rating

Resource	**Ranking**
Wetlands	4
Woods	3
Slopes	2
Streams	3
Floodplain	1
Total	**13**

FC-4-FS

Location: FC-4 is located between Boughton Hill Road and Break of Day Road.

This co-occurrence is approximately 22 acres in size and contains 5 resources: Wetlands, Woods, Streams, Floodplain, and Slopes.

Wetlands
The wetlands of this co-occurrence are adjacent to the stream bed and generally within the creek banks.



Emergent wetland floodplain along streambed

Woods
The woods are mature and stabilize the steep banks above the creek's floodplain. Maple species, Red Oak, American Basswood, Hickory species, Cottonwood, and White and Green Ash were observed.

Slopes
The steep slopes are located above the creek at 15% with some areas over 30%.

Streams
The Class C stream is fast flowing with some pools 2"-18" deep, and the stream has a gravelly, rocky substrate. Crayfish and fish (minnows) were observed.

Floodplain
There are wetland floodplain areas with some upland floodplain areas within the golf course.

Rating

Resource	Ranking
Wetlands	2
Woods	4
Slopes	3
Streams	3
Floodplain	1
Total	**13**

FC-5-FS

Location: FC-5 is located on the east side of Brace Road, ±1,500 feet south of Boughton Hill Road.

This co-occurrence is approximately 18 acres in size and contains 4 resources: Wetlands, Streams, Floodplain, and Woods.

Wetlands
The wetland of this co-occurrence is an emergent marsh. It includes a large diversity of wetland plants along with monocultures of Cattail species in some areas. The wetlands stores water runoff from farm fields and provides water quality treatment.



Emergent wetland with a monoculture of Cattail species

Woods
The woods within this co-occurrence are generally small softwoods, including Willow species and Green Ash.

Streams
The Class C stream receives water from the adjacent agriculture farmland.

Floodplain
The floodplain is located in large areas of the wetlands.

Rating

Resource	Ranking
Wetlands	3
Woods	1
Streams	3
Floodplain	1
Total	**8**

FC-6-NS

Location: FC-6 is located west side of Brace Road., ±2,000 feet east of NYS Route 444, ±5,000 feet south of Boughton Hill Road, and north of Cherry Street.

This co-occurrence is approximately 20 acres in size and contains 5 resources: Wetlands, Woods, Slopes, Streams, and Floodplains.

Wetlands

The wetlands are emergent wetlands with pond and forested, wooded areas.

Woods

The wooded areas are located to the south of the co-occurrence.

Slopes

The steep slopes are located within the wooded areas.

Streams

The stream is a Class C.

Floodplain

The floodplain is located within the wetland areas.

FC-7-NS

Location: : FC-7 is located ± 3,000 ft. east of Brace Rd., ± 3,100 ft. south of Boughton Hill Rd.

This co-occurrence is approximately 17 acres in size and contains 5 resources: Wetlands, Woods, Slopes, Streams, and Floodplain.

Wetlands

The wetlands are classified as emergent wetlands and wooded wetlands.

Woods

The wooded areas are located along the stream.

Slopes

The steep slopes are located within the woods adjacent to the wetlands and creek.

Streams
The stream is a Class C(T) and flows through the wetlands.

Floodplain
The floodplain is located in wetland areas.

TOWN OF VICTOR NRI - VOLUME 2
14. WILDLIFE HABITAT INVENTORY

Wildlife Habitat Inventory

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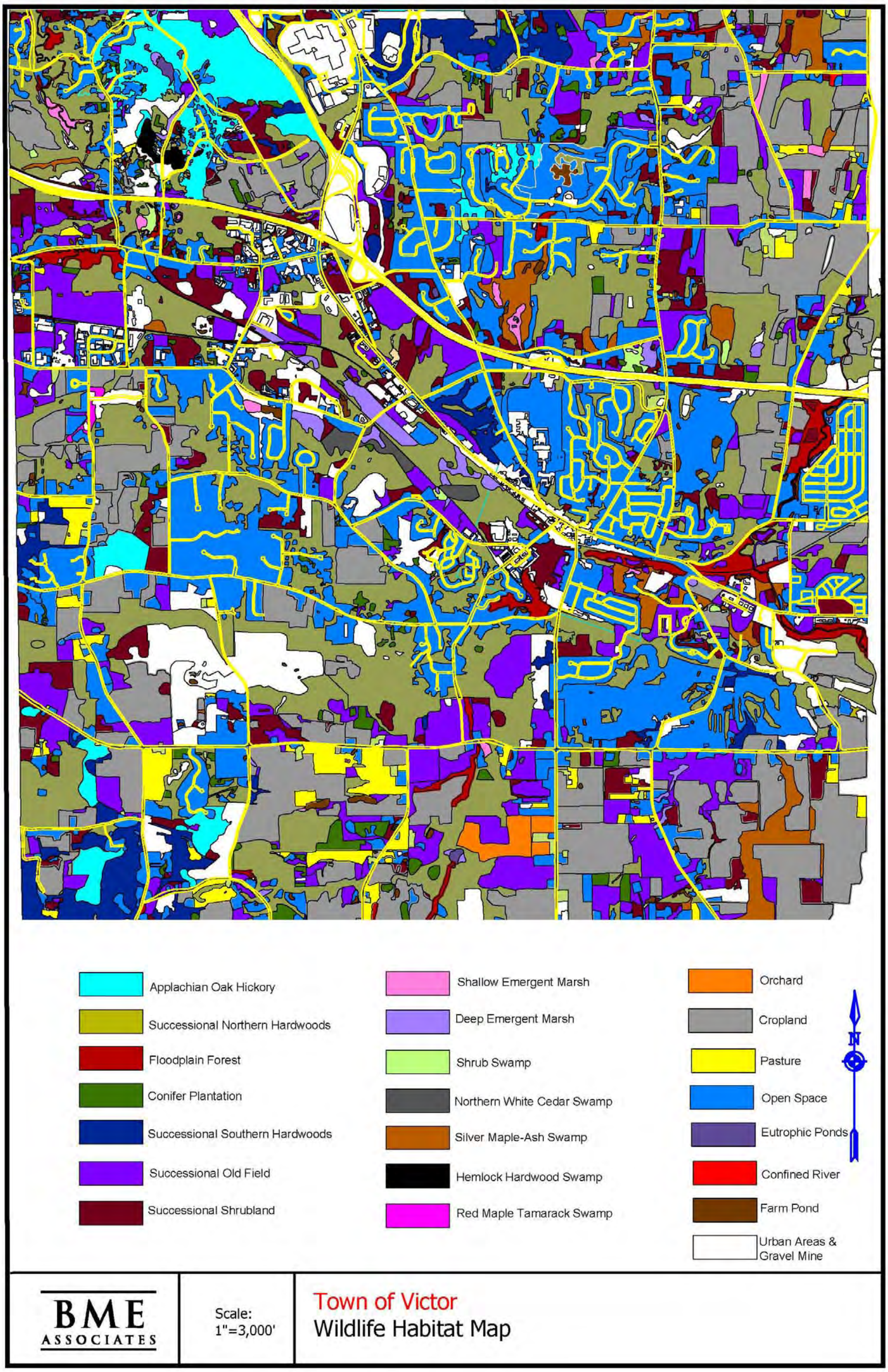
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1. WILDLIFE HABITAT INVENTORY MAP





2. WILDLIFE HABITAT IDENTIFICATION AND DESCRIPTION

The Town of Victor includes approximately 23,094 acres including forest, shrubland, wetlands, farmland, and developed areas. Several major wildlife habitats were identified using information obtained from Ontario County Planning Department, the New York Natural Heritage Program and field observations. The majority of the habitats were observed in the field to verify their composition and approximate boundaries. Representative photos of each habitat were taken and included in the report to assist document users with field habitat identification.

A list of the basic wildlife species for each habitat has also been included in the report. Breeding birds within the Town of Victor were identified from *The New York State Breeding Bird Atlas* and from field observations. *The New York State Herpetological Atlas Project,* as well as other materials, were reviewed to identify known occurrences of amphibian and reptile species within the Town's different habitats. Mammals were listed as evidenced from field observations and other available information.

The significance of each habitat has been determined by the Natural Heritage Program. Each habitat has received a "ranking" or code by their rarity. See below for the explanation for each code:

GLOBAL RANK

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences), or very few remaining acres, or miles of stream) or especially vulnerable to extinction because of some factor of its biology.

G2 = Imperiled globally because of rarity (6 - 20 occurrences, or few remaining acres, or miles of stream) or very vulnerable to extinction throughout its range because of other factors.

G3 = Either rare and local throughout its range (21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range (e.g., a physiographic region), or vulnerable to extinction throughout its range because of other factors.

G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

G5 = Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

STATE RANK
S1 = Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State.

S2 = Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably making it very vulnerable in New York State.

S3 = Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

S4 = Apparently secure in New York State.

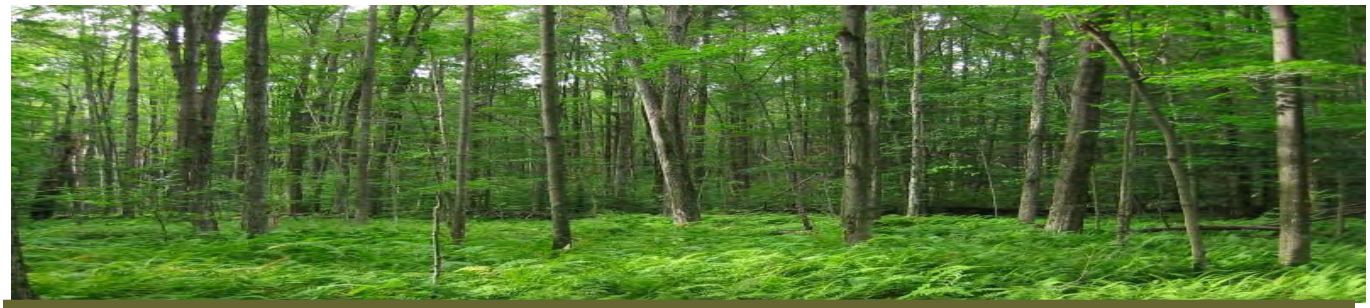
S5 = Demonstrably secure in New York State.

The habitats which are the most rare are: Rich Shrub Fen (G3G4, S1S2), Northern White Cedar Swamp (G3G4, S2S3), Red Maple Tamarack Peat Swamp (G3G4, S2S3), Floodplain Forest (G3G4, S2S3) Silver Maple Ash Swamp (G3G4, S2S3) and Hemlock Hardwood Swamp (G4G4, S4). The other habitats found in the Town of Victor are more common.

The following section is a summary of the existing Town's habitats:

	Approximate Land Area (Ac.)	Approximate % of Town Area	Most Rare Statewide
Temperate Broadleaf Forests			
Appalachian Oak Hickory Forest	726.4	3.1%	
Successional Northern Hardwood (SNH)	4,320.1	18.8%	
Beech- Maple Mesic Forest	Included in SNH	Included in SNH	
Hemlock-Northern Hardwood Forest	Included in SNH	Included in SNH	
Floodplain Forest	273.0	1.2%	**X**
Successional Southern Hardwoods	653.5	2.8%	
SUB-TOTAL:	**5,973.0**	**26.6%**	
Meadowland			
Successional Old Field*	**2,206.7**	**9.3%**	
**Includes Flower/Herb Garden*			
Shrubland			
Successional Shrubland*	**1,293.8**	**5.6%**	
Wetlands			
Shallow Emergent Marsh	75.1	0.3%	
Deep Emergent Marsh	160.3	0.7%	
Shrub Swamp	42.5	0.2%	
Rich Shrub Fen	5.0	0.02%	**X**
Northern White Cedar Swamp	54.9	0.2%	**X**
Silver Maple-Ash Swamp	405.7	1.8%	**X**
Hemlock Hardwood Swamp	27.2	0.1%	**X**
Red Maple Tamarack Peat Swamp	12.3	0.05%	**X**
SUB-TOTAL:	**783.0**	**3.3%**	
Farmland			
Orchard	76.2	0.3%	
Cropland	3,338.7	14.5%	
Pasture	387.7	1.7%	
Conifer Plantation	313.9	1.4%	
SUB-TOTAL:	**4,116.5**	**17.9 %**	
Open Water			
Eutrophic Pond (Kettle Lakes)	37.9	0.1%	
Confined River	34.9	0.2%	
Farm/Artificial Ponds	114.2	0.5%	
SUB-TOTAL:	**187.0**	**0.8%**	
Residential, Recreational Areas	6,040.0	26.4%	
TOTAL:	**20,600.0**	**89.2%**	
Unclassified/Urban Areas	**2,494**	**10.8%**	
GRAND TOTAL:	**23,094.0**	**100%**	

The following habitat descriptions are consistent with *"Ecological Communities of New York State"* by the New York Natural Heritage Program. Representative wildlife species and location descriptions within the Town of Victor are based on field observations, information from New York State Natural Heritage and assessment of the Ecological Communities map provided by Ontario County. The importance, threats, viability and management for each wildlife habitat is also discussed in applicable sections.



2.1 TEMPERATE BROADLEAF FORESTS

Area: This group represents 5,973 acres (26.6%) of Town lands. These forest wildlife habitats include; Appalachian Oak Hickory Forest, Successional Northern Hardwoods, Beech-Maple Mesic Forests, Hemlock-Northern Hardwood Forest, Floodplain Forest, and Successional Southern Hardwoods.

Importance: Many areas of this habitat are surrounded by farmland, roads and development, and therefore this habitat creates valuable corridors for wildlife. They also act as a good "buffer" for wildlife from development and human interactions.

Interior wildlife species (mostly bird species) can be found in some of these habitats which have a larger continuous forested habitat (such as the Appalachian Oak Hickory Forest in the northwestern corner of the town). These species will only nest or live in larger mature forested areas with a dense canopy.

Threats: Threats to forests include changes in land use requiring clearing of the land, forest fragmentation (farming, building roads, development, etc.), and the spread of invasive species (plants, insects, diseases, etc.). One of other threats is overpopulation of the white-tailed deer. A century ago, white-tailed deer were more rare in this area. Over the years, the population has been growing due to a lack of natural predators and limiting hunting regulations. The overpopulated white-tailed deer can create a number of problems. These can include traffic safety, farm crop losses and garden/landscaping damages, as well as implications for bio-diversity and survival of forests.

A large density of deer in an area can reduce the forest understory to a point that it affects the bio-diversity of the vegetation by reducing the number of tree species within it. Additionally, mature trees may not be replaced if there are no younger trees within a forest due to over foraging.

Another negative effect deer have on the biodiversity of habitats is the allowance for invasive species to expand. Many invasive species including buckthorn, honeysuckle, autumn olive, etc., are not on the white-tails menu and therefore these invasive species can flourish. The invasives outcompete the native species which are an important source of food for other wildlife including insects, birds, and small mammals.

Viability:. The viability of these habitats is associated with succession in general. For example, younger Northern Successional Hardwoods are maturing over the years and can become a more mature forest such as an Oak Hickory habitat. This process is affected by the competition for sunlight. The trees which are shade tolerant (Sugar and Red Maple, Hemlock, Oaks, Hickories, Basswood, American Beech) will become more abundant as the trees grow larger, shading more of the understory. The trees which are shade intolerant (Birch species, Aspen species, Cherry species, Pine species, etc.) can ultimately decrease in numbers. The length of time for one habitat to successionally grow into another can take many years.

Management: The long-term viability of this habitat can be improved by implementing appropriate forest management practices. The NYS Department of Environmental Conservation and the Ontario County Soil & Water Conservation District offer landowners consultation on various management programs. These programs focus on activity that help maintain or regenerate a desired species. Thinning dense forests and removing undesired species can greatly improve viability of these wooded areas. Proper forest management practices will help to improve quality and longevity of the forest. Focus should also be on minimizing fragmentation and loss of the habitat. Providing a well designed cluster developments and proper placement of road corridors in environmentally less valuable areas can help reduce the habitat fragmentation.

The white-tailed deer of this region need to be managed due to the lack of predators. Hunting is a good way to keep deer populations down and to keep forested areas more healthy. The New York State relies on hunters to manage the deer population. Just recently the hunting season was extended to allow for further reduction of the expanding deer population. The biodiversity of plant communities can be reduced by deer in areas where hunting is prohibited, such as parks and preservations.

2.1.A Appalachian Oak Hickory Forest

Location: These forests are mainly located in the northwest corner of the Town, north of the Thruway and west of State Route 490.

Size: There are approximately 726 acres (3.1%) acres of Appalachian Oak Hickory within the Town of Victor.

Co-occurrence Areas: These forests can be found in areas of IC-2, IC-7 and IC-8

Description: Appalachian Oak Hickory forests typically occur on well-drained sites, ridgetops, upper slopes, or south- and west-facing slopes. The soils are mostly loams or sandy loams. The Appalachian Oak Hickory Forest is a broadly defined forest community with several variants. The dominant trees include one or more species of oaks (red, white, black, etc.) and hickories (pignut, shagbark, sweet pignut, etc.) with maple-leaf viburnum commonly found in the understory.



The Appalachian Oak Hickory Forest in the Town of Victor would be considered woods with the majority of the trees being mature in good or fair quality.

Early spring is a good time to identify many of the trees and understory shrubs in bloom like dogwood species, cherry species, maple-leaf viburnum and witch hazel.

Characteristic Species

Trees > 5m (Height in meters (m))

- Black Oak
- Chestnut Oak
- Hophornbeam
- Pignut Hickory
- Red Oak
- Red Maple
- Shagbark Hickory
- Sugar Maple
- White Ash
- White Oak

Shrubs 2-5m

- American Witch-hazel
- Dogwood Species

Herbs

- Golden Rod Species
- Jumpseed
- May Apple
- Wood Strawberry

Representative Wildlife Species

Mammals

- Chipmunk
- Coyote
- Raccoon
- Red and Gray Fox
- Squirrel (Red and Gray)
- White-Tailed Deer

Birds

- American Crow
- American Woodcock
- Barred Owl
- Common Grackle
- Eastern Wood Pee Wee
- Great Horned Owl
- Pileated Woodpecker
- Red Tailed Hawk
- Screech Owl
- Wild Turkey
- Wood Thrush
- Woodpecker Species

2.1.B Successional Northern Hardwoods

Location: These hardwoods are located throughout the town.

Size: There are approximately 4,320 acres (18.8%) of Succesional Northern Hardwoods within the Town of Victor. This habitat makes up approximately 72% of the Temperate Broadleaf Forest which makes it the largest forest habitat in the Town.

Co-occurrence Areas: These hardwoods can be found in areas of co-occurrences SB-1 and GB-4.



Description: Successional Northern Hardwoods typically occur on sites that have been cleared in the past or otherwise disturbed. This is a broadly defined community type with a great deal of variation. The soils of successional northern hardwood forests are usually loamy, cool and moist. They can be found at lower elevations on gentle to steep slopes. The canopy of trees are generally small. They are less than 40 feet tall and up to 30 years of age. Most of the herb species within the forest are perennial long lived species, which usually flower and fruit in the early spring before the canopy leafs out.

Beech, Yellow Birch and Maples are commonly found within these forests. Because of the great variation within these forests, other trees such as Black Cherry, Balsam Poplar and Quaking Aspen can also be found as well.

Characteristic Species

Trees > 5m

- American Elm
- Balsam Poplar
- Bigtooth Aspen
- Black Cherry
- Gray Birch
- Green Ash
- Hickory Species
- Oak Species
- Paper Birch
- Quaking Aspen
- Red Maple
- Sugar Maple
- White Ash
- Yellow Birch

Representative Wildlife Species

Mammals

- Chipmunk
- Coyote
- Raccoon
- Red and Silver Fox
- Skunk
- Squirrel (Red and Gray)
- White-Tailed Deer

Birds

- American Crow
- American Woodcock
- Common Grackle
- Downy Woodpecker
- Eastern Wood Peewee
- Great Horned Owl
- Hairy Woodpecker
- Red-Bellied Woodpecker
- Wild Turkey

2.1.C Beech-Maple Mesic Forests

Location: These forests are located within the Successional Northern Hardwood forests in small fragmented patches throughout the Town.

Size: The area of these forests is included in the overall Successional Northern Hardwoods Forests totals.

Co-occurrence Areas: These forests can be found in areas of IC-1 and IC-8.



Description: Beech-maple mesic forest are closed-canopy hardwood forests with codominating sugar maple and American beech. This is, again, a broadly defined community type. These forests occur on moist, but well drained, usually acid soils. There are many plants understory species that bloom before the canopy trees leaf out. Hemlock may be present at a low density.

The codominance of American beech and sugar maple with a variety of herbaceous species is common. Sugar maple and birch saplings are often the most abundant small trees in the understory, along with shrubs such as American witch-hazel and various viburnum species.

Characteristic Species

Trees > 5m

- American Beech
- Eastern Hemlock
- Red Maple
- Red Oak
- Red Spruce
- Sugar Maple
- Sweet Birch
- White Ash
- Wild Black Cherry
- Yellow Birch

Shrubs 2-5m

- American Witch-hazel
- Mapleleaf Viburnum
- Striped Maple
- Viburnum Species

Herbs

- Canada May-flower
- Fern Species
- Trillium Species

Representative Wildlife Species

Mammals

- Chipmunk
- Coyote
- Mice/Moles/Voeles
- Opossum
- Raccoon
- Red and Gray Fox
- Skunk
- Squirrel (red and gray)
- White-Tailed Deer

Birds

- American Crow
- Common Grackle
- Dark Eyed Junco
- Downy Woodpecker
- Eastern Wood Peewee
- Great Horned Owl
- Hairy Woodpecker
- Red-Bellied Woodpecker
- Wild Turkey

2.1.D Hemlock-Northern Hardwood Forest

Location: These forests can be found in the northwestern corner of the Town as a part of the Northern Successional Hardwood Forests. The best place to see these forests are along Lower Fishers Road and off of Log Cabin Road on the border of the areas of Hemlock Swamp and Rich Shrub Fen.

Size: The area of the Hemlock-Northern Hardwood Forests of Victor was also included in the Successional Northern Hardwood Forests total.

Co-occurrence Areas: These forests can be found in areas of IC-2.

Description: The Hemlock-Northern Hardwood Forest is a mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is codominant tree species with one to three of the following tree species: American beech, sugar maple, red maple, black cherry, white pine, yellow birch, black birch, red oak, and basswood. The relative cover of eastern hemlock is quite variable, ranging from nearly pure stands in some steep ravines to as little as 20% of the canopy cover. Striped maple is often prominent as a mid-story tree.



The Town of Victor does not have many Hemlock-Northern Hardwood Forests and the current trend of this community throughout New York is declining due to moderate and imminent threats related to Hemlock woolly adelgid, an insect which can be destructive to Hemlock by sucking the sap from the trees.

The sheltered coves within hemlock-northern hardwood forests offer escape for wildlife from the leafless deciduous forests in the winter. Throughout the winter, birds can be found foraging in bark crevices and among the green needles of hemlock trees.

Characteristic Species

Trees > 5m

- American Beech
- Black Birch
- Chestnut Oak
- Eastern Hemlock
- Eastern White Pine
- Red Maple
- Red Oak
- Sugar Maple
- White Oak

Shrubs 2-5m

- Laurel Species

Shrubs <2-m

- Viburnum Species

Herbs

- Canada May-flower
- Fern Species

Representative Wildlife Species

Mammals

- Chipmunk
- Coyote
- Rabbit
- Raccoon
- Skunk
- Squirrel (red and gray)
- White-Tailed Deer

Birds

- American Crow
- American Woodcock
- Common Grackle
- Downy Woodpecker
- Eastern Wood Peewee
- Great Horned Owl
- Hairy Woodpecker
- Red-Bellied Woodpecker

2.1.E Floodplain Forest

Location: These floodplain forests of the Town of Victor can be found in different areas that generally surround Irondequoit and Ganargua Creek.

Size: There are approximately 273 acres (1.2%) of floodplain forests within the Town of Victor.

Co-occurrence Areas: These floodplain forests can be found in areas of IC-1, GB-2, SB-1 and IC-4.

Description: Floodplain forests typically occur on mineral soils on low terraces of creek and river floodplains. These sites are characterized by their flood regime; low areas are annually flooded in spring, and high areas are flooded irregularly. Some sites may be dry by late summer, whereas other sites may be flooded again in late summer or early autumn.



Floodplain Forest have many good qualities, functions and values they bring to an ecological community. Floodplains can have great biodiversity and create rich wetland communities. (See the Floodplain Section within the Phase 1 Natural Resource Inventory Report

Characteristic Species

Trees > 5m

- American Elm
- Black Willow
- Box Elder
- Cottonwood
- Green Ash
- Hickory Species
- Quacking Aspen
- Red Oak
- Red Maple
- River Birch
- Silver Maple
- White Ash
- White Oak

Shrubs 2-5m

- Gray Dogwood
- Ironwood
- Red Osier Dogwood
- Silky Dogwood
- Speckled Alder
- Spicebush

Shrubs <2-m

- Honeysuckle Species
- Meadowsweet
- Multiflora Rose

Herbs

- False Nettle
- Garlic Mustard
- Goldenrod Species
- Jewelweed
- Jumpseed
- Nightshade Species
- Sedges
- Sensitive Fern
- Skunk Cabbage
- Wood Nettle

Vines

- Poison Ivy
- River Bank Grape
- Virginia Creeper
- Willow Species

Representative Wildlife Species

Mammals

- Chipmunk
- Raccoon
- Skunk
- Squirrel (red and gray)
- White-Tailed Deer

Amphibians

- American Toad
- Green Frog
- Spring Peeper
- Western Chorus Frog
- Wood Frog

Birds

- American Crow
- American Woodcock
- Downy Woodpecker
- Eastern Wood Peewee
- Great Blue Heron
- Great Horned Owl
- Least Flycatchuk
- Sparrow Species
- Warbling Vireo
- Wild Turkey
- Wood Duck

2.1.F Successional Southern Hardwoods

Location: These successional southern hardwoods are located mostly in the northern portion and also in the southwest corner of the Town.

Size: There are approximately 653 acres (2.8%) of Successional Southern Hardwoods within the Town of Victor.

Co-occurrence Areas: These southern hardwoods can be found in areas of FC-4.

Description: Successional Southern Hardwood forest typically occur on sites that have been cleared or otherwise disturbed. This is a broadly defined community dominated by light requiring species that are well-adapted to quick establishment following disturbance.



A characteristic feature of successional forests is the lack of reproduction of the canopy species. Most of the tree seedlings and saplings in the successional forest are species that are more shade tolerant than the canopy species. Shrublayer and groundlayer dominants may include many species characteristic of successional old fields, or they may include species that occurred on or near the site prior to disturbance.

Characteristic Species

Trees > 5m

- American Elm
- Black Locust
- Gray Birch
- Hawthorn
- Red Maple
- Sassafras
- Silver Maple
- White Ash

Shrubs 2-5m

- Buckthorn
- Choke Cherry

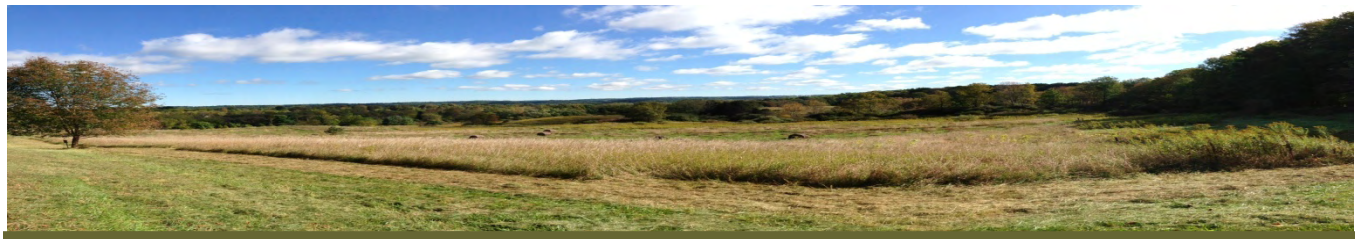
Representative Wildlife Species

Mammals

- Chipmunk
- Coyote
- Mice/Moles/Voles
- Opossum
- Raccoon
- Red and Gray Fox
- Skunk
- Squirrel (red and gray)
- White-Tailed Deer

Birds

- American Crow
- American Woodcock
- Chestnut-Sided Warbler
- Common Grackle
- Downy Woodpecker
- Eastern Wood Peewee
- Great Horned Owl
- Hairy Woodpecker
- Red-Bellied Woodpecker
- Wild Turkey



2.2 MEADOWLAND

Area: The meadowland habitats within the Town of Victor include Successional Old Fields. This single habitat type covers approximately 2,207 acres (9.3%) of the Town's lands.

Importance: Meadowlands in New York are on the decline. There are species of birds which need this type of habitat for nesting, breeding and as a food source.

Threats: This habitat is very valuable and is quickly disappearing. The conservation of grassland birds in New York is a high priority. Grassland birds which breed in New York include: Northern Harrier, Upland Sandpiper, Sedge Wren, Henslowe's Sparrow, Bobolink, Horned Lark, Vesper Sparrow, Eastern Meadow Lark, and the Savannah Sparrow. The Northern Harrier and Horned Lark overwinter in New York as occasionally does the Eastern Meadow Lark.

Viability: The long-term viability of this habitat depends on its management. The successional meadows (old fields) will eventually get outcompeted by shrubs and trees. If these habitats are not mowed, brush hogged or grazed, they will eventually become brushland and forest over time.

Management: Small areas of Successional Old Fields (<5 acres) can be important to a variety of wildlife, but some shrubland/grassland birds are *"area sensitive"* as they prefer and select larger areas of contiguous habitat for breeding.

Proper management of Successional Old Fields includes periodic brush hogging of the meadow areas to keep shrubs and trees under control, and to maintain herbaceous cover. There are several programs offered by the US Department of Agriculture, which provide financial incentives to the landowners for maintaining viability of the meadows by

cutting them usually once in three years and applying other management techniques as necessary. The New York State Department of Environmental Conservation administers The Landowner Incentive Program for Grassland Protection and Management Program which encourages private landowner to take participation in habitat management and protection. This program provides technical advice and financial incentives for the protection of at-risk wildlife and habitats, specifically grassland birds and their habitat. Audubon New York has a Management for Farmland (Grassland) Bird fact sheet which has more information on Grassland birds and describes how to manage farmland for these species. Cornell University Cooperative Extension also has information on Transforming Fields into Grassland Habitat for private landowners.

2.2.A Successional Old Field and Abandoned Farmland

Location: These successional old fields are located throughout the Town.

Size: Successional old fields total approximately 2,207 acres (9.3%) within the Town of Victor. This habitat is the third largest in the town after Successional Northern Hardwoods, and Cropland.

Co-occurrence Areas: These fields can be found in areas of FC-5 and FC-1.

Description: Successional Old Fields are dominated by forbs, grasses and shrubs that occur on sites that have been previously cleared and plowed (usually for farming), and then abandoned for over 3 years.



Successional (Abandoned) Farmlands are dominated only by forbs and grasses and are the early stages of succession from an abandoned farmland (1-3 years).

This habitat is important for many mammal, bird and insect species. It provides food and nesting opportunities. For example, this habitat is the most important food source for insects (pollinators, etc.) by providing nectar and pollen. A good population of insects is important for birds as it provides a viable food source.

Characteristic Species

Herbs

- Bluegrass
- Common Chickweed
- Common Dandelion
- Goldenrod Species
- Hawkweed
- New England Aster
- Orchard Grass
- Queen Ann's Lace

Shrubs

- Arrowwood
- Autumn Olive
- Gray Dogwood
- Honey Suckle Species
- Ragweed
- Raspberry Species
- Silky Dogwood
- Sumac Species

Representative Wildlife Species

Mammals

- Chipmunk
- Mice/Moles/Voles
- Rabbit
- Red Gray Fox
- Squirrel (red and gray)
- White-Tailed Deer
- Woodchuck

Reptiles

- Common Garter Snake
- Eastern Milk Snake

Birds

- American Robin
- Eastern Blue Bird
- Field Sparrow
- Song Sparrow
- Wild Turkey



2.3 SHRUBLAND

Area: The shrubland habitats within the Town of Victor cover approximately 1,294 acres (5.6%) of the Towns Lands.

Importance: Impenetrable and dense, shrublands are often ignored and undervalued by people. For some species of wildlife, such as rabbits, American woodcock, and many songbirds, shrublands provide the best possible cover. The shrubs and young trees growing in these areas also supply an abundance of berries and fruit, eaten by many different birds and mammals.

Threats: Threats to this habitat include changes in land use requiring clearing of the land for development or farming, succession, and the spread of invasive species.

Viability: Shrubland habitats are almost always temporary**,** existing on the land for a relatively short period of time. If an open field is left alone, unmowed, for just a few years, shrubs and trees will start to grow. As the trees grow taller, they shade out grasses, wildflowers and shrubs. Within twenty to thirty years, the area that was once a shrubland will become a young forest.

Management: In today's landscape, small areas of shrublands may be created naturally. However, most wildlife biologists agree that to sustain wildlife species that depend on shrublands, additional management to create shrubland habitat is needed. The problem isthat maintaining large areas of existing shrubland may cost money and provide little economic return to landowners.

2.3.A Successional Shrubland

Location: These shrublands are located throughout the Town of Victor.

Size: There are approximately 1,294 acres (5.6%) of Successional Shrublands within the Town of Victor.

Co-occurrence Areas: These successional shrublands can be found in areas of IC-9 and WB-7.

Description: Successional Shrublands occur on sites that have been cleared for farming, by logging, or disturbed otherwise.



The shrublands provide important cover, food and nesting opportunities for wildlife. For example, many of the shrubs provide berries which are great food for birds and some mammals in the fall and winter. These areas, especially when combined with meadow openings, are very important for wildlife, including mammals, birds, and insects. There are many areas overtaken by more aggressive invasive shrubs such as buckthorn, autumn olive, rosa multiflora, and honeysuckle species. Even though these shrubs have negative effect on population of native shrubs, they still have value as they provide shelter, pollen and nectar for insects, and berries for birds and some mammals. Native species though are important food source and for reproduction cycle of many native insects, while invasive species do not provide that as much.**Characteristic Species**

Shrubs > 5m

- Arrowwood
- Autumn Olive
- Choke-Cherry
- Graywood Dogwood
- Hawthorne Species
- Honeysuckle Species
- Multiflora Rose
- Nanny-Berry
- Raspberry and Blackberry Species
- Sumac Species

Representative Wildlife Species

Mammals

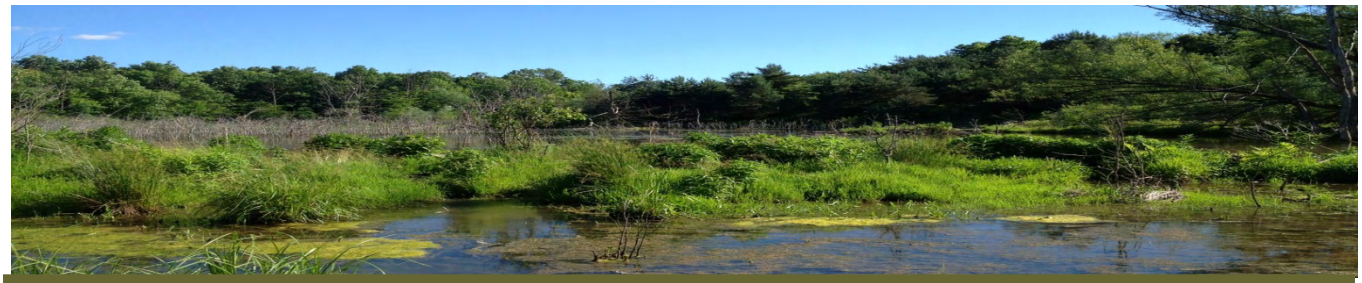
- Coyote
- Mice/Moles/Voles
- Rabbit
- Skunk
- White-Tailed Deer

Reptiles

- Common Garter Snake
- Eastern Milk Snake

Birds

- American Gold Finch
- Blue-Winged Warbler
- Brown Thrasher
- Chestnut-Sided Warbler
- Eastern Towhee
- Field Sparrow
- Golden-Winged Warbler
- Song Sparrow
- Yellow-Breasted Nut Hatch



2.4 WETLANDS

Area: The wetlands represent 729 acres (3.4%) of the Town lands. This group of wetland habitats includes Shallow Emergent Marsh, Shrub Swamp, Rich Shrub Fen, Northern White Cedar Swamp, Silver Maple-ash Swamp, Hemlock Hardwood Swamp, and Red Maple Tamarack Peat Swamp.

Importance: The wetlands within the Town of Victor provide good habitat for many wildlife species. The variety of wetland plants (trees, shrubs, grasses, forbs, ferns, sedges and rushes) and open water within the wetlands provide a source of food, shelter, breeding areas and nesting opportunities for many species. Some wildlife species common to a wetland habitat include: Waterfowl (ducks, geese, etc.), amphibians (frogs, salamanders and newts), and reptiles (turtles, etc.). Wetland habitats include forest areas covered with shrubs and wetland meadows or marshes.

Threats: It is important to consider the potential effect of drainage when it is artificially redirected from wetlands to a different area. This can happen when new stormwater drainage systems are installed through farming or development of land. Untreated runoff from farmland or developed areas can negatively affect the diversity of wetland plants, which can lead to habitat alteration. Also, caution should be taken when working near or within wetlands to not introduce any wetland invasive species such as phragmites, purple loosestrife, etc as these are another threat to the wetland of the Town of Victor. This can be seen within the State Route 96 corridor within the Town and Village of Victor.

Viability: Long-term viability of wetlands is dependent on maintaining the quantity and quality of it's water source. The majority of the wetlands are protected by federal and state regulations. Disturbances to regulated wetlands have to be permitted by the US Army Corps of Engineers and in some cases also by the NYS Department of Environmental Conservation. Any disturbances proposed to the regulated wetlands need to be justified and proved unavoidable before these agencies can issue a wetland disturbance permit. The wetland regulations help to support the viability of the wetland areas.

The current NYSDEC Stormwater Management Guidelines for developments address water quality treatment prior to discharges to streams or wetlands. Polluted water is treated first in stormwater management areas before it is discharged. The existing wetland buffers should be preserved where possible as they filter stormwater pollutants and capture sediments before they enter wetland areas.

2.4.A Shallow Emergent Marsh

Location: These marshes are located in the center of the Town, south of Route 96 and north of the Thruway in the eastern portion of the Town.

Size: There are approximately 75 acres (0.3%) of shallow emergent marsh within the Town of Victor.

Co-occurrence Areas: These marshes can be found in areas of WB-1, IC-3, IC-12, IC-1 and GB-4.

Description: Shallow emergent marshes occur on mineral soil or muck soils that are permanently saturated and seasonally flooded. These types of marshes drain well; water depths may range from 6 inches to 3.3 feet (15 cm to 1 m) during flood stages, but the water level usually drops by mid to late summer and the substrate is exposed. Typically, these marshes occur along streams. Deep and shallow emergent marshes may occur together.



The shallow emergent marshes have a very diverse assemblage of herbaceous plants. These plants include: grasses, cattails, wetland ferns and a variety of forbs. There are also a number of different types of sedges and rushes.

Characteristic Species

Trees > 5m

- Red Maple (sporadic)

Floating-leaved aquatics

- Common Frogbit

Herbs

- Arrow-leaf Tearthumb
- Bluegrass Species
- Blue-joint Reedgrass
- Canada Manna-grass
- Cattail Species
- Common Rush
- Cottongrass Bulrush
- False Nettle
- Giant Goldenrod
- Marsh Fern
- Reed Canary Grass
- Rice Cutgrass
- Sensitive Fern
- Spotted Jewelweed
- Tussock Sedge
- Woolgrass Bulrush

Representative Wildlife Species

Mammals

- Beaver
- Muskrat

Amphibians

- Eastern American Toad
- Green Frog
- Northern Leopard Frog

Birds

- American Woodcock
- Common Yellow Throat
- Great Blue Heron
- Green Heron
- Red Winged Black Bird
- Song Sparrow
- Swamp Sparrow
- Yellow Bellied Flycatcher

2.4.B Deep Emergent Marsh



Photo Credit: New York Natural Heritage Program

Location: These marshes are located throughout the Town of Victor.

Size: There are approximately 160 acres (0.7%) of deep emergent marsh within the Town of Victor.

Co-occurrence Areas: These marshes can be found in areas of SB-1 and FC-5.

Description: Deep Emergent Marshes typically occur on mineral soils or fine-grained organic soils; the substrate is flooded. Water depths can range from 6 inches to 6.6 feet (15 cm to 2 m) water levels may fluctuate seasonally, but the substrate is rarely dry. Deep emergent marshes can be quite variable. They may be codominated by a mixture of species or have a single dominant species.

In a deep emergent marsh, the water remains within the wetland year-round. The vegetation within this habitat consists of non-woody plants growing out of this water. Many of deep emergent marshes in the area are dominated by cattail species.

Characteristic Species

Emergent Aquatics

- Broad-leaf Arrowhead
- Broad-leaf Cattail
- Eastern Wild Rice
- Green Arrow-arum
- Large Bur-reed
- Pickerelweed
- Water Horsetail
  Water Plantain

Aquatics

- American White Waterlily
- Common Hornwort
- Floating Pondweed
- Lesser Duckweed
- Water Lobelia

Representative Wildlife Species

Mammals

- Beaver
- Muskrat

Amphibians

- Bull Frog
- Eastern American Toad
- Green Frog
- Northern Leopard Frog
- Painted Turtle
- Snapping Turtle
- Western Chorus Frog

Birds

- American Woodcock
- Blue Heron
- Canada Goose
- Common Yellow Throat
- Eastern Phoebe
- Marsh Wren
- Red Winged Black Bird
- Swamp Sparrow
- Waterfowl Species

2.4.C Shrub Swamp

Location: These swamps are located throughout the Town of Victor.

Size: There are approximately 42.5 acres (0.2%) of Shrub Swamps in the Town of Victor.

Co-occurrence Areas: These swamps can be found in areas of IC-3, GC-2, WB-2.

Description: Shrub Swamps are wetlands dominated by shrubs that usually occur along the shore of a stream; in a wet depression; or as a transition zone between a marsh or fen, and upland community. The substrate is usually mineral soil or muck.



Many shrub swamps can be dominated by alder, red osier dogwood, silky dogwood buttonbush or willow species, highbush blueberry, spicebush, arrowwood, meadowsweet, and pepperbush.

Shrub swamps are very common and quite variable. They may be codominated by a mixture of species or be a near-monoculture of a single dominant shrub species.

The best time to view the diversity of plants in a shrub swamp is in the summer, from June to August. Many dogwood species begin to bloom as early as May, but most other characteristic shrubs, including meadowsweet, buttonbush and pepperbush bloom from June or July through August.

Characteristic Species

Trees > 5m

- Alder Species
- Willow Species

Shrubs >5

- Alder Species
- Common Buttonbush
- Northern Meadowsweet
- Pepperbush
- Red Osier Dogwood

Shrubs 2-5m

- Arrowwood
- Highbush Blueberry
- Spicebush

Vines

- Riverbank Grape

Herbs

- Cattail Species
- Cinnamon Fern
- Nodding Beggar-ticks
- Reed Canary Grass
- Sedge Species
- Water Smartweed

Floating-leaved Aquatics

- Duckweed Species

Representative Wildlife Species

Mammals

- Beaver
- Muskrat

Amphibians

- Bullfrog
- Green Frog
- Jefferson Salamander
- Northern Leopard Frog
- Northern Red Back Salamander
- Red Spotted Newt
  Spotted Salamander

Birds

- American Tree Sparrow
- Common Yellow Throat
- Great Blue Heron
- Marsh Wren
- Red Winged Blackbird
- Song Sparrow
- Swamp Sparrow

Waterfowl Species

2.4.D Rich Shrub Fen

Location: The fen area is located on both sides Log Cabin Road north of the Lower Fishers Road intersection, north of the Thruway.



Size: The Rich Shrub Fen has small fragmented parts within the Hemlock Hardwood Swamp and totals approximately 5 acres (0.02%).

Co-occurrence Areas: These fens can be found in areas of IC-2.

Description: The Rich Shrub Fen is the most sensitive and rare of all the habitats in Victor. It is protected by The Nature Conservancy.

The Rich Shrub Fen is a peatland in which the substrate is a woody peat, which may or may not be underlain by marl or limestone bedrock. Rich fens are fed by waters that have high concentrations of minerals and high pH values, generally from 6.0 to 7.

The dominant species within these fens are shrubs, which form a canopy and overtop most herbs. Some rich shrub fens are dominated by low shrubs (under 4 ft or 1.2 m) that collectively have 80 to 90% cover in the community. Other rich shrub fens are dominated by taller shrubs (over 4 ft or 1.2 m) that collectively have 50 to 70% cover in the community with low shrubs and graminoids dominant in openings.

These fens receive their water from groundwater, not from adjacent streams or ponds. Characteristic shrubs and small trees include red maple, red osier dogwood, alder, chokeberry, alder-leaf buckthorn, and poison sumac.

Characteristic Species

Trees > 5m

- Red Maple

Shrubs 2-5m

- Green Ash
- Poison Sumac
- Speckled Alder

Shrubs <2m

- Alderleaf Buckthorn
- Common Winterberry
- Red Osier Dogwood
- Shrubby Cinquefoil
- Silky Dogwood
- Southern Arrowwood
- Speckled Alder
- Swamp Fly-honeysuckle
- Tamarack
- Willow Species

Herbs

- Blueflag
- Blue-joint Reedgrass
- Inland Sedge
- Marsh Fern
- Royal Fern
- Skunk Cabbage
- Yellow Sedge

Representative Wildlife Species

Mammals

- Racoon
- Skunk

Amphibians

- Eastern American Toad
- Green Frog
- Jefferson Salamander
- Northern Red Back Salamander
- Northern Spring Peeper
- Painted Turtle
- Red Spotted Newt
- Snapping Turtle
- Spotted Salamander
- Western Chorus Frog

Birds

- American Woodcock
- Common Grackle
- Downy Woodpecker
- Great Blue Heron
- Marsh Wren
- Red Winged Blackbird
- Swamp Sparrow
- Waterfowl Species

2.4.E Northern White Cedar Swamp

Location: These swamps are located adjacent to State Route 251 along the Auburn Creek trail.

Size: There are approximately 54.9 acres (0.2%) of Northern White Cedar Swamp habitat within the Town of Victor.

Co-occurrence Areas: These swamps can be found in areas of IC-11.



Description: Northern White Cedar Swamps occur on organic soils in cool, poorly drained depressions and streams and along streams.

These swamps are often spring fed or enriched by seepage of cold, minerotrophic groundwater, resulting in a stable water table and continually saturated soils. The characteristic tree is northern white cedar, which makes up more than 30% of the canopy cover; characteristic short shrubs include dwarf raspberry and red osier dogwood. Hemlock, balsam fir, and red maple are also often found in a northern white cedar swamp. The community also contains a number of herbaceous species that bloom in the spring, as well as a diverse assortment of mosses and liverworts. The surface of the peatland typically has small mounds and depressions called hummocks and hollows that are formed by decaying downed trees and tip-up mounds.

Characteristic Species

Trees > 5m

- Balsam Fir
- Black Ash
- Black Spruce
- Eastern Hemlock
- Eastern White Pine
- Northern White Cedar
- Red Maple Tamarack
- Yellow Birch

Shrubs 2-5m

- Red Osier Dogwood
- Silky Dogwood
- Speckled Alder

Shrubs <2m

- Dwarf Red Blackberry

Herbs

- Bladder Sedge
- Bunchberry
- Cattail Species
- Cinnamon Fern
- Fowl Mannagrass
- Lurid Sedge
- Marsh Fern
- Marsh Marigold
- Sensitive Fern
- Spotted Jewelweed
- Spotted Joe Pye Weed
  Woolgrass

Representative Wildlife Species

Mammals

- Raccoon
- Squirrel (red and gray)
- White-Tailed Deer

Amphibians

- Eastern American Toad
- Green Frog
- Jefferson Salamander
- Northern Red Back Salamander
- Red Spotted Newt
- Spotted Salamander
- Spring Peeper
- Western Chorus Frog
- Wood Frog

Birds

- Marsh Wren
- Red Winged Blackbird
  Swamp Sparrow
- Wild Turkey
- Woodpecker Species

2.4.F Silver Maple-Ash Swamp



Location: These swamps are located throughout the Town of Victor.

Size: There are approximately 405.7 acres (1.8%) of silver maple ash swamps within the Town of Victor.

Co-occurrence Areas: These swamps can be found in areas of GC-1, WB-1, FC-2, FC-7, and IC-6.

Description: Silver maple-ash swamps are hardwood basin swamps that occur in poorly-drained depressions or on poorly-drained soils. These swamps are characterized by uniformly wet conditions, with minimal seasonal fluctuation in water levels. The tree canopy is dominated by silver maple and green ash, but typically includes a variety of other hardwood species such as American elm, red maple, swamp white oak, and ironwood on the edges.

During the summer, silver maple-ash communities are rich with vegetation, including ferns, shrubs, and a large variety of herbaceous species. Blueflag iris blooms early in the summer, and spotted jewelweed blooms mid to late summer in this habitat.

Characteristic Species

Trees > 5m

- American Elm
- Black Ash
- Green Ash
- Red Maple
- Silver Maple
- Swamp White Oak
- White Ash

Shrubs 2-5m

- Gray Dogwood
- Nannyberry
- Silky Dogwood
- Speckled Alder
- Spicebush

Vines

- Eastern Poison Ivy

Herbs

- Blueflag
- Cinnamon Fern
- False Nettle
- Fowl Mannagrass
- Fringed Sedge
- Hop Sedge
- Marsh Fern
- Nodding Beggar-ticks
- Ostrich Fern
- Royal Fern
- Sensitive Fern
- Skunk Cabbage
- Spotted Jewelweed
- Wood Nettle
- Virginia Creeper

Representative Wildlife Species

Mammals

- Opossum
- Raccoon
- Red Fox
- Skunk
- Squirrel (red and gray)
- White-Tailed Deer

Amphibians

- Gray Tree Frog
- Green Frog
- Jefferson Salamander
- Northern Leopard Frog
- Northern Red Back Salamander
- Red Spotted Newt
- Spotted Salamander
- Spring Peeper
- Western Chorus Frog

Birds

- American Crow
- American Gold Finch
- American Woodcock
- Barred Owl
- Common Grackle
- Downy Woodpecker
- Great Horned Owl
- Hairy Woodpecker
- Red-Bellied Woodpecker
- Ruffed Grouse
- Swamp Sparrow
- Wild Turkey
- Wood Duck

2.4.G Hemlock Hardwood Swamp

Location: This swamp is located on both sides Log Cabin Road north of the Lower Fishers Road intersection, north of the Thruway.

Size: There are approximately 27 acres (0.1%) of Hemlock Hardwood Swamp habitat are within the Town of Victor.

Co-occurrence Areas: These swamps can be found in areas of IC-2.

Description: The Hemlock Hardwood Swamp is a mixed swamp that occurs on mineral soils and deep muck in depressions which receive groundwater discharge, typically in areas where the aquifer is a basic or acidic substrate.



Photo Credit: New York Natural Heritage Program

These swamps usually have a fairly closed canopy (70 to 90% cover), sparse presence of shrubs, and low species diversity.

This is a common and widespread swamp community. Some occurrences are very small (1 to 2 acres). Water levels in these swamps typically fluctuate seasonally: they may be flooded in spring and relatively dry by late summer.

Characteristic Species

Trees > 5m

- Green Ash
- Hemlock
- Red Maple
- White Pine
- Yellow Birch

Shrubs 2-5m

- Highbush Blueberry
- Pepperbush

Shrubs <2m

- Viburnum Species

Herbs

- Cinnamon Fern
- Goldenrod Species
- Mountain Sorrel
- Sedges Species
- Sensitive Fern

Representative Wildlife Species

Mammals

- Coyote
- Opossum
- Raccoon
- Red Fox
- Skunk
- Squirrel (red and gray)
- White-Tailed Deer

Amphibians

- Gray Tree Frog
- Green Frog
- Jefferson Salamander
- Northern Leopard Frog
- Northern Red Back Salamander
- Red Spotted Newt
- Spotted Salamander
- Spring Peeper
- Western Chorus Frog

Birds

- American Crow
- American Woodcock
- Black Capped Chickadee
- Sparrow
- Wild Turkey

2.4.H Red Maple-Tamarack Peat Swamp

Location: This swamp is located on both sides of Strong Road, south of the State Route 251 intersection and north of Shire Lane.

Size: These are approximately 12.3 acres (0.05%) of Red Maple-Tamarack Peat Swamp within the Town of Victor.

Co-occurrence Areas: These swamps can be found in areas of IC-5.



Photo Credit: New York Natural Heritage Program

Description: Red Maple-Tamarack Peat Swamp thrive on organic soils (peat or muck) in poorly drained depressions. They are often spring fed or enriched by seepage of groundwater resulting in a stable water table and continually saturated soil. Soils are often rich in calcium.

Characteristic Species

Trees > 5m

- Black Ash
- Black Spruce
- Ironwood
- Northern White Cedar
- Red Maple
- Tamarack Species
- White Pine

Shrubs 2-5m

- Alder Species
- Dwarf Raspberry
- Highbush Blueberry
- Red Oiser Dogwood
- Willow Species
- Winterberry

Representative Wildlife Species

Mammals

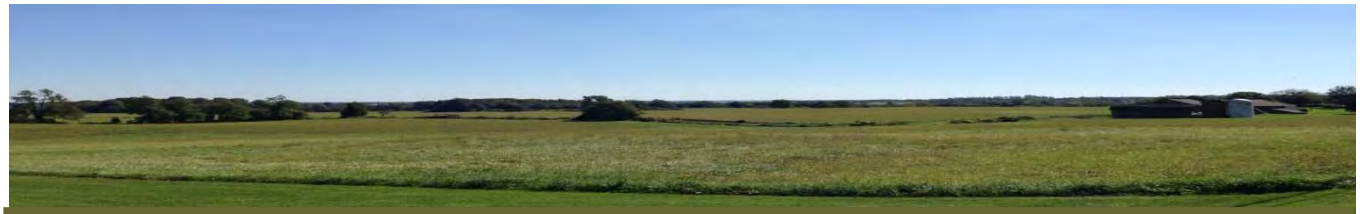
- Raccoon
- Red Fox
- White Tailed Deer

Amphibians

- Gray Tree Frog
- Green Frog
- Jefferson Salamander
- Northern Red Back Salamander
- Northern Leopard Frog
- Red Spotted Newt
- Spotted Salamander
- Spring Peeper
- Western Chorus Frog

Birds

- American Crow
- American Woodcock
- Catbird
- Great Horned Owl
- Hairy Woodpecker
- House Wren
- Marsh Wren
- Red Winged Blackbird



2.5 FARMLAND

Area: The farmland habitat within the Town of Victor total of approximately 4,116 acres 17.9% of the Town's lands. This group of habitats include orchard, cropland, pasture and conifer plantations.

Management: Well-managed farmland can help protect water quality and surrounding wildlife habitats, while providing significant support to the local economy. Unfortunately, improperly planned or implemented agricultural activities can have significant impacts on water quality and result in degradation of wildlife habitats. Runoff from farms can contribute to increased levels of nutrients that can cause algae growth and oxygen depletion in nearby water bodies. Sediment from eroding fields can damage existing natural streams.

2.5.A Orchard

Location: The only orchard in the Town of Victor is The Victor Apple Farm located on NY State Route 444.

Size: There are approximately 76.2 acres (0.3%) of orchards within the Town of Victor.

Co-occurrence Areas: N/A

Description:
The Victor Apple Farm is a stand of cultivated apple trees which has maintained grasses as a groundcover. This orchard is currently actively farmed.



Characteristic Species

- Apple Trees

Representative Wildlife Species

Birds

- American Robin
- Eastern Kingbird
- Mourning Dove
- Rock Pigeon

2.5.B Cropland



Location: Cropland within the Town of Victor is located throughout the Town, but the majority of these lands are located south of the New York State Thruway.

Size: There are approximately 3,339 acres (14.5%) of cropland within the Town of Victor.

Co-occurrence Areas: N/A

Description: Cropland can be defined as an agricultural field planted in field crops such as soybeans, corn, wheat, and barley. This community includes hayfields with timothy, alfalfa, red clover, etc.

Characteristic Species

- Alfala
- Corn
- Hay
- Soybeans

Representative Wildlife Species

Mammals

- Mice/Moles/Voles
- White-Tailed Deer

Birds

- Bobolink
- Mourning Dove
- Sparrow Species
- Upland Sandpiper
- European Starling

2.5.C Pasture

Location: Pastures within the Town of Victor are located throughout the Town. The majority of these lands are located south of the New York State Thruway.

Size: There are approximately 387 acres (1.7%) of pastures within the Town of Victor.

Co-occurrence Areas: N/A

Description: A pasture is agricultural land maintained for livestock grazing.

Characteristic Species

Mammals

- Mice/Moles/Voles
- Rabbit
- Red Fox
- White-Tailed Deer

Birds

- Sparrow Species
- European Starling
- Killdeer



2.5.D Conifer Plantation

Location: Conifer plantations can be found throughout the Town of Victor. The Victor Christmas Tree Farm located on Murray Road is one of the active conifer plantation in the Town of Victor. Many conifer plantations are abandoned and overgrown.

Size: There are approximately 314 acres (1.4%) of conifer plantations within the Town of Victor.

Co-occurrence Areas: N/A

Description: Conifers can be planted for Christmas trees, harvest of timber, or to provide wildlife habitat, soil erosion control, windbreaks, or landscaping. This is a community where pine, spruce, or fir are dominant. These plantations may be monocultures or mixed stands.



Overgrown Christmas tree plantations are very common

Conifer plantations create good cover for birds and mammals species all year round. Unlike Broadleaf trees, which drop leafs during the fall, the needles of conifer trees stay on in the fall and winter. Evergreens can create a good sound and visual buffer for wildlife. Birds use these habitats for their thermal and nesting cover.

The conifer seeds provide food for many bird species. The foliage of the conifer plantation is a food source for white-tailed deer and rabbit species.

Characteristic Species

Trees > 5m

- Fir Species
- Pine Species
- Northern White Cedar
- Spruce Species

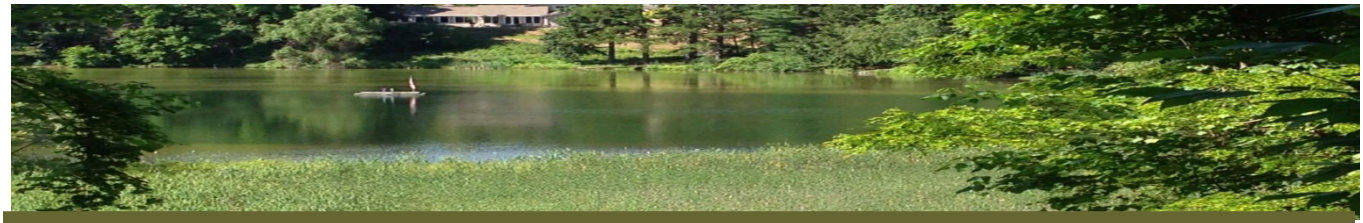
Representative Wildlife Species

Mammals

- Chipmunk
- Coyote
- Raccoon
- Squirrel (red and gray)
- White-Tailed Deer

Birds

- American Crow
- Black Capped Chickadee
- Common Grackle
- Red Breasted Nut Hatch
- Sparrow Species



2.6 OPEN WATER

Area: The open water habitats cover approximately 187 acres (0.80%). These areas include Eutrophic or Kettle Lakes, Confined River and Farm or other Artificial ponds.

Importance: Open water habitats within the Town of Victor create aquatic communities which can provide a food source for the wildlife species living in the area. Kettle Lakes have a geological importance described in Section 1 of the NRI.

Threats: The threat to open water habitats is the intrusion of invasive species such as Phragmites and Cat-tail species. Ponds and streams are regulated by the U.S. Army Corps of Engineers and in some cases the New York State Department of Environmental Conservation. Indirect disturbance to streams from surrounding farm field or urban area stormwater run off can have an effect on downstream habitats if not managed for properly.

Viability: The viability of these habitats due to the regulations protecting them is good. More open water habitats will be created as a result of development and associated stormwater management wetland ponds.

Management: Management of the open water areas include activities maintaining water quality in the ponds and river or stream areas. The NYSDEC Stormwater Management guide has many regulations and guidelines for proper management. Providing vegetative buffers along the open water areas is important. These buffers filter runoff and also provide great wildlife habitat.

2.6.A Eutrophic Ponds (Kettle Lakes)

Location: Kettle Lakes are located throughout the northern portion of the Town. Some of these ponds include Crossmans Pond and Cranberry Ponds.

Size: There are approximately 38 acres (0.1%) of Eutrophic Ponds within the Town of Victor.

Co-occurrence Areas: N/A

Description: Eutrophic Ponds or kettle lake is shallow, nutrient-rich aquatic community. The water is usually green with algae, and the bottom of the pond is mucky. Eutrophic ponds are too shallow to remain stratified throughout the summer. Additional characteristic features of a eutrophic pond include the following: water that is murky, with low transparency and water rich in plant nutrients (especially high in phosphorus, nitrogen, and calcium), and a weedy shoreline. Alkalinity of the ponds is typically high. Species diversity is typically high. Aquatic vegetation can be abundant.



Characteristic Species

Emergent Aquatics

- Cattail Species
- Narrow-leaf Burreed
- Pondweed Species

Representative Wildlife Species

Reptiles

- Common Snapping Turtle
- Painted Turtle

Submerged Aquatics

- Algae
- Bladderworts
- Coontail
- Duckweed
- Pondweeds
- Broad Waterweed
- Water Starwort
- Waterweed
- White Water-Lily
- Yellow Pond-Lily
- Sago Pondweed
- Spiral Pondweed

Amphibians

- Bull Frog
- Eastern American Toad
- Cattail Species
- Narrow-leaf Burreed
- Green Frog
- Northern Leopard Frog
- Spiral Pondweed

2.6.B Confined River

Location: The Confined Rivers of The Town of Victor include Irondequoit Creek in the northwestern section of the Town and Ganargua Creek located in the eastern section of the Town.

Size: There are approximately 35 acres (0.2%) of the Confined Rivers within the Town of Victor.

Co-occurrence Areas: N/A

Description:
The Confined Rivers are relatively large, fast flowing with a moderate to gentle gradient (1-5%). They have generally well-defined pattern of alternating pools, riffles, and runs. Most of the erosion within the river



bed is lateral, creating channel islands, and bars, and deposition is moderate with a mix of coarse rocky to sandy substrate.

Irondequoit Creek has high water clarity and is well oxygenated. Fish diversity is moderate, with Irondequoit Creek being cold water and Ganargua Creek being warm water fisheries.

Characteristic Species

Emergent Aquatics

- Cattail Species
- Narrow-leaf Burreed
- Pondweed Species

Submerged Aquatics

- Broad Waterweed
- Sago Pondweed
- Spiral Pondweed

Representative Wildlife Species

Fish

- Brook Trout
- Brown Trout
- Common Shiner
- Creek Chub
- Rainbow Trout
- Shiner Species

Amphibians

- Green Frog
- Leopard Frog

Reptiles

- Painted Turtle
- Snapping Turtle

Birds

- Canada Goose
- Mallard

2.6.C Farm Pond/Artificial Pond

Location: The Farm Ponds and/or Artificial Ponds (stormwater ponds, residential ponds, etc.) are located throughout the Town of Victor.

Size: There are approximately 114 acres (0.5%) of Farm/Artificial Ponds within the Town of Victor.



Co-occurrence Areas: N/A

Description: These aquatic communities can be found on agricultural or residential properties. The ponds are often eutrophic, and may be abundant with panfish such as bluegill, yellow perch or bass.

Characteristic Species

Emergent Aquatics

- Cattail Species
- Narrow-leaf Burreed
- Pondweed Species

Submerged Aquatics

- Broad Waterweed
- Sago Pondweed
- Spiral Pondweed

Representative Wildlife Species

Amphibians

Eastern American Toad
Green Frog

- Leopard Frog

Birds

Black Duck
Canada Goose

- Mallard



2.7 RECREATIONAL, RESIDENTIAL AREAS

Area: This habitat covers approximately 6,040 acres (26.4%). The groundcover is dominated by maintained grasses and forbs, and can include some tree cover, and ornamental and/or native shrubs.

Location: Recreational and residential areas are located throughout the Town of Victor.

Size: There are approximately 6,040 acres (26.4%) of recreational and residential areas within the Town of Victor.

Co-occurrence Areas: N/A

Description: From a habitat standpoint, open space include landscaped residential areas, park areas, golf courses and sport fields.

Representative Wildlife Species

Mammals

- Chipmunk
- Mice/Moles/Voles
- Rabbit
- White-Tailed Deer

Birds

- American Crow
- American Robin
- Barn Swallow
- Blue Jay
- Eastern Bluebird
- European Starling
- Mourning Dove
- Rock Pigeon
- Sparrow Species

Amphibians

- Eastern American Toad

Reptiles

- Common Gartner Snake

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TOWN OF VICTOR NRI - VOLUME 2
15. STEEP SLOPE ASSESSMENT

TOWN OF VICTOR
STEEP SLOPE ASSESSMENT AND POLICY
February, 2014

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STEEP SLOPE ASSESSMENT AND POLICY

PURPOSE

The Steep Slope Assessment and Policy will:

- Complement the steep slope references found in other Town documents in a way that fills that gap and meets the need for a single, cohesive policy regarding the evaluation of proposals to avoid, disturb, re-grade or eliminate steep slopes;
- Be adopted in a way that will support the Green Infrastructure review process ultimately called for in the Comprehensive Plan;
- Provide the information needed to establish steep slope regulatory standards in the Town code, thereby facilitating the development proposal approval process for Town boards, Victor residents and developers.

BACKGROUND



Figure 15.1 Steep Slope (Town of Victor Photograph)

The topography of the Town of Victor is quite variable and includes many hills and valleys. Although some areas contain more slopes than others, slopes of 25% or greater grade are found throughout the Town. References to steep slopes and to measures intended to safeguard the Town of Victor from negative impacts associated with disturbance to such slopes can be found in various Town of Victor documents such as the Town Comprehensive Plan, Town Codes, and the Town Design and Construction Standards. In addition, projects being reviewed by any Town board that include proposals to disturb, re-grade or eliminate slopes may also be evaluated for significant adverse environmental impacts as part of a required State Environmental Quality Review (SEQR) process.

These requirements notwithstanding, the Town has had no formal policy regarding the evaluation of proposals to disturb steep slopes, the factors to be taken into account in such an evaluation, or the process to determine which proposals merit a low level of scrutiny versus a moderate or high level of scrutiny.

Furthermore, as this phase of the Natural Resources Inventory is being composed, the Town is also considering revisions to a chapter of the draft Comprehensive Plan (see the chapter on Green Infrastructure). The Green Infrastructure chapter of the Comprehensive Plan includes a specific goal to “Respect and protect the natural topography” (Goal E). This chapter also includes recommendations regarding implementation of a more formalized review of land use proposals.

QUANTIFICATION OF STEEP SLOPES

Steep slopes are typically characterized by their "steepness," a characteristic generally expressed as a percentage grade or angle of incline. When used in this manner, the terms "grade" and "incline" are synonymous with other terms such as slope, gradient and pitch. This document references steepness as a percentage grade. Percentage grade represents the vertical change in elevation, also referred to as "the rise," relative to the horizontal change in location, also referred to as "the run."

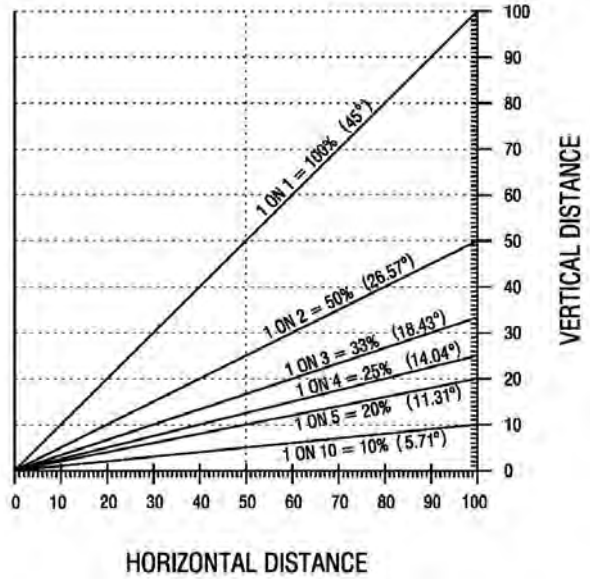


Figure 15.2 Illustration of Percentage Grade

For example, a slope upon which the elevation increases 10 feet over a horizontal distance of 100 feet would represent a grade or slope of 10%. A steeper slope upon which the elevation increases 25 feet over a horizontal distance of 100 feet would represent a grade or slope of 25% and a slope upon which the elevation increases 100 feet over a horizontal distance of 100 feet would represent a grade or slope of 100%. The preceding figure illustrates a range of percentage grades. As a frame of reference, the following approximate grades are encountered at the indicated locations:

- Eastview Mall parking lot which is largely 4%;
- Lane Rd at Taylor Rise = 8%;
- Lane Rd at Rte 96 = 9%;
- Willow Brook east of NYS Thruway overpass = 9.7%;
- Lynaugh Rd at Rte 96 = 12.5%; and,
- Gillis Rd at west side of Victor Egypt Rd = 15%.

STEEP SLOPE CONCERNS

In broad terms, governmental policies restricting the ability to disturb, re-grade or eliminate steep slopes typically reflect one or more concerns:

- Future slope stability and resistance to movement under anticipated loads or other forces to which the slope may be subjected;
- The difficulty anticipated in restoring and/or re-vegetating disturbed or new slopes;
- Associated risks to nearby resources (e.g., watercourses, wetlands and agricultural fields) or to nearby structures and improvements (e.g., buildings, roadways and storm sewers) should a disturbed or re-graded slope fail or erode;

- Loss of a slope's functional contribution to ecology[1] including that to habitat, wildlife corridors and connectivity;
- Loss of a slope's contribution to community character, community identity and the community's "sense of place;" and
- Loss of a slope that exemplifies a unique land form or that functions as a significant component of an aesthetic viewscape or geologic resource important to the community.

This document sets forth a Town of Victor policy regarding slopes and the evaluation of proposals to disrupt, re-grade or eliminate steep slopes. The policy identifies factors to be considered in evaluating proposals with the potential to affect steep slopes. This document also presents an assessment tool intended to indicate the general level of scrutiny required for a given proposal.

PROPOSED POLICY

The Town of Victor finds that each of the concerns listed in the foregoing section should be considered in decision-making relative to disturbance or development of steep slopes. The Town also finds that classification by percentage grade alone is insufficient to indicate the level of scrutiny required.

The Town of Victor policy regarding evaluation of proposals to disturb, re-grade or eliminate steep slopes is as follows:

1. In order to account for all of the interests at stake, proposals must be evaluated according to multiple factors.
2. The level of scrutiny required in the review of a given proposal depends upon the number of factors found to be relevant to a particular proposal as well as the level of potential risk associated with each relevant factor.
3. Evaluation of proposals and determination of the required level of scrutiny must take each of the following relevant factors into account:
    a. Grade;
    b. Soil Erodibility/Depth to Bedrock;
    c. Hydrology/Groundwater;
    d. Stability/Geo-mechanical Characteristics;
    e. Vegetation;
    f. Wildlife Habitat Value;
    g. Co-occurrence and Diversity;
    h. Unique Land Forms / Aesthetic Value; and,
    i. Contribution to Community Character.

[1] Ecology is the study of interactions among organisms, including humans, and their environment.

4. Evaluation and level of scrutiny must recognize the potential for different slopes of an equivalent grade to exhibit a range of sensitivities when evaluated according to multiple factors.
5. As the relevant factors listed above are independent in many regards, an evaluation must recognize the potential for multiple factors to cumulatively elevate the concern regarding a moderately steep slope to a greater level than that of a much steeper slope. For example, disturbance of a wooded 10% slope with highly-erodible soils, located adjacent to a watercourse and an intervening wetland could be viewed with significantly more concern than disturbance of a grassy 15% slope with stable soils and with no watercourses or wetlands nearby.
6. The potential for significant adverse impacts which are identified in an evaluation of a proposal to disturb, re-grade or eliminate a slope shall be avoided. Efforts to avoid such potential impacts shall include consideration of feasible alternatives that would accomplish many of the same project objectives with less impact or reduced risk of an impact. Likewise, impacts and potential impacts that remain shall be minimized to the extent it is practical to do so.
7. All proposals to disturb, re-grade or eliminate a slope having an average grade of more than 10 percent from top to toe shall be evaluated by the Town Planning Board when made in connection with a request for Planned District approval, Site Plan, Subdivision, Special Use Permit or other Planning Board approval.
8. All proposals to disturb, re-grade or eliminate a slope having an average grade of more than 25 percent from top to toe shall require site plan approval from the Town Planning Board whether or not made in connection with a request for any Planning Board approval.
9. Proposals to disturb, re-grade or eliminate slopes of more than 10 percent from top to toe should be evaluated according to the factors described in the sections which follow.
10. Table 15.3 should be relied upon as general indicator of the level of scrutiny required in evaluating a specific proposal to disturb, re-grade or eliminate a slope.

IMPLEMENTATION

Regarding implementation, the following is recommended:

1. This policy and criteria described below should be incorporated within the Town's Design and Construction Standards.
2. The Town Code should be amended to require site plan approval for proposals to disturb, re-grade or eliminate slopes having an average grade of more than 25% from top to toe as described in the foregoing policy statement.
3. Application forms for grading or disturbance of land should be amended to require information relative to grade of any slopes proposed for disturbance, re-grading or elimination.
4. The preservation of steep slopes is a primary green infrastructural component in terms of sustainability, storm water quality planning and ecological design. NYS DEC policies

regarding preservation of steep slopes in development and storm water pollution prevention planning and design should be relied upon. In addition, the Town's Natural Resource Inventory should be made available to serve as a basis for initial determinations relative to the maximum grades found within areas proposed for disturbance.

5. Coordinated site walks, including representatives of all deliberating bodies, should be required as part of any evaluation called for in the policy described above.
6. The Town Planning Board and Conservation Board should retain authority to confer with Town consultants when necessary to complete evaluations called for in the policy described above.
7. Evaluations of the feasibility for a given site to accommodate or support a given level of development or density should not be limited to consideration of acreage and zoning but should also consider the range of grades found upon a site from a three-dimensional perspective. The Town Planning Board should be empowered to require submittal of three-dimensional topographic maps and three-dimensional proposed grading plans where planimetric maps could be deceiving or inadequate to accurately depict potential effects.

ASSESSMENT TOOLS

DESCRIPTION OF RELEVANT FACTORS FOR ASSESSMENT & EVALUATION

The relevant factors identified in the narrative are characterized and described in more detail as follows:

GRADE

- **Characterization of the Factor** – This factor indicates the steepness of slopes encountered on a site. Two measures are important to characterize the slope of a given area under consideration: 1) the average grade encountered over an area that includes slopes; and, 2) the maximum grade encountered when considering only an increment of a slope (for example, the increase in elevation over any incremental change of 30 feet in horizontal location).
- **Ecologic Basis** – In general, the risk to other ecological resources associated with the disturbance of an existing slope increases as the grade increases.
- **Objective** - The objective relative to grade is two-fold: 1) to assist in the evaluation of other relevant factors where the percent grade is a factor that may elevate risks; and, 2) to identify slopes that are so steep that evaluation is required whether or not the proposed activity is part of a plan requiring Planning Board review for other reasons.
- **Performance Requirement** –The grade of a slope must be taken into account when evaluating a proposal according to other relevant factors. Proposed disturbance of slopes of more than 10% grade should be evaluated by the Town Planning Board in conjunction with other approvals. Proposed disturbance of slopes of more than 20% grade should be reviewed by the Town Planning Board whether or not any other approval is required.
- **Measures or Limitations –** Requirements related to other criteria shall not be determined without consideration of the slope grade. Proposed disturbance to slopes of more than 20% grade shall always be evaluated by the Town Planning Board.
- **Variables for Consideration** – The threshold beyond which existing slopes should not be disturbed without prior review is affected by other factors, primarily soil type and proximity other resources. The boundary described in this section is an absolute regarding slopes that should not be disturbed without prior review regardless of soil types and proximity to other resources.
- **Potential Alternatives** – Elimination, rather than mere disturbance, of a slope with a grade greater than 10% may be considered when the slope's value, as determined by other factors, is very low and where some economic or ecological value would be improved by the presence of a less steep slope.

SOIL ERODIBILITY / DEPTH TO BEDROCK

- **Characterization of the Factor** – This measure assesses two factors that influence the relative likelihood that a slope will erode. The susceptibility or resistance to erosion of a soil depends upon its structure including composition and particle size. The National Resources Conservation Service (NRCS) identifies subclasses of soils for which the susceptibility to erosion is a hazard affecting their use. NRCS classifies land as highly erodible and as potential highly erodible[2]. In general, shallow soils (little depth to bedrock) may also exhibit greater vulnerability to erosive forces.
- **Ecologic Basis** – Soils vary with respect to their resistance to erosive forces. In addition to soil composition or type, soil depth and potential exposure of bedrock can influence soil resistance to erosive forces. In addition to degrading a slope, erosion and transport of sediments in stormwater runoff can pose a significant threat to nearby resources such as floodplains, wetlands and watercourses.
- **Objective** – The ultimate objective is to avoid instances in which development increases the risk of erosion. Additional objectives related to this factor are the avoidance of disturbance to slopes with an elevated risk of erosion, and the greater scrutiny of proposed disturbance and restoration of slopes with an elevated risk of erosion.
- **Performance Requirement** – The requirement is two-fold: 1) Disturbance to slopes proposed as part of development shall not increase the risk of erosion; and 2) Where the pre-existing level of risk for erosion upon a slope proposed for disturbance or re-grading is high, the proposed development shall be required to eliminate the elevated risk, to the extent it is practical to do so.
- **Measures or Limitations –** Development shall not elevate the risk of erosion. Slopes already subject to an elevated risk of erosion shall not be disturbed unless development can proceed in a manner which will reduce or eliminate an elevated risk of erosion (subject to potential conflicts with assessments according to other factors).
- **Variables for Consideration** – The extent to which elevated risks of erosion would threaten nearby resources such as floodplains, wetlands and watercourses must be considered. An apparent opportunity to reduce pre-existing risks of erosion through re-grading must be evaluated relative to other considerations where a negative impact could result (such as impacts to vegetation, co-occurrence, wildlife habitat, contribution to community character, and unique land forms).
- **Potential Alternatives** – Engineering alternatives proven to preclude an elevated risk of erosion.

[2] Part 622 – Interpretive Groups, Section 622.04 at http://soils.usda.gov/technical/handbook/contents/part622.html

HYDROLOGY / GROUNDWATER

- **Characterization of the Factor** – This measure assesses the presence of seeps, springs, groundwater and/or other hydrological features on or within a slope.
- **Ecologic Basis** – As water reduces friction, the presence of water within a slope can decrease the stability of the slope as a whole, thereby increasing the risk of soil movement and/or slope failure. As gravity will accelerate water present on the surface of a slope, the likelihood for infiltration of water located upon the surface of a slope is reduced. As water is an erosive agent, the presence or outflow of water on the surface of a slope can elevate the risk of erosion and impede restoration efforts. Finally, slopes can include hydrological features that contribute to the local ecology and could be lost or compromised were the slope to be disturbed, re-graded or eliminated.
- **Objective** - The objective is to ensure that the hydrological factors relevant to slope stability, risk of erosion, threats to successful restoration and loss of hydrological resources are taken into account in evaluating proposed disturbance, re-grading or elimination of slopes.
- **Performance Requirement -** Proposed disturbance, re-grading or elimination of slopes shall only be undertaken in a manner which avoids: 1) decreases in the stability of an affected slope, 2) increases in the risk of erosion upon an affected slope, 3) reduction of the likelihood for successful restoration of an affected slope, and/or 4) the loss of a valued hydrological resource.
- **Measures or Limitations –** Disturbance, re-grading or elimination of slopes shall not affect hydrology and/or groundwater in a manner that will decrease the stability of an affected slope, will increase the risk of erosion upon an affected slope, will diminish the likelihood for successful restoration of an affected slope, and/or destroy or significantly impair a valued hydrological resource.
- **Variables for Consideration** – Grade, soil classification, hydrology, vegetation and stability/structural loading need to also be taken into account.
- **Potential Alternatives** – Engineering alternatives effective at preserving the stability of an affected slope, limiting the risk of erosion upon an affected slope, ensuring the successful restoration of an affected slope, and retaining or duplicating the ecological function of a hydrological resource present within a slope should be considered.

STABILITY / GEO-MECHANICAL CHARACTERISTICS

- **Characterization of the Factor** – This factor is intended to capture pre-existing conditions not directly related to grade, soil or hydrology that would compromise the stability of a slope and/or exceptional factors related to the load anticipated to be imposed upon a slope that could diminish the stability of a slope.
- **Ecologic Basis** – Pre-existing man-made or other conditions may impair the ability of a slope to withstand disturbance, re-grading or development. Examples could include: the prior installation of foundations or other improvements originally intended to support a slope or nearby structure, prior excavation that has disrupted the existing soil profile within a slope, placement of conduits or other improvements within a slope, or the presence of layers or rock or dissimilar soils within the slope profile. In addition, the plan to subject a slope to an unusual or exceptional load could also threaten slope stability.
- **Objective** - The objective is two-fold: 1) to ensure that all pre-existing conditions, man-made or otherwise, with the potential to diminish slope stability are taken into account in evaluating proposed disturbance or development upon a slope, and 2) to ensure that exceptional factors related to the load to be imposed upon a slope are taken into account in evaluating proposed disturbance or development upon a slope.
- **Performance Requirement -** Disturbance, re-grading and development upon slopes shall only be undertaken in a manner that preserves or improves slope stability.
- **Measures or Limitations -** Pre-existing conditions and unusual load requirements notwithstanding, disturbance, re-grading and development upon slopes shall not diminish or impair slope stability and shall restore the stability of unstable slopes to an acceptable level where it is practical to do so.
- **Variables for Consideration** – Other factors with the potential to influence slope stability such as grade, soil, hydrology and vegetation.
- **Potential Alternatives** – Engineering alternatives effective at preserving the stability of an affected slope.

VEGETATION

- **Characterization of the factor** – This vegetation factor is intended to reflect: 1) the inherent resource value of vegetation present on a slope that could be disturbed, degraded or lost as a consequence of disturbance, re-grading or elimination of a slope; 2) the ease or difficulty that should be anticipated in re-vegetating a slope following disturbance or regarding; and, 3) the effects to slope stability or risk of erosion related to disturbance or loss of existing vegetation and/or difficulties in re-vegetation of a disturbed slope.
- **Ecologic Basis** – In some instances, vegetation present on a slope may have inherent value as a natural resource regardless of how it might affect other resources. An example could be a mature stand of hardwoods, particularly given that many remaining stands of woods are now found on slopes too steep to farm. Grade, soil types, hydrology and other factors can complicate or impede efforts to re-establish vegetation on disturbed slopes. As vegetation can play a role in resisting erosion and in slowing stormwater run-off, absence of vegetation on slopes can lead to other detrimental effects such as erosion, reduced water quality of runoff and higher peak rates stormwater discharge. Finally, the presence of vegetation, particularly more mature stands of trees, can contribute to slope stability and removal of such vegetation can result in diminished stability.
- **Objective** - The objective is three-fold: 1) avoid loss or damage to on-slope vegetation that represents a valuable natural resource in its own right (e.g., a stand of mature hard woods); 2) avoid disturbance of on-slope vegetation where there is a significant risk for efforts to reestablish vegetation to fail; and, 3) avoid disturbance of on-slope vegetation where such loss or disturbance would increase the risk of slope failure or erosion.
- **Performance Requirement** – Disturbance, re-grading or elimination of vegetated slopes should only be undertaken in a manner that recognizes and responds to the status of on-slope vegetation as a valuable natural resource in its own right, in a manner that avoids disturbance of on-slope vegetation where reestablishment of vegetation may fail, and in a manner that does not increase the risk of slope failure or erosion as a result of the disturbance of on-slope vegetation.
- **Measures or Limitations -** – Significant disturbance or destruction of on-slope vegetation recognized as a valuable natural resource in its own right must always be avoided to the maximum extent practicable. Where unavoidable impacts to on-slope vegetation recognized as a valuable natural resource remain, the impacts must be minimized and mitigation for unavoidable impacts must be considered. On-slope vegetation shall not be disturbed or destroyed where conditions indicate that reestablishment of vegetation may fail. On-slope vegetation shall not be disturbed or destroyed where doing so would increase the risk of slope failure or erosion.
- **Variables for Consideration** – With respect to potential impacts to on-slope vegetation recognized as a natural resource, the quality and value of the resource should be taken into account, as should the degree to which the presence and extent of the resource may contribute to other criteria such as slope stability and habitat. With respect to reestablishment

of vegetation, the importance of vegetation in the particular location to stabilize slopes and resist erosive forces should be taken into account. With respect to diminished slope stability and increased risk of erosion, other factors such as grade, soil type, hydrology and slope stability should be taken into account.

- **Potential Alternatives** – Engineering alternatives proven effective in stabilizing slopes, resisting erosion and facilitating reestablishment of vegetation, as well as alternatives regarding the development of protective zones of vegetation at the foot of disturbed slopes adjacent to vulnerable resources.

WILDLIFE HABITAT VALUE

- **Characterization of the Factor** – This factor is intended to reflect the wildlife habitat value contributed by a slope and associated features. For example, what vegetation or surface waters are associated with the slope being considered for disturbance, regrading or elimination?
- **Ecologic BAsis** – Steep slopes remain as the areas least disturbed by farming and development. Farming of steep slopes is generally impractical, and development will typically avoid steep slopes for economic reasons when it is practical to do so. Many steep slopes are also associated with adjacent wetlands, floodplains and waterways which likewise have remained undisturbed by farming and development. Together these complexes frequently provide valuable wildlife habitat. Furthermore, these areas frequently display a linear orientation wherein larger habitat areas or hubs are connected by more narrow habitat corridors. Such corridors can significantly contribute to habitat value by linking areas of more extensive habitat. Loss of habitat, and especially of critical habitat corridors, can result in adverse impacts to species reliant upon the habitat.
- **Objective** - Avoiding diminution of wildlife habitat value through disturbance, re-grading or elimination of a slope which contributes to habitat, perhaps as part of an associated complex of resources.
- **Performance Requirement** – Slopes should not be disturbed, re-graded or eliminated where doing so would degrade an area having important value as wildlife habitat.
- **Measures or Limitations** - Significant disturbance or destruction of slopes contributing significantly to wildlife habitat must always be avoided to the maximum extent practicable. Where unavoidable impacts to wildlife habitat remain, the impacts must be minimized, and mitigation for unavoidable impacts must be considered. Restrictions upon disturbance, re-grading or elimination of slopes contributing to wildlife habitat should be proportional to the value and importance of the habitat in question, the extent to which the habitat value would be diminished, and the degree to which it would be unlikely for that contribution and the affected habitat to recover over time.
- **Variables for Consideration** – Considerations should include the value of the wildlife habitat provided or contributed to by the slope, including the extent of the affected area and the role played in connecting multiple areas of habitat; the feasibility for a degraded contribution to recover over time; and the opportunity for nearby habitat to compensate for any lost contribution.
- **Potential Alternatives** – Alternatives that would accomplish much of the development agenda with significantly less impact to wildlife habitat.

CO-OCCURRENCE AND DIVERSITY

- **Characterization of the Factor** – This factor is intended to reflect how the ecologic value of natural areas such as wood lots, wetlands, floodplains and watercourses can be influenced by the co-location of steep slopes.
- **Ecologic Basis** – Independent of the contribution to wildlife habitat, the community places value on the presence and persistence of certain natural areas such as wood lots, wetlands, floodplains and watercourses. Ecologic value is enhanced by the diversity that results when these resources are co-located. Steep slopes are frequently found in areas where these resources converge and contribute to the diversity that increases ecologic value. Disturbance, re-grading or elimination of slopes contributing to the diversity and ecologic value of an area has the potential to diminish that diversity and the associated value to the community.
- **Objective** - Avoiding diminution in the value of natural areas as a consequence of disruption, re-grading or elimination of co-located slopes that enhance the value of such areas.
- **Performance Requirement** – Slopes should only be disturbed, re-graded or eliminated in a manner that does not diminish the ecologic value of co-located natural areas such as wood lots, wetlands, floodplains and watercourses.
- **Measures or Limitations** - Significant disturbance or destruction of slopes contributing significantly to the value of natural areas such as wood lots, wetlands, floodplains and watercourses with which the slope is co-located must be avoided wherever practical. Where unavoidable impacts to the value of such areas remain, the impacts must be minimized, and mitigation for unavoidable impacts must be considered. Restrictions upon disturbance, re-grading or elimination of such slopes should be proportional to the value and importance of the habitat in question and the extent to which that value would be diminished by disturbance, re-grading or elimination of the steep slope.
- **Variables for Consideration** – The value and importance of the habitat in question and the extent to which that value would be diminished by disturbance, re-grading or elimination of the steep slope in question should be considered. The extent to which the same area also contributes to wildlife habitat should also be considered.
- **Potential Alternatives** – Project alternatives that would accomplish much of the development agenda with significantly less impact to valued natural areas where steep slopes are co-located with wood lots, wetlands, floodplains and watercourses.

UNIQUE LAND FORM / AESTHETIC VALUE

- **Characterization of the Factor** – This factor is intended to reflect the value contributed to the community by unique land forms and/or recognizable viewscapes of exceptional aesthetic value.
- **Ecologic Basis** – In addition to the rolling hills and steep slopes found throughout the community, Victor's glaciated past has also left behind a number of unique land forms including moraines, drumlins, eskers, kames and kettles. Steep slopes are found as part of these unique land forms, particularly with respect to drumlins. In addition, a number of recognizable viewscapes noted for their aesthetic or community value are found within Victor (see Section 1.2). Where steep slopes are associated with or part of these forms and viewscapes, proposals to disturb, re-grade or eliminate such slopes have the potential to diminish the value present in the form or viewscape.
- **Objective** - The objective is to avoid diminishing the value of vulnerable unique land forms and/or viewscapes through disturbance, re-grading or elimination of associated or component slopes.
- **Performance Requirement** – The value of unique land forms and recognized aesthetic viewscapes must be retained despite apparent needs to undertake modifications to associated or component slopes.
- **Measures or Limitations –** Slopes shall not be disturbed, re-graded or eliminated in any manner that would degrade or diminish the value of a unique land form and/or a recognizable aesthetic viewscape.
- **Variables for Consideration** – Although there should be little tolerance for negative impacts to unique land forms and recognizable aesthetic viewscapes, the significance of the affected form or viewscape and the level of potential impact should be taken into account.
- **Potential Alternatives** – Project alternatives that would accomplish similar project objectives without diminishing the value of a unique land form and/or a recognizable aesthetic viewscape.

CONTRIBUTION TO COMMUNITY CHARACTER

- **Characterization of the factor** – This factor is intended to reflect the extent to which steep slopes throughout the community contribute cumulatively to residents' perception of community character and their "sense of place" relative to Victor. The community character factor focuses less upon particular slopes having exceptional characteristics and more upon the cumulative contribution of all slopes throughout the community as suggested by the question: "Would Victor seem the same if a large proportion of the steep slopes present in town were subjected to significant re-grading or elimination?"
- **Ecologic Basis** – As a class, steep slopes throughout the community contribute cumulatively to residents' perception of community character and their "sense of place" relative to Victor. Slopes serve as visual landmarks and, in some instances, screen or buffer less attractive viewscapes. This perceptual contribution is not merely visual, as many slopes also serve to attenuate sound and buffer locations from traffic and other noise. The progressive and incremental re-grading and elimination of all or most slopes on a site (as takes place when a site is subject to extensive mass grading) has potential to lead to an extensive, cumulative, and community-wide effect that could diminish residents' perception of community character, their experience of the Town and their "sense of place" relative to Victor.
- **Objective** - The objective is avoidance of scenarios in which so many Victor slopes are re-graded or eliminated that the community character or sense of place is diminished.
- **Performance Requirement** – Residents' perception of the character of the Victor community should not be needlessly degraded through re-grading and elimination of slopes with the potential to cumulatively result in an extensive effect despite an incremental progression.
- **Measures or Limitations –** Mass-grading and significant re-configuration of site topography must be avoided wherever practical. Simply put, the concept of a development being made to fit the site, rather than the reverse, applies to topography and grading just as it applies to conservation of resources such as watercourses, wetlands and forested areas. Significant re-grading or elimination of slopes *en-masse* must be avoided wherever practical. Where such re-grading and elimination proves unavoidable, the extent must be minimized and mitigation for unavoidable impacts must be considered. Restrictions upon significant re-grading or elimination of slopes *en-masse* should also reflect how the topography of the involved site contributes to residents' perception of community character and their sense of place relative to Victor.
- **Variables for consideration** – How the topography of particular site contributes to residents' perception of community character and their sense of place relative to Victor
- **Potential Alternatives** – Project alternatives that would accomplish much of the development agenda with significantly less impact to slopes and to community character and sense of place.

ASSESSMENT TO DETERMINE AN INDICATED LEVEL OF SCRUTINY

As previously discussed, the policy established in this document does not rank or classify steep slopes by grade alone and recognizes that multiple slopes of an equivalent grade may exhibit a range of sensitivities when evaluated according to multiple factors. The Victor policy also anticipates the possibility for multiple factors to cumulatively elevate the concern regarding a moderately steep slope to a greater level than that of a much steeper slope.

Table 15.3 is offered as a tool to be used in connection with the classification of proposals to disturb, re-grade or eliminate slopes. It is not intended that the classification serve as a final indicator of the extent to which an assessed slope should be left undisturbed, disturbed, re-graded or eliminated. Rather, the tool is intended to distinguish those proposals which merit a low level of scrutiny from those which merit a moderate or even a high level of scrutiny. While a final evaluation will still be needed, the relative comparisons, weighting and judgments required for a final evaluation are believed to be too complex to capture in a simple arithmetic table.

The following is suggested regarding use of the tool to approximate the required level of scrutiny:

> *Low Level of Scrutiny*: Cumulative points of 40 or less and no more than two instances of 3 points being assigned to a factor.
>
> *Moderate Level of Scrutiny*: Cumulative points of more than 40 but less than 60 and no more than two instances of 5 points being assigned to a factor.
>
> *High Level of Scrutiny*: Cumulative points of more than 60 or more than two instances of 5 points being assigned to a factor.

TABLE 15.3
EVALUATION &ASSESSMENT OF STEEP SLOPE DEVELOPMENT

Assessment Worksheet: Level of Scrutiny Indicated by Classification According to Multiple Factors

Factors	Assigned Points	Possible Points	Ranking Guide
Grade			
Average Grade		5	5% to 10% - 1 pt; 10% to 15% - 2 pts; 15% to 20% - 3 pts; 20% to 25% - 4 pts; more than 25% - 5 pts
Maximum Grade (over any run of 30 feet)		5	10% to 20% - 1 pt; 20% to 30% - 2 pts; 30% to 40% - 3 pts; 40% to 50% - 4 pts; more than 50% - 5 pts
Soil & Bedrock			
Soil Erodibility		5	Not Elevated - 1 pt; Potentially High - 3 pts; Highly Erodible - 5 pts.
Depth to Bedrock		5	6 ft or more - 1 pt; 3 to 6 feet - 3 pts; 0 to 3 feet - 5 pts.
Hydrology & Groundwater			
Seeps or springs indicate water within the slope		5	Present, but minimal extent and low flow - 1 pt; Moderate extent or flow - 3 pts; Extensive or high flow - 5 pts.
Water flowing across the slope surface		5	Minimal extent or flow - 1 pt; Moderate extent or flow - 3 pts.; Extensive or high flow - 5 pts.
Stability & Geo-mechanical Characteristics			
Preexisting man-made or other conditions compromise stability		5	Minimal extent or influence - 1 pt; Moderate extent or influence - 3 pts.; Extensive or high influence - 5 pts.
Slope will be expected to sustain an exceptional load or force		5	Exceptional load or force: Minimal - 1 pt; Moderate - 3 pts; High - 5 pts.
Vegetation			
Resource value of vegetation present on the slope		5	Minimal value - 1 pt; Moderate value - 3 pts.; Highly valued - 5 pts.
Difficulty anticipated in reestablishing vegetation		5	Minimal difficulty - 1 pt; Moderate difficulty - 3 pts.; Great difficulty- 5 pts.
Degree to which vegetation loss will increase risk of failure or erosion		5	Minimal increase - 1 pt; Moderate increase - 3 pts.; Very significant increase- 5 pts.

TABLE 15.3
EVALUATION &ASSESSMENT OF STEEP SLOPE DEVELOPMENT

Assessment Worksheet: Level of Scrutiny Indicated by Classification According to Multiple Factors

Factors	Assigned Points	Possible Points	Ranking Guide
Wildlife Habitat Value			
Value and importance of habitat potentially affected		5	Minimal value - 1 pt; Moderate value - 3 pts.; Highly valued - 5 pts.
Extent or level of potential affect		5	Minimal affect - 1 pt; Moderate affect - 3 pts.; Greatly affected - 5 pts.
Potential for habitat recovery or for other habitats to compensate		5	High potential- 1 pt; Moderate potential- 3 pts.; Little or no potential- 5 pts.
Co-occurrence and Diversity			
Resource overlap and/or value/importance of area potentially affected		5	Minimal overlap or value - 1 pt; Moderate overlap or value - 3 pts.; High degree of overlap or highly valued - 5 pts.
Extent or level of steep slope contribution		5	Minimal contribution - 1 pt; Moderate contribution - 3 pts.; Very significant contribution- 5 pts.
Unique Land Form / Aesthetic Value			
Value and importance of land form or viewscape		5	Minimal value - 1 pt; Moderate value - 3 pts.; Highly valued - 5 pts.
Extent to which proposed disturbance will diminish value		5	Minimal affect - 1 pt; Moderate affect - 3 pts.; Greatly affected - 5 pts.
Contribution to Community Character			
Contribution of the site to community character		5	Compared to many comparable sites: Less contribution - 1 pt; Equivalent contribution - 3 pts; Greater contribution - 5 pts
Extent to which proposed grading would dimiinish the contribution		5	Acreage proposed for re-grading and potential diminution of contribution: Minimal - 1 pt; Moderate - 3 pts; High - 5 pts
TOTALS	**0**	**100**	

TOWN OF VICTOR NRI - VOLUME 2
16: OPEN SPACE INDEX

Open Space Index
Town of Victor

2014

Reflects Data Available through December 2013

Previous Open Space Index Approved by
Victor Town Board in 1974

Town of Victor

Open Space Index

2014

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Town of Victor

Open Space Index

2014

Statement of Purpose

The purpose of the Town of the Victor Open Space Index is to identify, describe and map the Open Space in the Town, consisting of significant agricultural, natural and cultural resources, and to determine the extent of various types of Open Space townwide and in individual parcels.

New York State Environmental Conservation Law Section 239-y identifies the preparation of an inventory of "conservation open areas" as one of the responsibilities of Town Conservation Boards. The inventory becomes an "Open Space Index" upon acceptance and approval by the Town Board. This document updates the Town's existing Open Space Index.

"Open area" is defined in the NYS ECL Sec. 239-y as:

> any area characterized by natural scenic beauty or, whose existing openness, natural condition or present state of use, if preserved, would enhance the present or potential value of abutting or surrounding development or would establish a desirable pattern of development or would offer substantial conformance with the planning objectives of the municipality or would maintain or enhance the conservation of natural or scenic resources.

For the purpose of this Open Space Index, "open space" is based on actual land cover, observed from aerial photographs and in the field. The types of "open space" include:

- Rivers
- Forests
- Wetlands
- Cultivated agricultural land
- Old fields and brushland
- Parks
- Active and former mines

Approximately 15,743 acres in the Town, comprising 71% of the Town's land area, is Open Space. For additional information on Open Space in the Town of Victor, reference Volume 1, Section 7.

Methodology

The primary source of data for the Open Space Index is the Land Cover Analysis provided by the Ontario County Planning Department, based on mapping/ground truthing conducted by Dr. Bruce Gilman of the Finger Lakes Community College. This mapping effort classified each of the land cover types found in the Town of Victor based on the system described in the publication, "Ecological Communities of New York", 2nd Edition, 2002, published by the NYS Department of Environmental Conservation's Natural Heritage Program.

The classification system assigns a ranking to each land cover type to designated whether it is "secure," "vulnerable" or "rare," globally and in New York State. (See Appendix A for references.)

The Conservation Board identified those land cover types that comprise Open Space and grouped them into three categories:

- Natural Resources
- Agricultural Resources
- Cultural Resources.

In general, the land cover types included in this Open Space Index are consistent with the definition of Open Space in the draft 2014 Town of Victor Comprehensive Plan:

> Undeveloped land which consists of natural features and topography (including ponds and streams, rocky areas, and vegetated areas, etc.) that may include Natural Resources, Landscaping, re-vegetated areas (such as agriculture and meadows) and pervious or open water areas within Recreational facilities. Open Space shall not include impervious area such as parking lots, paved sidewalks or buildings. In all instances, Open space shall maintain or enhance the rural character of the Town of Victor by conserving natural and/or scenic resources.[1]

However, many of the areas mapped as natural and agricultural open space include portions of impervious streets and sidewalks and some areas designated "Outdoor Recreation" include small areas of impervious tennis and basketball courts. Future study will be needed to delineate more accurately the extent of impervious surfaces in the Town.

To document the types and extent of open space in individual parcels, LaBella Associates prepared a parcel base map utilizing tax parcel data provided by the Ontario County Department of Planning. The Conservation Board designated categories of land cover types for the purpose of the calculations. For each parcel five acres or larger, LaBella Associates utilized Esri's ArcGIS "Clip" tool to calculate the number of acres of each type of open space contained in the parcel. A printed table that lists all of the parcels with open space resources is provided in Appendix C. For each parcel that contains open space, this table indicates the acreage of each type of open space within the parcel.

[1] Draft Victor Comprehensive Plan - 2013, Open Space and Growth Management chapter, page 16

Contents of Open Space Index

In addition to this narrative report, the Town of Victor Open Space Index includes:

- A set of three maps that document the categories of land cover classification that comprise the Town's Open Space:
    - Natural Resources
    - Agricultural Resources
    - Cultural Resources
- A map that depicts the agricultural soil classification of land is actively cultivated for agriculture and open land that has the potential to be returned to agricultural use. The soil classifications are:
    - Prime
    - Prime if drained
    - Soils of statewide importance
    - Other soils
- A map that depicts land that is subject to regulation or protected through public ownership or a permanent conservation easement
- An electronic database in Excel format that documents the extent of various categories of open space in each parcel (at least 5 acres in size.) This information is intended to assist the Conservation Board in reviewing proposals for development and conservation and to assist in prioritizing resources for acquisition, purchase of development rights or other conservation approaches.
- An interactive electronic map created with ESRI's ArcGIS Publisher that depicts each land cover polygon as well as open space data by parcel.

The Appendices to this narrative report include:

- Narrative description of each land cover classification (Appendix A)
- Tabular summary of the types of land covers and categories, and the total acres in each land cover type. (Appendix B.)

Open Space Resources

For the purpose of this Open Space Index, "Open Space" is defined based on land cover type as classified in "Ecological Communities of New York State." The land cover types that are designated as "Open Space" are categorized as natural, agricultural and cultural resources. The Open Space Index groups Open Space resources into three categories:

- Natural Resources
- Agricultural Resources and
- Cultural Resources.

The following narrative summarizes the ecological communities that comprise Open Space in Victor. (See also the narrative descriptions in Appendix A and the tabular summary in Appendix B.)

Natural Resources

Natural Resources include:

- Rivers
- Lakes and ponds
- Wetlands
- Woodlands

The land cover classifications included in each category are summarized below. Appendix A includes a more detailed description of each classification, excerpted from "Ecological Communities of New York State," 2nd Edition, 2002.

Rivers

The rivers that are wide enough to be categorized as **Confined River** (35 acres) are located within Irondequoit Creek and Ganargua Creek. (The other streams in the town are part of other land cover categories.)

Lakes and Ponds

A total of 40 natural **eutrophic ponds** (38 acres), which have not been substantially modified by human activity, are located in the Town. In addition, 139 **farm or other artificial ponds** (114 acres), which are either constructed or substantially modified, are located throughout the town.

Wetlands

Wetland communities classified as "open mineral soil wetlands," "forested mineral soil wetlands," and "forested peatlands."

"Open mineral soil wetlands" have less than 50% canopy of trees. The vegetation may be predominantly shrubs or herbs. The water levels fluctuate enough to allow plant litter to decompose, so there is little or no accumulation of peat. Land covers in this category found in the town include:

- **Deep emergent marsh** (160 acres) – characterized by standing water year round which may fluctuate in depth from 6 inches to six feet in depth as well as emergent (e.g., cattails), floating (e.g., water lily) and submerged (e.g., pondweeds) aquatic plants

- **Shallow emergent marsh** (75 acres) – a marsh meadow that is permanently saturated and seasonally flooded, better drained than the deep emergent marsh, and typically found along streams and shrub swamps as part of a complex mosaic in a large wetlands.

- **Shrub swamp** (43 acres) – typically found along a shore of a lake or river or in a wet depression, may be dominated by alder, dogwood or willows.

"Forested mineral soil wetlands" include seasonally flooded forests and permanently flooded or saturated swamps that have at least 50% canopy of trees. These wetlands are considered vulnerable ecological communities in New York State. In Victor, they include:

- **Floodplain forest** (273 acres) – a hardwood forest along river floodplains and deltas that flood periodically, with varied vegetation that may include silver maple, ash and cottonwood.

- **Silver maple – ash swamp** (406 acres) – a hardwood basin swamp characterized by wet conditions with minimal seasonal variation.

- **Hemlock-hardwood swamp** (27 acres) – occurs in deep muck in wet depressions, characterized by 70% - 90% tree canopy (typically hemlock, yellow birch, and red maple), sparse shrub layer and low species diversity.

"Forested peatlands" have at least 50% canopy of trees growing in peat, marl and muck. often spring fed or enriched by groundwater seepage with a stable water table and saturated soil that is often rich in calcium. These wetlands are considered vulnerable ecological communities in New York State. Examples in Victor include:

- **Red maple – tamarack peat swamp** (12 acres) – Red maple and tamarack form an open canopy (50-70% cover) with numerous small openings dominated by shrubs or sedges.

- **Northern white cedar swamp** (55 acres) – more than 30% of the canopy cover is northern white cedar and the shrub layer is usually sparse.

Woodlands

Upland communities with more than 60% canopy cover of trees include the Appalachian oak-hickory forest and the successional northern hardwoods and successional southern hardwoods communities. Examples in the Town include:

- **Appalachian oak-hickory forest** (726 acres) - occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes, dominated by oak and hickory trees.

- **Successional northern** (4,318 acres) **and southern** (654 acres) **hardwoods -** a hardwood or mixed forest that occurs on sites that have been cleared or otherwise disturbed. Northern hardwoods typically include aspen, birch and cherry trees; southern hardwoods include elm, ash and red maple.

Agricultural Resources

Agricultural Resources include actively cultivated lands as well as former farmland and old fields that have grown into shrubs.

Actively cultivated land includes:

- **Cropland** (3,339 acres) – includes agricultural land planted in row crops and field crops, as well as hayfields that are rotated to pasture.

- **Pastureland** (388 acres) – agricultural land permanently maintained (or recently abandoned) as pasture area for livestock

- **Conifer plantation** (311 acres) - a stand of softwoods planted for the cultivation and harvest of timber products, or to provide wildlife habitat, soil erosion control, windbreaks, or landscaping. These plantations may consist of a single type of tree or several species, but excludes stands in which pine, spruce, or fir are dominant.

- **Orchard** (76 acres) - a stand of cultivated fruit trees, often with grasses as a groundcover, which may be currently under cultivation or recently abandoned.

- **Flower/ Herb garden** (74 acres)- residential, commercial, or horticultural land cultivated for the production of ornamental herbs and shrubs.

Agricultural Resources also include open uplands that are no longer farmed but have the potential to be returned to active cultivation. These include:

- **Successional old fields** (2,138 acres) - a meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned.

- **Successional shrublands** (1,240 acres) – a shrubland that occurs on sites that have been cleared (for farming, logging, development, etc.) or otherwise disturbed, and contains at least 50% cover of shrubs.

Cultural Resources

Cultural Resources that are considered to be Open Space include land used for outdoor recreation as well as current and former sand and gravel mines:

- **Outdoor Recreation** (950 acres) - includes public parks, athletic fields and tennis courts.

- **Sand mine** (4 acres) - an excavation in a sand deposit or sand dune from which sand has been removed. Vegetation is usually sparse.

- **Gravel mines** (269 acres) - an excavation in a gravel deposit from which gravel has been removed. Often these are dug into glacial deposits such as eskers or kames. Vegetation may be sparse if the mine is active; there may be substantial vegetative cover if the mine has been inactive for several years.

Appendix A includes the description of each land cover category, excerpted from Ecological Communities of New York State, summarizes the number of acres in each category within the Town of Victor, and notes which communities are considered rare or vulnerable in New York State.

Appendix B presents a more detailed tabular summary of the land cover classifications that are included in the acreage calculations for each category of land use (Natural, Agricultural, and Cultural.)

Additional Resource Maps

Two additional maps serve as companions to the Town's Open Space maps of Natural Resources, Agricultural Resources and Cultural Resources:

- Protected/Regulated Land

- Existing and Potential Agricultural Land by Agricultural Soils Classification

<u>Protected/ Regulated Land</u>

The map of land areas that are protected or may be subject to regulation by State or Federal agencies serves as a companion to the three maps of Open Space derived from land cover data. The following features are depicted on this map:

- Wetlands mapped by the NYS Department of Environmental Conservation
- Wetlands mapped as part of the National Wetlands Inventory, which offer a guide to areas that may be subject to wetlands regulations administered by the U.S. Army Corps of Engineers

- Streams classified by the NYS Department of Environmental Conservation
- Public parks
- Privately owned conservation land
- Land protected through a conservation easement held by the Town.

Agricultural Soils Capability

The Agricultural Soils map supplements the Agricultural Resources map by identifying the soil capabilities of those lands that are currently cultivated (cropland, pasture, orchard, garden) and those that have the potential to be returned to farming use (successional old fields and shrubland.)

As a companion to the Agricultural Resources map, the Open Space Index includes a map that depicts the agricultural soils classification of existing and potential agricultural land.

Parcel Database

For each parcel of five acres or larger[2], the electronic database in Excel format indicates how many acres are in the following categories of Open Space:

Natural	**Agricultural**	**Cultural**
Open Water	Cultivated farmland	Outdoor Recreation
Open Wetlands	Conifer plantation	Sand/ Gravel mines
Forested Wetlands/Peatlands	Orchard/Flower-Herb Garden	
Forested Uplands (mature)	Open Uplands – old fields/ shrubland	
Forested Uplands (successional)/Open Uplands (transitional)		

The interactive maps created with ArcGIS Publisher include:

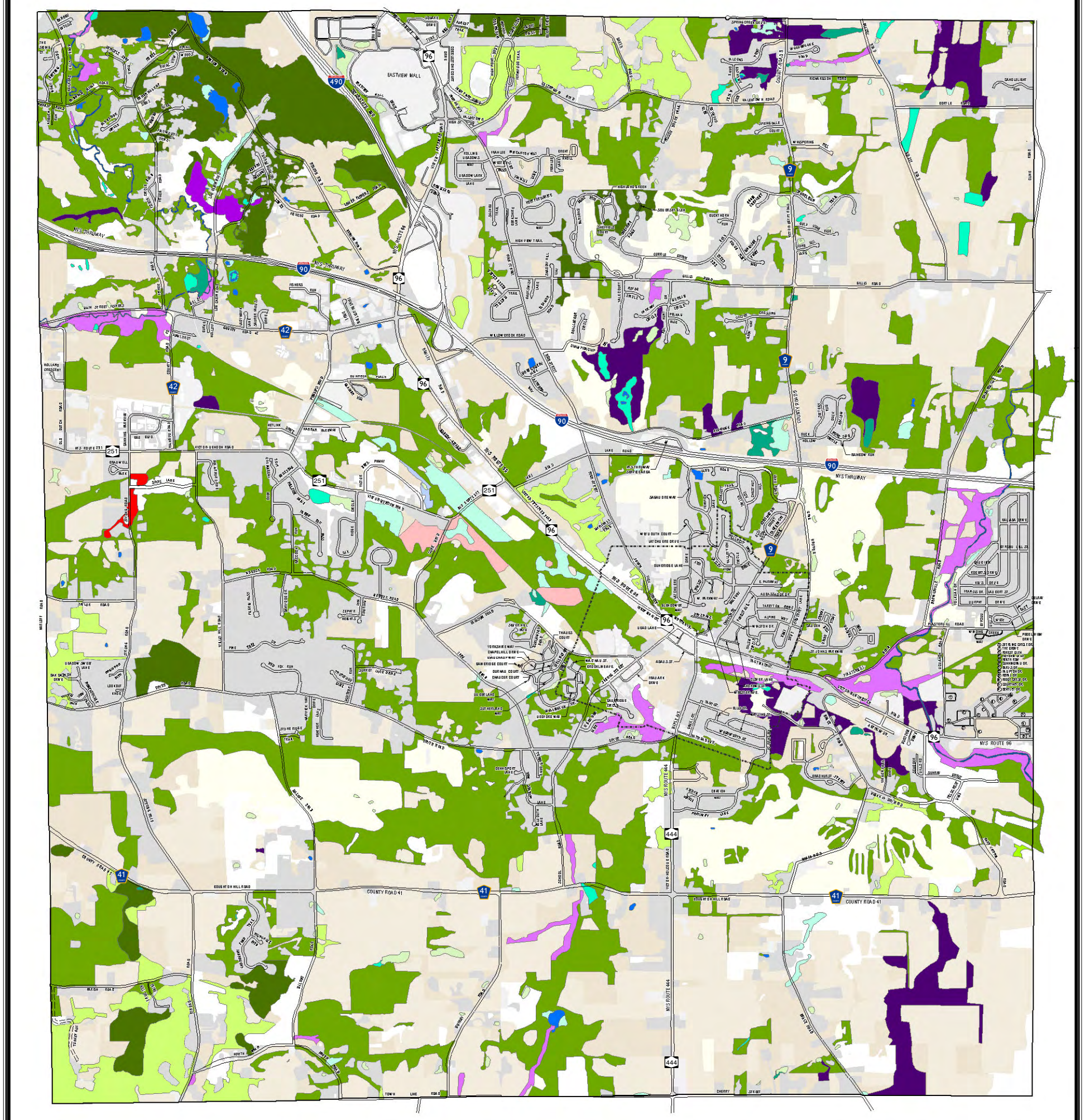
- Each of the townwide land cover maps that depicts each category of open space
- A parcel-based map with data attached to each parcel (>5 acres) that indicate the extent of open space, of each type, contained within the parcel. This tool is intended to facilitate the evaluation of parcels that may be proposed for development, acquisition or preservation. The parcel-based map is based on 2013 tax parcel data.

These maps are intended to be used by the Conservation Board to identify the land cover types and protected/ regulated land throughout the Town and to document the resources included in each individual parcel (> 5 acres in size).

[2] Based on 2013 tax parcel data

OPEN SPACE INDEX
Natural Resources

town of VICTOR NEW YORK



Natural Resources - Land Cover Classifcations

Palustrine System

ForestedPeatlands

- Northern White Cedar Swamp*
- Red Maple-Tamarack Peat Swamp*

Forested Mineral Soil Wetlands

- Floodplain Forest
- Hemlock-Hardwood Swamp*
- Silver Maple-Ash Swamp*

Open Mineral Soil Wetlands

- Deep Emergent Marsh
- Shallow Emergent Marsh
- Shrub Swamp

Terrestrial System

Forested Uplands

- Appalachian Oak-Hickory Forest
- Successional Northern Hardwoods
- Succesional Northern Hardwoods (degraded)
- Successional Southern Hardwoods

Riverine/ Lacustrine System

- Confined River
- Eutrophic Pond
- Farm Pond/ Artificial Pond

*** Vulnerable ecological community in New York State**

Other Land Cover Classifcations

- Agricultural Land Covers
- Other Cultural Open Space
- Not Open Space
- No Data (white without outline)

SOURCE: Land Cover mapping by Ontario County Planning Department and Dr. Bruce Gilman, 2013; Classifications based on, "Ecological Communities of New York State," 2nd Edition, 2002, published by NYS Department of Environmental Conservation Natural Heritage Program.

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N W E S

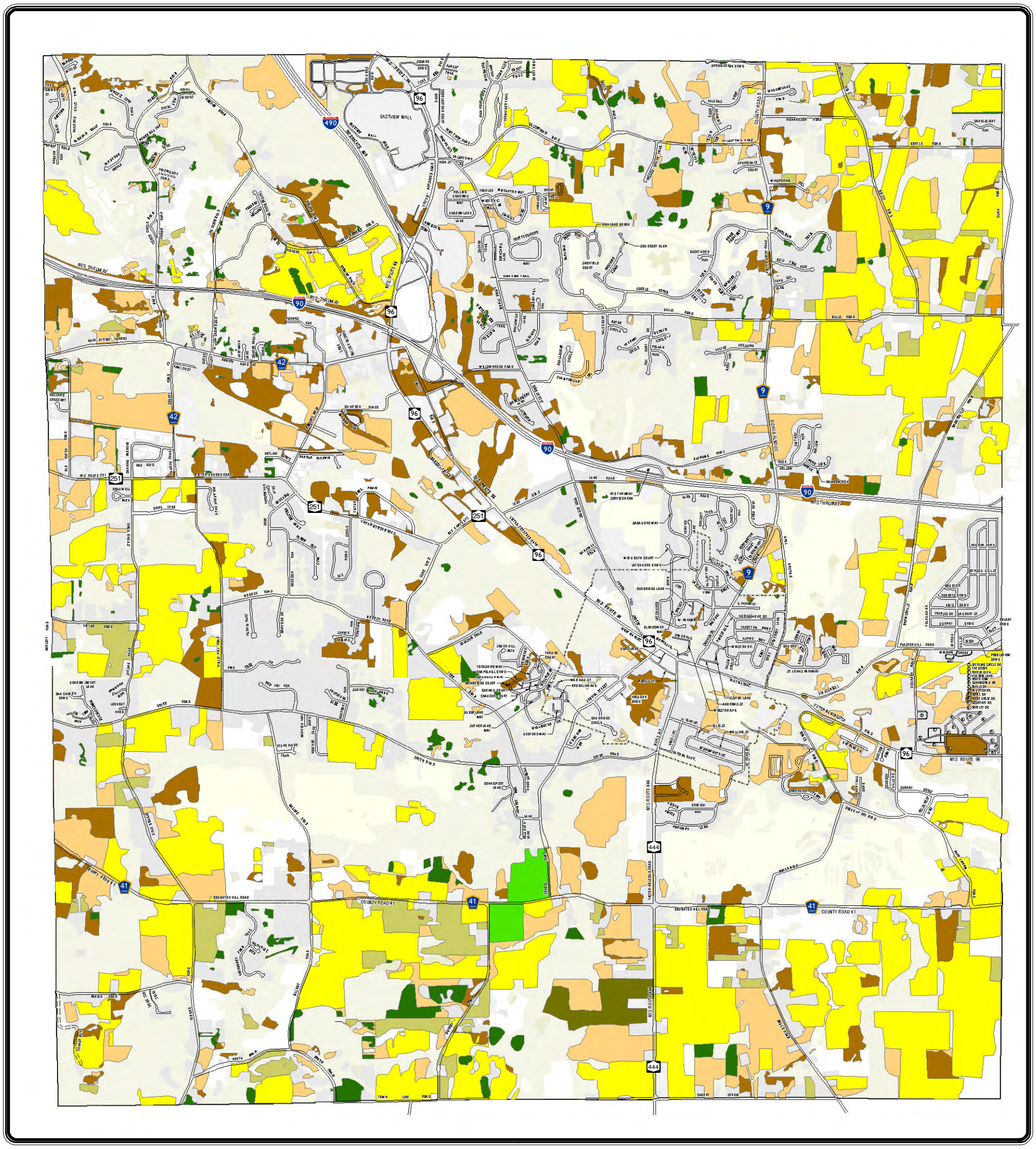
September 2013

LABELLA Associates, D.P.C. Engineering Architecture Environmental Planning

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OPEN SPACE INDEX
Agricultural Resources

town of VICTOR NEW YORK



Agricultural Resources - Land Cover Classifcations

Agricultural/ Cultivated Land

- Cropland
- Orchard
- Pasture
- Conifer Plantation
- Flower/ Herb Garden

Open Uplands

- Succesional Old Field
- Succesional Old Field/ Conifer Plantation
- Succesional Shrubland

Other Land Cover Classifications

- Natural Resources Land Covers
- Other Cultural Resources
- Not Open Space
- No Data (white no outline)

0 0.5 1 Miles

N W E S

SOURCE: Land Cover mapping by Ontario County Planning Department and Dr. Bruce Gilman, 2013; Classifications based on, "Ecological Communities of New York State," 2nd Edition, 2002, published by NYS Department of Environmental Conservation Natural Heritage Program.

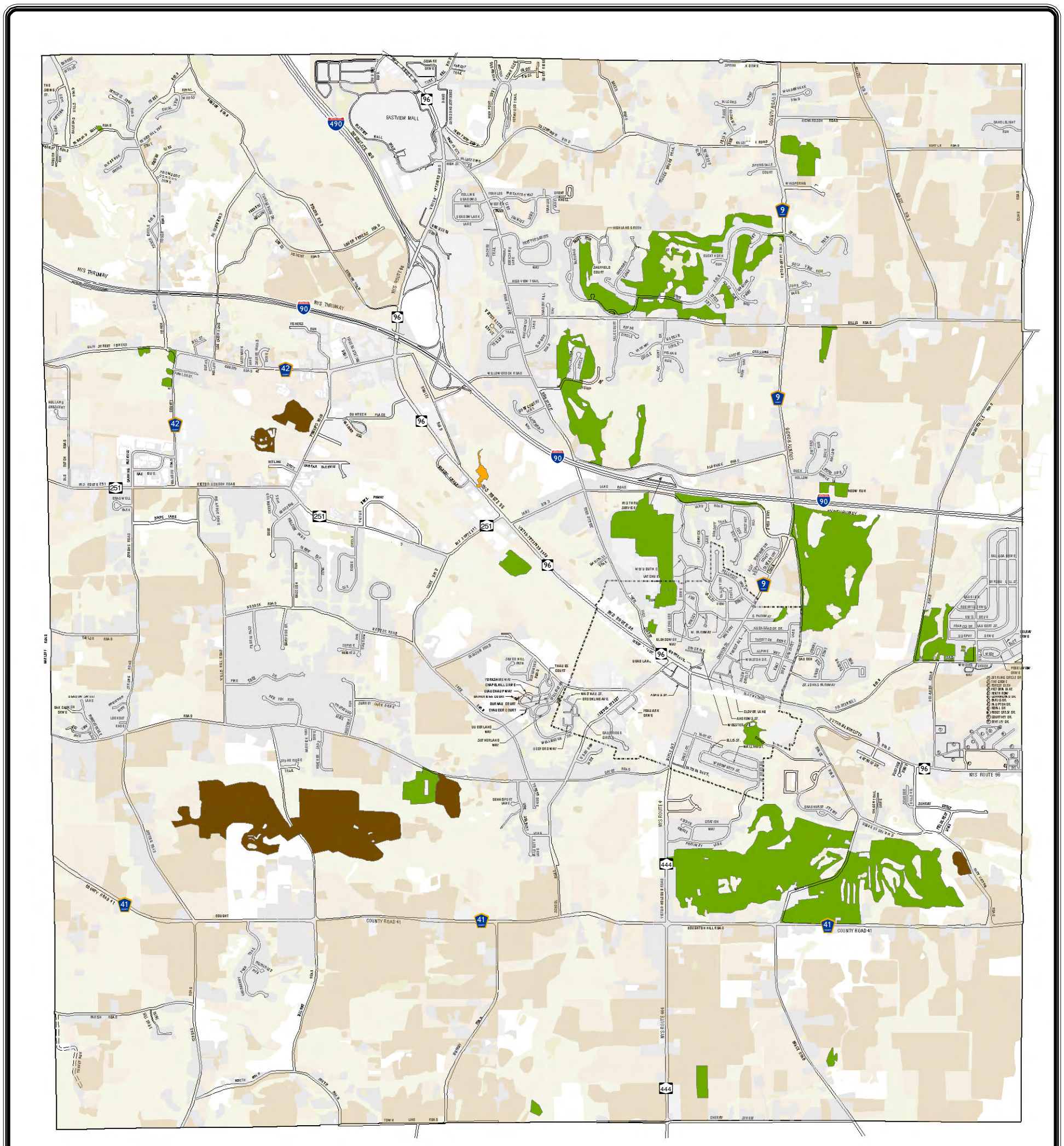
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August 2013

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OPEN SPACE INDEX
Cultural Resources

town of VICTOR NEW YORK



Cultural Resources - Land Cover Classifcations

Cultural Open Space

- Gravel Mine
- Sand Mine
- Outdoor Recreation

Other Land Cover Types

- Natural Resources
- Agricultural Resources
- Not Open Space
- No Data (white without outline)

0 0.5 1 Miles

N W E S

SOURCE: Land Cover mapping by Ontario County Planning Department and Dr. Bruce Gilman, 2013; Classifications based on, "Ecological Communities of New York State," 2nd Edition, 2002, published by NYS Department of Environmental Conservation Natural Heritage Program.

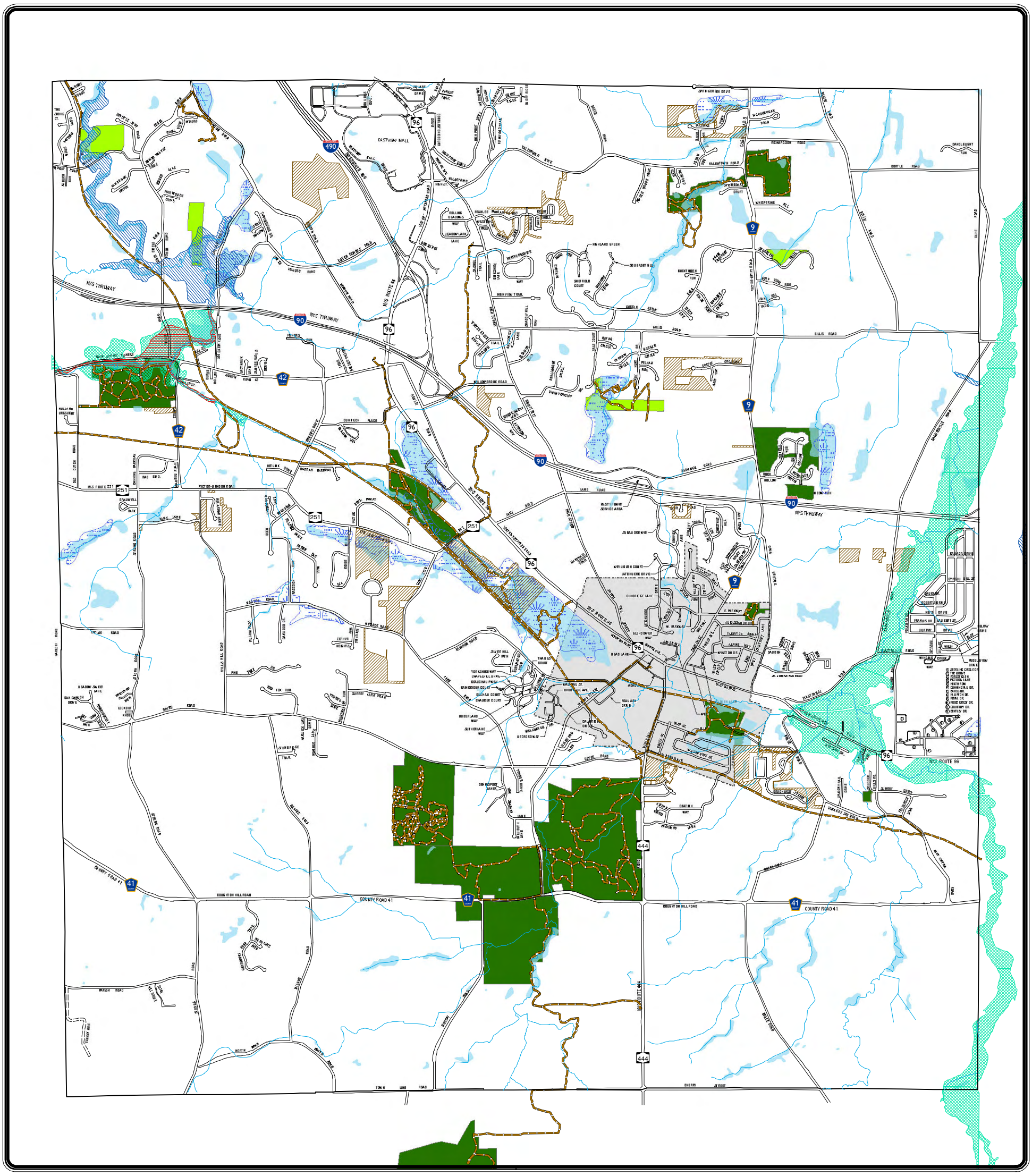
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August 2013

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OPEN SPACE INDEX
Protected/ Regulated Land

town of VICTOR NEW YORK



Environmental Features Potentially Subject to Regulation

- NYS DEC Wetlands
- DEC Classified Streams
- NWI Wetlands

Flood Hazard Areas

- Zone A
- Zone AE
- Floodway

Parks and Conservation Lands

- Conservation Easements
- Public Park
- Private Conservation Land
- Hiking and Biking Trails

0 0.5 1 Miles

N W E S

SOURCE: Shapefiles provided by Ontario County Department of Planning

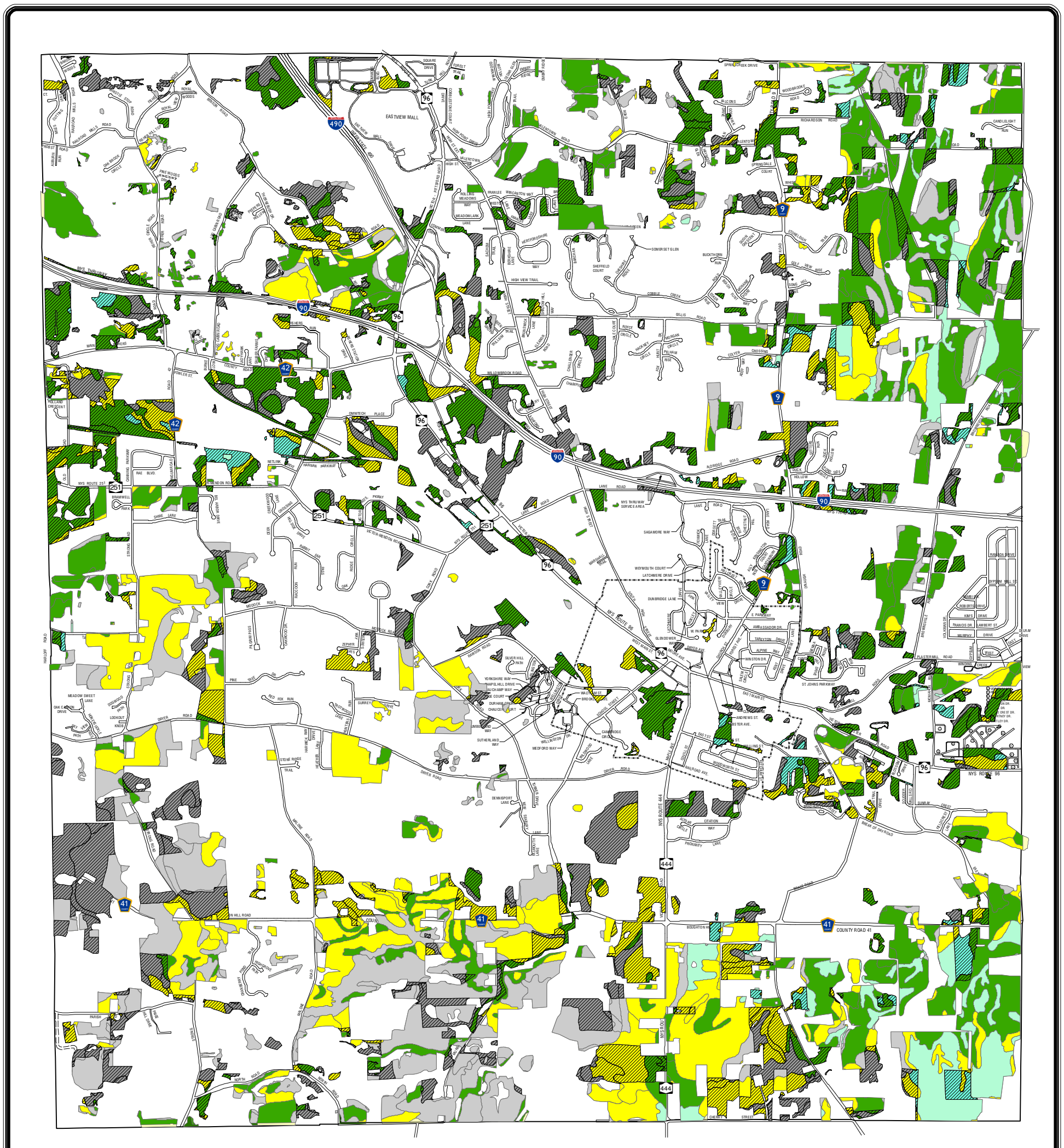
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OPEN SPACE INDEX
Agricultural Resources
by Agricultural Soils Classification

town of VICTOR NEW YORK



Agricultural/ Cultivated Land
by Agricultural Soils Classification

- Prime
- Statewide Importance
- Prime if Drained
- Other Soils
- Successional old field and shrubs - Not currently farmed

SOURCE: Land Cover mapping by Ontario County Planning Department and Dr. Bruce Gilman, 2013;
Classifications based on, "Ecological Communities of New York State," 2nd Edition, 2002, published by NYS Department of Environmental Conservation Natural Heritage Program.
Soils boundaries and classifications by USDA Natural Resources Conservation Service.

0 0.5 1 Miles

N W E S

LABELLA Associates, D.P.C.

September 2013

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III. RIVERINE SYSTEM

The riverine system consists of linear aquatic communities of flowing, non-tidal waters with a discrete channel, with persistent emergent vegetation sparse or lacking, but may include areas with abundant submerged or floating-leaved aquatic vegetation. The riverine communities in this classification are distinguished primarily by position of the stream in the watershed and water flow characteristics.

These communities are broadly defined, and may include two or more finer scale habitats (i.e., "microhabitats"), such as *riffles* (which include waterfalls), *runs*, and *pools;* these habitats usually have distinctive species assemblages (i.e., "associations"). A *riffle* is a part of the stream that is shallow and has a comparatively fast current; the water surface is disturbed by the current and may form standing waves (i.e., it is "turbulent"). A *run* is a part of the stream that has a moderate to fast current; the water is deep enough that the water surface is smooth and unbroken by the water current (although it may be disturbed by wind). A *pool* is a part of the stream that is deep and has a comparatively slow current; the water surface is calm unless disturbed by wind.

The riverine communities are also distinguished by size of the stream. Large streams have an average width greater than about 30 m (100 ft), medium streams are from about 3 to 30 m (10 ft to 100 ft) wide, and small streams have an average width less than about 3 m (10 ft).

This classification of riverine communities is based on a combination of NYNHP field surveys, literature review and discussions with aquatic ecologists. Although the Heritage program has focused inventory work on streams since 1995; we do not currently have sufficient field data for confidently undertaking any major restructuring of the 1990 riverine classification.

However, field work has suggested that this classification works well for representing the coarse scale distinctions between both abiotic and biotic features of river types. Although physically based, it is meant to serve as a coarse filter emphasing resident stream biota. Two new coarse-scale physical-based types have been added to the classification, segregated out from other more broadly defined types of the 1990 classification: spring and deepwater river, the former a very small perennial stream, the latter a very large stream with profundal areas.

Further refinement of the riverine classification to distinguish regional variants will likely be based on additional field surveys and analysis of existing data collected by various aquatic scientists and agencies statewide. Regional variation in many of the designated riverine communities is evident, but we do not currently have enough information or have undertaken analyses to confidently split common and widespread stream types into more specific regional variants. A finer scale classification of streams that distinguishes types according to ecoregion and/or watershed is being evaluated. Preliminary conclusions suggest that vascular plant, bryophyte, algae, fish, mollusk, insect and plankton assemblages may follow different distribution patterns, some more closely correlated with ecoregion boundaries, some more closely with major ecological drainage units. The fish and mollusk assemblages in the riverine communities (especially in unconfined rivers and deepwater rivers) generally vary according to the watershed.

A. NATURAL STREAMS

This subsystem includes streams in which the stream flow, morphometry, and water chemistry have not been substantially modified by human activities, or the native biota are dominant. The biota may include some introduced species (for example, stocked or accidentally introduced fishes), however the introduced species are not usually dominant in the stream community as a whole.

3. Confined river: the aquatic community of relatively large, fast flowing sections of streams with a moderate to gentle gradient. The name of this community has been changed from "midreach stream" to better reflect the concept. These streams have well-defined pattern of alternating pools, riffles, and runs. Confined rivers usually have poorly defined meanders (i.e., low sinuosity), occur in confined valleys and are most typical of the midreaches of stream systems. These streams are typically of moderate depth, width and low flow discharge and usually represent a network of 3rd to 4th order stream segments. Most of the erosion is lateral, creating braids, channel islands, and bars, and deposition is moderate with a mix of coarse rocky to sandy substrate. Waterfalls are typically present; these are here treated as features of the more broadly defined community. The predominant source of energy is generated in the stream (these are autochtonous streams). These streams have high water clarity and are well oxygenated. They are typically surrounded by open upland riverside communities including riverside sand/gravel bar, cobble shore or one of the shoreline outcrop communities.

Approximately 34.8 acres of **confined** river are located within Irondequoit Creek and Ganargua Creek.

Species assemblages characteristic of riffles and rocky bottoms dominate the community. Fish diversity is typically high to moderate. Characteristic fishes include creek chub (*Semotilus atromaculatus*), pumpkinseed (*Lepomis gibbosus*), common shiner (*Luxilus cornutus*), and trout-perch (*Percopsis omiscomaycus*) in pools; rosyface shiner (*Notropis rubellus*) at the head of pools; tessellated darter (*Etheostoma olmstedi*), longnose dace (*Rhinichthys cataractae*), slimy sculpin (*Cottus cognatus*) or mottled sculpin (*C. bairdi*), and stonecat (*Noturus flavus*) in riffles; and bluntnose minnow (*Pimephales notatus*) and northern hogsucker (*Hypentelium nigricans*) in runs. Other characteristic fishes may include blacknose dace (*Rhinicthys atratulus*) and fantail darter (*Etheostoma flabellare*). Common introductions are rainbow trout (*Salmo gairdneri*), brown trout (*S. trutta*), and (in streams where it is not native) smallmouth bass (*Micropterus dolomieui*).

Characteristic mollusks include eastern elliptio (*Elliptio complanta*), eastern floater (*Pyganodon cataracta*), fingernail clams (*Sphaerium* spp.). Other macroinvertebrates are diverse; characteristic macroinvertebrates include riffle and rocky bottom specialists as well as algae shredders such as crayfish (Cambaridae), mayflies (Ephemeroptera including Ephemeridae, Heptageniidae, *Isonychia* sp.), stoneflies (Plecoptera including Chloroperlidae, *Acroneuria* sp., *Neoperla* sp.), caddisflies (Trichoptera including Hydropsychidae, *Helicopsyche* sp., *Dolophilodes* sp., *Rhyacophila* sp.), cranefly (*Hexatoma* sp.), beetles (*Oulimnius* sp., *Psephenus* sp.), dobsonflies (Corydalidae), midge (*Polypedilum* sp.), craneflies (Tipulidae), and blackflies (Simulidae). Odonate (Odonata including Calopteryidae) larvae may be characteristic of runs. True bugs (Gerridae, Vellidae, Mesovellidae) are characteristic of pools).

Epilithic algae are the predominate plant. Aquatic macrophytes are usually sparse; typical aquatic macrophytes include waterweed (*Elodea canadensis*) and linear-leaved pondweeds such as sago pondweed (*Potamogeton pectinatus*). An additional characteristic vascular plant may be *Podostemum ceratophyllum*. Bryophytes are often confined to shallows and the intermittently exposed channel perimeter. Four to six variants associated with a combination of ecoregions (including Northern Appalachian, Great Lakes, Lower New England and Alleghany Plateau ecoregions) or major watersheds (including Great Lakes, Hudson River, Alleghany River,

Species characteristic of Alleghany Plateau and Great Lakes streams may include the fishes greenside darter (*E. blennioides*) and rainbow darter (*Etheostoma caeruleum*), central stoneroller (*Campostoma anomalum*), silverjaw minnow (*Ericymba buccata*), spotted darter (*Etheostoma maculatum*), golden redhorse (*Moxostoma erythrurum*) and shorthead redhorse (*M. macrolepidotum*); the mollusks mucket (*Actinonaias ligmentina*), Ohio pigtoe (*Pleurobema cordatum*), kidneyshell (*Ptychobranchus fasciolaris*), fluted-shell (*Lasmigona costata*), lampmussels (*Lampsilis fasciola, L. ventricosa*), and spike (*Elliptio dilitata*); and the other macroinvertebrates mayfly (*Stenonema* spp.), and caddisfly (*Cheumatopsyche* sp.).

Distribution: throughout New York State.

Rank: G4 S4 *Revised:* 2001

IV. LACUSTRINE SYSTEM

The lacustrine system consists of ponded waters situated in topographic depressions or dammed river channels, with persistent emergent vegetation sparse or lacking, but including any areas with abundant submerged or floating-leaved aquatic vegetation. The lacustrine communities in this classification are distinguished primarily by trophic state, alkalinity, annual cycles of thermal stratification, circulation, morphometry (size and shape of the lake basin and drainage area; water permanence), and water chemistry (including salinity).

The communities are described in terms of the free-floating organisms of the open water, or the limnetic or pelagic zone (including plankton and fish), the aquatic macrophytes and fish near the shore or littoral zone, and the bottom-dwelling organisms or benthos. The limnetic (pelagic) zone may be divided into the epilimnion (upper lake zone), which is sunny mixed by the wind, and comparatively rich in oxygen, and the hypolimnion (lower lake zone), which is darker, and comparatively rich in carbon dioxide from respiration and decay. The transition between the epilimnion and hypolimnion is called the thermocline (or the metalimnion). The lake bottom or benthic zone may be divided into the peripheral, well-lit shallows or littoral zone, the slightly deeper and darker sublittoral zone, and (in summer-stratified lakes) the deep, cold region where currents are minimal and light is much reduced, called the profundal zone. Benthic zones may each have a distinctive resident biota; however, many of the plankton and fish move between pelagic zones on a regular basis. Deep lakes have an average depth greater than about 60 m (200 ft), moderately deep lakes are from about 6 to 60 m (20 ft to 200 ft) deep, and shallow lakes have an average depth less than about 6 (20 ft). Large lakes are greater than about 80 ha (200 acres) and small lakes are less than this size.

This classification of lacustrine communities is based on a combination of NYNHP field surveys, literature review, and discussions with aquatic scientists. To date about 42 plots have been sampled statewide by NYNHP in lacustrine communities. Although the Heritage Program has focused inventory work on lakes since 1995; we do not currently have sufficient field data for confidently undertaking any major restructuring of the 1990 lacustrine classification. However, field work has suggested that this classification works well for representing the coarsest scale distinctions between both biotic and abiotic features of lacustrine community types. The classification is intended to represent entire lake "macrohabitats." Although physically based, it is meant to serve as a coarse filter emphasizing resident lake biota. It is recognized that lakes may contain numerous pelagic and benthic associations and that there is often much overlap in association distribution across lake macrohabitat types. For now, NYNHP is maintaining this macrohabitat classification while evaluating the utility and feasibility of replacing or supplementing this classification with an association classification. Further evaluation of the macrohabitat classification is underway to compare trophic state versus alkalinity as a factor more important in driving the distribution of biota and more resistent to human alteration of water chemistry. Tentatively, it is thought that alkalinity is a stronger driving force, thus suggesting a switch of the 1990 classification of common pond types from oligotrophic and eutrophic to acidic and alkaline, and common dimictic lake types from oligotrophic, mesotrophic, and eutrophic to acidic and alkaline, perhaps with trophic state as a secondary modifier.

Lastly, addition of three "intermittent pond" types to the 1990 classification is also recommended: vernal pool and pine barrens vernal pond (both previously treated under the palustrine system) and sinkhole pond (split from sinkhole wetland in the palustrine system). Other types under evaluation include "flow-through" or "fluvial pond," a potential split from

the currently recognized oligotrophic pond and eutrophic pond, closely associated with riverine complexes rather than in the typical isolated basin setting.

Further refinement of the lacustrine classification to distinguish regional variants will likely be based on additional field surveys and analysis of data collected by various aquatic scientists and agencies statewide. Regional variation in many of the designated lacustrine communities is evident, but we do not currently have in our files enough information or have undertaken analyses to confidently split common and widespread lake types into more specific regional variants. A finer scale classification of lakes that distinguishes types according to ecoregion and/or watershed is being evaluated. Preliminary conclusions suggest that vascular plant, bryophyte, algae, fish, mollusk, insect, and plankton assemblages may follow different distribution patterns, some more closely correlated with ecoregion boundaries, some more closely with major ecological drainage units.

A. NATURAL LAKES AND PONDS

This subsystem includes the Great Lakes, and inland lakes and ponds in which the trophic state, morphometry, and water chemistry have not been substantially modified by human activities, or the native biota are dominant. The biota may include someintroduced species (for example, non-native macrophytes, stock or accidentally introduced fishes), however the introduced species are not usually dominant in the lake or pond community as a whole.

16. Eutrophic pond: the aquatic community of a small, shallow, nutrient-rich pond. The water is usually green with algae, and the bottom is mucky. Eutrophic ponds are too shallow to remain stratified throughout the summer; they are winter-stratified, monomictic ponds. Additional characteristic features of a eutrophic pond include the following: water that is murky, with low transparency (Secchi disk depths typically less than 4 m); water rich in plant nutrients (especially high in phosphorus, nitrogen, and calcium), high primary productivity (inorganic carbon fixed = 75 to 250 g/m2/yr);, and a weedy shoreline. Alkalinity is typically high (greater than 12.5 mg/l calcium carbonate). A name change, and slight conceptual change to alkaline pond is being evaluated.

A total of 40 eutrophic ponds occupy approximately 38 acres. The largest is 7 acres; 24 are less than 1/2 acre.

Species diversity is typically high. Aquatic vegetation is abundant. Littoral, and epilimnion species assemblages usually predominate. Characteristic plants include coontail (*Ceratophyllum demersum*), duckweeds (*Lemna minor, L. trisulca*), waterweed (*Elodea canadensis*), pondweeds (*Potamogeton* spp.), water starwort (*Heteranthera dubia*), bladderworts (*Utricularia* spp.), naiad (*Najas flexilis*), tapegrass (*Vallisneria americana*), algae (*Cladophora* spp.) yellow pond-lily (*Nuphar luteum*), and white water-lily (*Nymphaea odorata*). Characteristic fishes are usually warmwater fishes. Characteristic macroinvertebrates may include several types of odonates (*Aeshna* spp., *Ischnura* spp., *Gomphus* spp., and *Basiaeschna* spp.), and leeches (Hirundinae). Characteristic, and dominant plankton may include the phytoplankton *Chrysosphaerella longispina*, and *Ceratium* spp., and the zooplankton *Nauplii*, rotifers such as *Keratella,* cyclopoids, and cladocerans.

Three to seven ecoregional variants (including Northern Appalachian, Great Lakes, Lower New England types) are suspected to differ in dominant, and characteristic vascular plants, fishes, mollusks, and insects. Flow-through or fluvial pond might be a distinct variant worthy of recognition as a separate community type, but needs further evaluation. Flowthrough ponds are closely associated with riverine complexes (e.g., large natural widenings of rivers or large beaver impoundments of river channels), and have a high flushing rate. Characteristic animals of flow-through ponds may include beaver (*Castor canadensis*). More data on this community are needed.

Distribution: throughout New York State, and is more common at low elevations, especially in the Great Lakes Plain ecozone, and St. Lawrence River Valley.

Rank: G4 S4 *Revised:* 2001

Sources: Gilman 1979; NYNHP field surveys.

B. LACUSTRINE CULTURAL

This subsystem includes communities that are either created, and maintained by human activities, or are modified by human influence to such a degree that the trophic state, morphometry, water chemistry, or biological composition of the resident community are substantially different from the character of the lake community as it existed prior to human influence.

4. Farm pond/artificial pond: the aquatic community of a small pond constructed on agricultural or residential property. These ponds are often eutrophic, and may be stocked with panfish such as bluegill (*Lepomis macrochirus*), and yellow perch (*Perca flavescens*). The biota are variable (within limits), reflecting the species that were naturally or artificially seeded, planted, or stocked in the pond.

The 139 farm ponds or other artificial ponds located throughout the town occupy approximately 108 acres in the town. The largest is 9 acres; 82 are smaller than ½ acre.

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

V. PALUSTRINE SYSTEM

The palustrine system consists of non-tidal, perennial wetlands characterized by emergent vegetation. The system includes wetlands permanently saturated by seepage, permanently flooded wetlands, and wetlands that are seasonally or intermittently flooded (these may be seasonally dry) if the vegetative cover is predominantly hydrophytic and soils are hydric. Wetland communities are distinguished by their plant composition (hydrophytes), substrate (hydric soils), and hydrologic regime (frequency of flooding) (Cowardin 1979).

Peatlands are a special type of wetland in which the substrate primarily consists of accumulated peat (partly decomposed plant material such as mosses, sedges, and shrubs) or marl (organically derived calcium carbonate deposits), with little or no mineral soil. Stable water levels or constant water seepage allow little aeration of the substrate in peatlands, slowing decomposition of plant litter, and resulting in peat or marl accumulation. In this classification, peatlands are characterized by their hydrologic regime; water source and water chemistry are important factors. Minerotrophic peatlands (fens) are fed by groundwater that contains minerals obtained during passage through or over mineral soils or aquifers. Ombrotrophic peatlands (bogs) are fed primarily by direct rainfall, with little or no groundwater influence (Damman and French 1987). The vegetation of ombrotrophic peatlands is depauperate; plants in the families *Sphagnaceae* and *Ericaceae* are prominent. The vegetation of minerotrophic peatlands is comparatively rich in species; plants in the families *Cyperaceae* and *Poaceae* are prominent (Heinselman 1970).

In a natural landscape there are continuous gradients from ombrotrophic to strongly minerotrophic wetlands; there are also continuous gradients in soils from mineral soils to peat

soils. The boundaries between different types of wetlands are not always discrete. Several different types of wetlands may occur together in a complex mosaic.

A. OPEN MINERAL SOIL WETLANDS

This subsystem includes wetlands with less than 50% canopy cover of trees. In this classification, a tree is defined as a woody plant usually having one principal stem or trunk, a definite crown shape, and characteristically reaching a mature height of at least 16 ft (5 m) (Driscoll et al. 1984). The dominant vegetation may include shrubs or herbs. Substrates range from mineral soils or bedrock to well-decomposed organic soils (muck). Fluctuating water levels allow enough aeration of the substrate to allow plant litter to decompose, so there is little or no accumulation of peat.

1. Deep emergent marsh: a marsh community that occurs on mineral soils or fine-grained organic soils (muck or well-decomposed peat); the substrate is flooded by waters that are not subject to violent wave action. Water depths can range from 6 in to 6.6 ft (15 cm to 2 m); water levels may fluctuate seasonally, but the substrate is rarely dry, and there is usually standing water in the fall.

Approximately 160 acres of **deep emergent marsh** are found at several sites throughout the town. The largest areas are located south of NYS Route 96 west of the Village of Victor.

The most abundant emergent aquatic plants are cattails (*Typha angustifolia, T. latifolia*), wild rice (*Zizania aquatica*), bur-weeds (*Sparganium eurycarpum, S. androcladum*), pickerel weed (*Pontederia cordata*), bulrushes (*Scirpus tabernaemontani, S. fluviatilis, S. heterochaetus., S. acutus, S. pungens, S. americanus*), arrowhead (*Sagittaria latifolia*), arrowleaf (*Peltandra virginica*), rice cutgrass (*Leersia oryzoides*), bayonet rush (*Juncus militaris*), water horsetail (*Equisetum fluviatile*) and bluejoint grass (*Calamagrostis canadensis*).

The most abundant floating-leaved aquatic plants are fragrant water lily (*Nymphaea odorata*), duckweeds (*Lemna minor, L. trisulca*), pondweeds (*Potamogeton natans, P. epihydrus, P. friesii, P. oakesianus, P. crispus, P. pusillus, P. zosteriformis, P. strictifolius*), spatterdock (*Nuphar variegata*), frog's-bit (*Hydrocharis morus-ranae*), watermeal (*Wolffia* spp.) water-shield (*Brasenia schreberi*), and water-chestnut (*Trapa natans*).

The most abundant submerged aquatic plants are pondweeds (*Potamogeton richardsonii, P. amplifolius, P. spirillus, P. crispus, P. zosteriformis*), coontail (*Ceratophyllum demersum*), chara (*Chara globularis*), water milfoils (*Myriophyllum spicatum, M. sibericum*), pipewort (*Eriocaulon aquaticum*), tapegrass (*Vallisneria americana*), liverwort (*Riccia fluitans*), naiad (*Najas flexilis*), water lobelia (*Lobelia dortmanna*), waterweed (*Elodea canadensis*), waterstargrass (*Heteranthera dubia*), and bladderworts (*Utricularia vulgaris, U. intermedia*).

Animals that may be found in deep emergent marshes include red-winged blackbird (*Agelaius phoeniceus*), marsh wren (*Cistothorus palustris*), bullfrog (*Rana catesbeiana*), and painted turtle (*Chrysemys picta*). Rare species in some deep emergent marshes include American bittern (*Botaurus lentiginosus*), Virginia rail (*Rallus limicola*), and piedbilledgrebe (*Podilymbus podiceps*). Marshes that have been disturbed are frequently dominated by aggressive weedy species such as purple loosestrife (*Lythrum salicaria*) and reedgrass (*Phragmites australis*). Deep emergent marshes also occur in excavations that contain standing water (e.g., roadside ditches, gravel pits).

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 2001

Sources: Bray 1915; Cowardin 1979; Gilman 1976 NYNHP field surveys.

2. Shallow emergent marsh: a marsh meadow community that occurs on mineral soil or deep muck soils (rather than true peat), that are permanently saturated and seasonally flooded. This marsh is better drained than a deep emergent marsh; water depths may range from 6 in to 3.3 ft (15 cm to 1 m) during flood stages, but the water level usually drops by mid to late summer and the substrate is exposed during an average year.

Approximately 75 acres of **shallow emergent marsh** are found at several sites throughout the town.

Most abundant herbaceous plants include bluejoint grass (*Calamagrostis canadensis*), cattails (*Typha latifolia, T. angustifolia, T. x glauca*), sedges (*Carex* spp.), marsh fern (*Thelypteris palustris*), manna grasses (*Glyceria pallida, G. canadensis*), spikerushes (*Eleocharis smalliana, E. obtusa*), bulrushes (*Scirpus cyperinus, S. tabernaemontani, S. atrovirens*), threeway sedge (*Dulichium arundinaceum*), sweetflag (*Acorus americanus*), tall meadow-rue (*Thalictrum pubescens*), marsh St. John's-wort (*Triadenum virginicum*), arrowhead (*Sagittaria latifolia*), goldenrods (*Solidago rugosa, S. gigantea*), eupatoriums (*Eupatorium maculatum, E. perfoliatum*), smartweeds (*Polygonum coccineum, P. amphibium, P. hydropiperoides*), marsh bedstraw (*Galium palustre*), jewelweed (*Impatiens capensis*), loosestrifes *(Lysimachia thyrsiflora, L. terrestris, L. ciliata*). Frequently in degraded examples reed canary grass (*Phalaris arundinacea*) and/or purple loosestrife (*Lythrum salicaria*) may become abundant.

Sedges (*Carex* spp.) may be abundant in shallow emergent marshes, but are not usually dominant. Marshes must have less than 50% cover of peat and tussock-forming sedges such as tussock sedges (*Carex stricta*), otherwise it may be classified as a sedge meadow. Characteristic shallow emergent marsh sedges include *Carex stricta, C. lacustris, C. lurida, C. hystricina, C. alata, C. vulpinoidea, C. comosa, C. utriculata, C. scoparia, C. gynandra, C. stipata,* and *C. crinita.*

Other plants characteristic of shallow emergent marshes (most frequent listed first) include blue flag iris (*Iris versicolor*), sensitive fern (*Onoclea sensibilis*), common skullcap (*Scutellaria galericulata*), beggerticks (*Bidens* spp.), water-horehounds (*Lycopus uniflorus, L. americanus*), bur-weeds (*Sparganium americanum, S. eurycarpum*), swamp milkweed (*Asclepias incarnata*), water-hemlock (*Cicuta bulbifera*), asters (*Aster umbellatus, A. puniceus*), marsh bellflower (*Campanula aparinoides*), water purslane (*Ludwigia palustris*), royal and cinnamon ferns (*Osmunda regalis, O. cinnamomea*), marsh cinquefoil (*Potentilla palustris*), rushes (*Juncus effusus*, *J. canadensis*), arrowleaf (*Peltandra virginica*), purple-stem angelica (*Angelica atropurpurea*), water docks (*Rumex orbiculatus, R. verticillatus*), turtlehead (*Chelone glabra*), waterparsnip (*Sium suave*), and cardinal flower (*Lobelia cardinalis*).

Shallow emergent marshes may have scattered shrubs including rough alder (*Alnus incana* ssp. *rugosa*), water willow (*Decodon verticillatus*), shrubby dogwoods (*Cornus amomum, C. sericea*), willows (*Salix* spp.), meadow sweet (*Spiraea alba* var. *latifolia*), and buttonbush (*Cephalanthus occidentalis*). Areas with greater than 50% shrub cover are classified as shrub swamps.

Amphibians that may be found in shallow emergent marshes include frogs such as eastern American toad (*Bufo a. americanus*), northern springpeeper (*Pseudoacris c. crucifer*), green frog

(*Rana clamitans melanota*), and wood frog (*Rana sylvatica*); and salamanders such as northern redback salamander (*Plethodon c. cinereus*) (Hunsinger 1999). Birds that may be found include red-winged blackbird (*Agelaius phoeniceus*), marsh wren (*Cistothorus palustris*), and common yellowthroat (*Geothlypis trichas*) (Levine 1998).

Shallow emergent marshes typically occur in lake basins and along streams often intergrading with deep emergent marshes, shrub swamps and sedge meadows and they may occur together in a complex mosaic in a large wetland.

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 2001

3. Shrub swamp: an inland wetland dominated by tall shrubs that occurs along the shore of a lake or river, in a wet depression or valley not associated with lakes, or as a transition zone between a marsh, fen, or bog and a swamp or upland community. The substrate is usually mineral soil or muck. This is a very broadly defined type that includes several distinct communities and many intermediates. Shrub swamps are very common and quite variable. They may be codominated by a mixture of species, or have a single dominant shrub species.

Approximately 43 acres of **shrub swamp** are found at several sites throughout the town.

In northern New York many shrub swamps are dominated by alder (*Alnus incana* ssp. *rugosa*); these swamps are sometimes called *alder thickets.* A swamp dominated by red osier dogwood (*Cornus sericea*), silky dogwood (*C. amomum*), and willows (*Salix* spp.) may be called a *shrub carr*. Along the shores of some lakes and ponds there is a distinct zone dominated by water-willows (*Decodon verticillatus*) and/or butonbush (*Cephalanthus occidentalis*) which can sometimes fill a shallow basin.

Characteristic shrubs that are common in these and other types of shrub swamps include meadow-sweet (*Spiraea alba* var. *latifolia*), steeple-bush (*Spiraea tomentosa*), gray dogwood (*Cornus foemina* ssp. *racemosa*), swamp azalea (*Rhododendron viscosum*), highbush blueberry (*Vaccinium corymbosum*), maleberry (*Lyonia ligustrina*), smooth alder (*Alnus serrulata*), spicebush (*Lindera benzoin*), willows (*Salix bebbiana, S. discolor, S. lucida, S. petiolaris*), wild raisin (*Viburnum cassinoides*), and arrowwood (*Viburnum recognitum*). More documentation and research is needed to distinguish the different types of shrub swamps in New York.

Birds that may be found in shrub swamps include common species such as common yellowthroat (*Geothlypis trichas*); and rare species such as American bittern (*Botaurus lentiginosus*), alder flycatcher (*Empidonax alnorum*), willow flycatcher (*E. trallii*), and Lincoln's sparrow (*Passerella lincolnii*) (Levine 1998).

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 2001

Sources: Bray 1915; Levine 1998; McVaugh 1958; Metzler and Tiner 1992; Shanks 1966; Tiner 1985; NYNHP field surveys.

C. FORESTED MINERAL SOIL WETLANDS

This subsystem includes seasonally flooded forests, and permanently flooded or saturated swamps. These forests and swamps typically have at least 50% canopy cover of trees. For the purposes of this classification, a tree is defined as a woody plant usually having one principal stem or trunk, a definite crown shape, and characteristically reaching a mature height of at least 16 ft (5 m) (Driscoll et al. 1984).

1. Floodplain forest: a hardwood forest that occurs on mineral soils on low terraces of river floodplains and river deltas. These sites are characterized by their flood regime; low areas are annually flooded in spring, and high areas are flooded irregularly. Some sites may be quite dry by late summer, whereas other sites may be flooded again in late summer or early autumn (these floods are caused by heavy precipitation associated with tropical storms). This is a broadly defined community; floodplain forests are quite variable and may be very diverse.

Approximately 273 acres of **floodplain forest** are located in the town.

With a ranking of S2 S3, this community is considered to be vulnerable in New York State.

The most abundant trees include silver maple (*Acer saccharinum*), ashes (*Fraxinus pensylvanica, F. nigra, F. americana*), cottonwood (*Populus deltoides*), red maple (*Acer rubrum*), box elder (*Acer negundo*), elms (*Ulmus americana, U. rubra*), hickories (*Carya cordiformis, C. ovata, C. laciniosa*), butternut and black walnut (*Juglans cinerea, J. nigra*), sycamore (*Platanus occidentalis*), oaks (*Quercus bicolor, Q. palustris*), and river birch (*Betula nigra*). Other less frequently occurring trees include hackberry (*Celtis occidentalis*), tulip tree (*Liriodendron tulipifera*), basswood (*Tilia americana*), and sugar maple (*Acer saccharum*). Introduced trees, such as white willow (*Salix alba*) and black locust (*Robinia pseudo-acacia*), have become established in some floodplain forests.

The most abundant shrubs include spicebush (*Lindera benzoin*), ironwood (*Carpinus carolinianus*), bladdernut (*Staphylea trifoliata*), speckled alder (*Alnus incana* spp. *rugosa*), dogwoods *(Cornus sericea, C. foemina* spp. *racemosa, C. amomum*), viburnums (*Viburnum cassinoides, V. prunifolium, V. dentatum, V. lentago*), and sapling canopy trees. Invasive exotic shrubs that may be locally abundant include shrub honeysuckles (*Lonicera tatarica, L. morrowii*), and multiflora rose (*Rosa multiflora*). Other less frequently occurring shrubs include meadowsweet (*Spiraea alba* var. *latifolia*) and winterberry (*Ilex verticillata*). The most abundant vines include poison ivy (*Toxicodendron radicans*), wild grapes (*Vitis riparia, Vitis* spp.), Virginia creeper (*Parthenocissus quinquefolia*), virgin's bower (*Clematis virginiana*), and less frequently, moonseed (*Menispermum canadense*). Vines may form a dense liana in tree canopy and/or dominate the groundcover.

The most abundant herbs include sensitive fern (*Onoclea sensibilis*), jewelweeds (*Impatiens capensis, I. pallida*), ostrich fern (*Matteuccia struthiopteris*), white snakeroot (*Eupatorium rugosum*), wood nettle (*Laportea canadensis*), false nettle (*Boehmeria cylindrica*), goldenrods (*Solidago gigantea, S. canadensis, Solidago* spp.), lizard's tail (*Saururus cernuus*), and jumpseed (*Polygonum virginianum*). Invasive exotic herbs that may be locally abundant include moneywort (*Lysimachia nummularia*), garlic mustard (*Alliaria petiolata*), dame's rockets (*Hesperis matronalis*), and stilt grass (*Microstegium vimineum*). Other less frequently occurring herbs include skunk cabbage (*Symplocarpus foetidus*), enchanter's nightshade (*Circaea lutetiana* ssp. *canadensis*), bluejoint grass (*Calamagrostis canadensis*), white avens (*Geum canadense*), clearweed (*Pilea pumila*), jack-in-the-pulpit (*Arisaema triphyllum*), rice cutgrass (*Leersia oryzoides*), sedges *(Carex lacustris, C. intumescens, C. lupulina*), and many others.

Characteristic birds include yellow-throated vireo (*Vireo flavifrons*), tufted titmouse (*Parus bicolor*), redbellied woodpecker (*Melanerpes carolinus*), and pileated woodpecker (*Dryocopus pileatus*). The composition of the forest apparently changes in relation to flood frequency and elevation of floodplain terraces along larger rivers. Neighboring states recognize several floodplain forest variants based on dominant plants, flood regime, and topographic position (Fike 1999, Kearsley 1999, Sorenson et al. 1998). The composition of floodplain forests in New York State has not been studied in sufficient detail to characterize compositional variations and how they correlate with flood regime and terrace elevation.

Distribution: throughout upstate New York, north of the Coastal Lowlands ecozone.

Rank: G3 G4 S2 S3 *Revised:* 2001

Sources: Barrett and Enser 1997; Bechtel and Sperduto 1998; Fike 1999; Gordon 1940; Kearsley 1999; Metzler and Damman 1985; Nichols et al. 2000; Sorenson et al. 1998; Veneman and Tiner 1990; NYNHP field surveys.

5. Silver maple-ash swamp: a hardwood basin swamp that typically occurs in poorly-drained depressions or along the borders of large lakes, and less frequently in poorly drained soils along rivers. These sites are characterized by uniformly wet conditions with minimal seasonal fluctuations in water levels.

The dominant trees are usually silver maple (*Acer saccharinum*) and green ash (*Fraxinus pennsylvanica*). American elm (*Ulmus americana*) is often present and probably was a codominant prior to the onset of Dutch elm disease and elm yellows. Other trees include black ash (*F. nigra*), white ash (*F. americana*), swamp white oak (*Quercus bicolor*), red maple (*Acer rubrum*), and occasionally the silver maple-red maple hybrid "Freeman's maple" (*Acer x freemanii*). Many of the canopy trees occur in the subcanopy along with ironwood (*Carpinus carolinianus*).

Approximately 406 acres of **silver maple-ash swamp** are found in the town, predominantly in the eastern portion. Relatively large examples of this community are located: north of Bortle Road in the northeast corner; north of Augustine Road; and in the southeast corner of the Town.

With a ranking of S2 S3, this community is considered vulnerable in New York State.

Characteristic shrubs include winterberry (*Ilexverticillata*), spicebush (*Lindera benzoin*), variousshrubby dogwoods *(Cornus foemina ssp. racemosa, C. amomum,* and *C. sericea*), various viburnums (*Viburnumrecognitum, V. lentago,* and V. *cassinoides*), speckledalder (*Alnus incana* ssp. *rugosa*), gooseberries (*Ribes*spp.), and sapling canopy trees. Characteristic vinesinclude Virginia creeper (*Parthenocissus quinquefolia*) and poison ivy (*Toxicodendron radicans*).

Characteristic herbs include sensitive fern (*Onoclea sensibilis*), skunk cabbage (*Symplocarpus foetidus*), false nettle (*Boehmeria cylindrica*), wood-nettle (*Laportea canadensis*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*O. regalis*), marsh fern (*Thelypteris palustris*), jewelweed (*Impatiens capensis*), mannagrasses (*Glyceris striata, G. grandis*), and various sedges (*Carex lupulina, C. crinita, C. bromoides,* and *C. lacustris*). Other herbs in wetter examples include arrow arum (*Peltandra virginica*), arrowheads (*Sagittaria* spp.), wild calla (*Calla palustris*), cattail (*Typha latifolia*), and duckweeds (*Lemna* spp.). A few examples are dominated by reed canary grass (*Phalaris arundinacea*) and/or lizard's tail (*Sauruus cernuus*). Silver maple-ash swamps are often underlain by calcareous bedrock and may contain a few calciphilic species, such as northern white cedar (*Thuja occidentalis*) and alder-leaf buckthorn (*Rhamnus alnifolia*). Ash-elm dominated swamps with little or no maple are tentatively included here until more data are collected on this variant.

Data on characteristic animals are needed.

Distribution: in central and western New York in the Appalachian Plateau ecozone, and in the Champlain Valley sub-zone of the Lake Champlain ecozone.

Rank: G3 G4 S2 S3 *Revised:* 2001

Source: Huenneke 1982; NYNHP field surveys.

8. Hemlock-hardwood swamp: a mixed swamp that occurs on mineral soils and deep muck in depressions which receive groundwater discharge, typically in areas where the aquifer is a basic or acidic substrate. These swamps usually have a fairly closed canopy (70 to 90% cover), sparse shrublayer, and low species diversity. The tree canopy is typically dominated by hemlock (Tsuga canadensis), and co-dominated by yellow birch (Betula alleghaniensis), and red maple (Acer rubrum). Other less frequently occurring tree include white pine (Pinus strobus), black gum (Nyssa sylvatica), and green ash (Fraxinus pennsylvanica).
Characteristic shrubs include saplings of canopy trees plus highbush blueberry (Vaccinium corymbosum) often dominant, with great rhododendron (Rhododenron maximum) and sweet pepperbush (Clethra alnifolia) becoming more common in Lower Hudson Valley examples. Other less frequently occurring shrubs include various viburnums (Viburnumcassinoides, V. lentago, and V. lanatanoides), winterberry (Ilex verticillata), and mountain holly (Nemopanthus mucronatus). Characteristic herbs are cinnamon fern (Osmunda cinnamomea) and sensitive fern (Onoclea sensibilis). Groundcover may also be fairly sparse. Other less frequently occurring herbs include sedges (Carex trisperma, C. folliculata, and C. bromoides), goldthread (Coptis trifolia), Canada mayflower (Maianthemum canadense), mountain sorrel (Oxalis montana), foamflower (Tiarella cordifolia), and sarsparilla (Aralia nudicaulis).

This is a common and widespread swamp community. Some occurrences are very small (1 to 2 acres). Water levels in these swamps typically fluctuate seasonally: they may be flooded in spring and relatively dry by late summer.

Approximately 27 acres of **hemlock-hardwood swamp** are found east and west of Log Cabin Road in the northwestern portion of the Town.

With a ranking of S2 S3, this community is considered vulnerable in New York State.

Distribution: throughout upstate New York, north of the Coastal Lowlands ecozone.

Rank: G4G5 S4 Revised: 2001

Sources: Bray 1915; McVaugh 1958; NYNHP field surveys.

D. FORESTED PEATLANDS

This subsystem includes peatlands with at least 50% canopy cover of trees. Substrates range from coarse woody or fibrous peat to fine-grained marl and organic muck.

3. Red maple-tamarack peat swamp: a mixed swamp that occurs on organic soils (peat or muck) in poorly drained depressions. These swamps are often spring fed or enriched by seepage of minerotrophic groundwater resulting in a stable water table and continually saturated soil. Soils are often rich in calcium.

Approximately 12 acres of **red maple-tamarack peat swamp** are found in the Town along Strong Road and north of Shire Lane in the west-central portion of the Town.

With a ranking of S2 S3, this community is considered vulnerable in New York State.

The dominant trees are red maple (Acer rubrum) and tamarack (Larix laricina). These species usually form an open canopy (50 to 70% cover) with numerous small openings dominated by shrubs or sedges. Other less frequently occurring trees include black spruce (Picea mariana), white pine (Pinus strobus), black ash (Fraxinus nigra), ironwood (Carpinus carolinianus), and northern white cedar (Thuja occidentalis). Characteristic shrubs are alders (Alnus incana ssp. rugosa, A. serrulata), winterberry (Ilex verticillata), various shrubby dogwoods especially red osier dogwood (Cornus sericea), willows (Salix spp.), highbush blueberry (Vaccinium corymbosum),dwarf raspberry (Rubus pubescens), along with many rich shrub fen species such as swamp birch (Betula pumila), alder-leaf buckthorn (Rhamnus alnifolia), poison sumac (Toxicodendron vernix), swamp fly honeysuckle (Lonicera oblongifolia), and shrubby cinquefoil (Potentilla fruticosa). Other less frequently occurring shrubs include black chokeberry (Aronia melanocarpa)and mountain holly (Nemopanthus mucronatus).
The herb layer is often very diverse and usually includes calcium rich indicator species. Characteristic herbs are sedges such as Carex trisperma, C. interior, C. stricta, C. lacustris, and C. leptalea. and ferns such as royal fern (Osmunda regalis), cinnamon fern (O. cinnamomea), marsh fern (Thelypteris palustris), and crested wood fern (Dryopteris cristata), along with skunk cabbage (Symplocarpus foetidus), marsh marigold (Caltha palustris), and water horehound (Lycopus uniflorus). Other less frequently occurring herbs include cattail (Typha latifolia), goldthread (Coptis trifolia), flattopped aster (Aster umbellatus), fowl manna grass (Glyceria striata), water horsetail (Equisetum fluviatile), buckbean (Menyanthes trifoliata), starflower (Trientalis borealis), goldenrods (Solidago patula, S. uliginosa), golden ragwort (Senecio aureus), marsh cinquefoil (Potentilla palustris).
The bryophyte layer is dominated by several species of Sphagnum moss, including S. magellanicum, S. angustifolium, and S. warnstorfii.

Data on characteristic animals are needed. These swamps are closely related to and often grade into rich shrub fens and rich graminoid fens.

Distribution: scattered throughout upstate New York, north of the Coastal Lowlands ecozone.

Rank: G3G4 S2S3 Revised: 2001

Sources: McVaugh 1958; NYNHP field surveys.

5. Northern white cedar swamp: a conifer or mixed swamp that occurs on organic soils in cool, poorly drained depressions in central and northern New York, and along lakes and streams in the northern half of the state. These swamps are often spring fed or enriched by seepage of cold, minerotrophic groundwater, resulting in a stable water table and continually saturated soils. Soils are often rich in calcium. At some sites these soils have developed above a marl substrate.

The characteristic tree is northern white cedar (Thuja occidentalis), which makes up more than 30% of the canopy cover. Thuja may form nearly pure stands, or it may be mixed with other conifers and hardwoods, including red maple (Acer rubrum), hemlock (Tsuga canadensis), balsam fir (Abies balsamea), tamarack (Larix laricina), yellow birch (Betula alleghaniensis), black ash (Fraxinus nigra), white pine (Pinus strobus), and black spruce (Picea mariana).

Approximately 55 acres of **northern white cedar swamp** are found in the Town west of the Village of Victor, south of NYS Route 96 and along NYS Route 251 south of Victor-Mendon Road.

With a ranking of S2 S3, this community is considered vulnerable in New York State.

The shrublayer is usually sparse; characteristic species are dwarf raspberry (Rubus pubescens), red osier dogwood (Cornus sericea), swamp fly honeysuckle (Lonicera oblongifolia), and highbush blueberry (Vaccinium corymbosum). The groundlayer is typically diverse, with many bryophytes and boreal herbs. There are typically many hummocks formed by decaying downed trees or tip-up mounds.

Characteristic herbs on the hummocks are the sedges Carex leptalea and C. eburnea, oak fern (Gymnocarpium dryopteris), gold thread (Coptis trifolia), starflower (Trientalis borealis), bunchberry (Cornus canadensis), miterwort (Mitella nuda), Canada mayflower (Maianthemum canadense), blue bead lily (Clintonia borealis), snowberry (Gaultheria hispidula), and partridge berry (Mitchella repens).

Characteristic herbs of hollows between the hummocks are the sedge C. intumescens, sensitive fern (Onoclea sensibilis), marsh fern (Thelypteris palustris), cinnamon fern (Osmunda cinnamomea), royal fern (O. regalis), crested wood fern (Dryopteris cristata), showy lady's-slipper (Cypripedium reginae), yellow lady's slipper (Cypripedium calceolus), and golden ragwort (Senecio aureus).

Characteristic bryophytes are several species of Sphagnum moss, feathermosses such as Hylocomium splendens and Ptilium crista-castrensis, and leafy liverworts such as Bazzania trilobata and Trichocolea tomentella.

Characteristic birds include northern waterthrush (Seiurus noveboracensis), winter wren (Troglodytes troglodytes), white-throated sparrow (Zonotrichia albicollis), and golden-crowned kinglet (Regulus satrapa).

Distribution: scattered across upstate New York, extending north from the Appalachian Plateau ecozone.

Rank: G3G4 S2S3 Revised: 1990

VI. TERRESTRIAL SYSTEM

The terrestrial system consists of upland habitats. These habitats have well-drained soils that are dry to mesic (never hydric), and vegetative cover that is never predominantly hydrophytic, even if the soil surface is occasionally or seasonally flooded or saturated. In other words, this is a broadly defined system that includes everything except aquatic, wetland, and subterranean communities.

A. OPEN UPLANDS

This subsystem includes upland communities with less than 25% canopy cover of trees; the dominant species in these communities are shrubs, herbs, or cryptogammic plants (mosses, lichens, etc.). Three distinctive physiognomic types are included in this subsystem. Grasslands include communities that are dominated by grasses and sedges; they may include scattered shrubs (never more than 50% cover of shrubs), and scattered trees (usually less than one tree per acre, or 3 trees per hectare). Meadows include communities with forbs, grasses, sedges, and shrubs codominant; they may include scattered trees. Shrublands include communities that are dominated by shrubs (more than 50% cover of shrubs); they may include scattered trees.

25. Successional old field: a meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned.

Approximately 2,138 acres of **successional old field** are located throughout the town.

Characteristic herbs include goldenrods (*Solidago altissima, S. nemoralis, S. rugosa, S. juncea, S. canadensis,* and *Euthamia graminifolia*), bluegrasses (*Poa pratensis, P. compressa*), timothy (*Phleum pratense*), quackgrass (*Agropyron repens*), smoothbrome (*Bromus inermis*), sweet vernal grass (*Anthoxanthum odoratum*), orchard grass (*Dactylis glomerata*), common chickweed (*Cerastium arvense*), common evening primrose (*Oenothera biennis*), oldfield cinquefoil (*Potentilla simplex*), calico aster (*Aster lateriflorus*), New England aster (*Aster novae-angliae*), wild strawberry (*Fragaria virginiana*), Queen-Anne'slace (*Daucus corota*), ragweed (*Ambrosia artemisiifolia*), hawkweeds (*Hieracium* spp.), dandelion (*Taraxacum officinale*), and ox-tongue (*Picris hieracioides*).

Shrubs may be present, but collectively they have less than 50% cover in the community. Characteristic shrubs include gray dogwood (*Cornus foemina* ssp. *racemosa*), silky dogwood (*Cornus amomum*), arrowwood (*Viburnum recognitum*), raspberries (*Rubus* spp.), sumac (*Rhus typhina, R. glabra*), and eastern red cedar (*Juniperus virginiana*).

A characteristic bird is the field sparrow (*Spizella pusilla*). This is a relatively short-lived community that succeeds to a shrubland, woodland, or forest community.

Distribution: throughout New York State.

Rank: G4 S4 *Revised:* 1990

26. Successional shrubland: a shrubland that occurs on sites that have been cleared (for farming, logging, development, etc.) or otherwise disturbed. This community has at least 50% cover of shrubs.

Approximately 1,240 acres of this community are found in the town, including **successional shrubland** mixed with **successional northern hardwoods, succession southern hardwoods and conifer plantation**.

Characteristic shrubs include gray dogwood (*Cornus foemina* ssp. *racemosa*), eastern red cedar (*Juniperus virginiana*), raspberries (*Rubus* spp.), hawthorne (*Crataegus* spp.), serviceberries (*Amelanchier* spp.), choke-cherry (*Prunus virginiana*), wild plum (*Prunus americana*), sumac (*Rhus glabra, R. typhina*), nanny-berry (*Viburnum lentago*), arrowwood (*Viburnum recognitum*), and multiflora rose (*Rosa multiflora*).

Birds that may be found in successional shrublands brown thrasher, blue-winged warbler, golden-winged warbler, chestnut-sided warbler, yellow-breasted chat, eastern towhee, field sparrow, song sparrow, and indigo bunting (Levine 1998).

Distribution: throughout New York State.

Rank: G4 S4 *Revised:* 1990

Source: NYNHP field surveys.

C. FORESTED UPLANDS

This subsystem includes upland communities with more than 60% canopy cover of trees; these communities occur on substrates with less than 50% rock outcrop or shallow soil over bedrock.

11. Appalachian oak-hickory forest: a hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants.

The dominant trees include one or more of the following oaks: red oak (Quercus rubra), white oak (Q. alba), and black oak (Q. velutina). Mixed with the oaks, usually at lower densities, are one or more of the following hickories: pignut (Carya glabra), shagbark (C. ovata), and sweet pignut (C. ovalis). Common associates are white ash (Fraxinus americana), red maple (Acer rubrum), and Eastern hop hornbeam (Ostrya virginiana).

Approximately 726 acres of **Appalachian oak-hickory forest** are found in the Town. The largest area is located in the northwest corner of the Town between I-490 and I-90, at the northern border of the Town north of Highpoint Drive, in the east-central portion of the Town, in the western part of the Town north of Dryer Road, and in the southwest area south of Boughton Hill Road.

With a ranking of S4, this community is considered "apparently secure" in New York State.

There is typically a subcanopy stratum of small trees and tall shrubs including flowering dogwood (Cornus florida), witch hazel (Hamamelis virginiana), shadbush (Amelanchier arborea), and choke cherry (Prunus virginiana). Common low shrubs include maple-leaf viburnum (Viburnum acerifolium), blueberries (Vaccinium angustifolium, V. pallidum), red raspberry (Rubus idaeus), gray dogwood (Cornus foemina ssp. racemosa), and beaked hazelnut (Corylus cornuta). The shrublayer and groundlayer flora may be diverse.

Characteristic groundlayer herbs are wild sarsaparilla (Aralia nudicaulis), false Solomon's seal (Smilacina racemosa), Pennsylvania sedge (Carex pensylvanica), tick-trefoil (Desmodium glutinosum, D. paniculatum), black cohosh (Cimicifuga racemosa), rattlesnake root (Prenanthes alba), white goldenrod (Solidago bicolor), and hepatica (Hepatica americana).
Characteristic animals include red-bellied woodpecker (Melanerpes carolinus), whip-poor-will (Caprimulgus vociferus), and wild turkey (Meleagris gallopavo).

Distribution: throughout upstate New York north of the Coastal Lowlands ecozone; most common south of the Adirondacks ecozone.

Rank: G4G5 S4 Revised: 1990

Sources: McIntosh 1972; Ross 1958; NYNHP field surveys.

26. Successional northern hardwoods: a hardwood or mixed forest that occurs on sites that have been cleared or otherwise disturbed.

Characteristic trees and shrubs include any of the following: quaking aspen (*Populus tremuloides*), bigtooth aspen (*P. grandidentata*), balsam poplar (*P. balsamifera*), paper birch (*Betula papyrifera*), or gray birch (*B. populifolia*), pin cherry (*Prunus pensylvanica*), black cherry (*P. serotina*), red maple (*Acer rubrum*), white pine (*Pinus strobus*), with lesseramounts of white ash (*Fraxinus americana*), green ash (*F. pensylvanica*), and American elm (*Ulmus americana*). Northern indicators include aspens, birches, and pin cherry. This is a broadly defined community and several seral and regional variants are known.

Approximately 4,318 acres of **successional northern hardwoods** are found throughout the town.

Characteristic birds include chestnut-sided warbler (*Dendroica pensylvanica*), Nashville warbler (*Vermivora ruficapilla*) in young forests with aspen and birch seedlings, and yellow-bellied sapsucker (*Sphyrapicus varius*) in mature aspen forests.

Distribution: throughout upstate New York north of the Coastal Lowlands ecozone.

Rank: G5 S5 *Revised:* 2001

Source: Mellinger and McNaughton 1975; NYNHP field surveys.

27. Successional southern hardwoods: a hardwood or mixed forest that occurs on sites that have been cleared or otherwise disturbed.

Characteristic trees and shrubs include any of the following: American elm (Ulmus americana), slippery elm (U. rubra), white ash (Fraxinus americana), red maple (Acer rubrum), box elder (Acer negundo), silver maple (A. saccharinum), sassafras (Sassafras albidum), gray birch (Betula populifolia), hawthorns (Crataegus spp.), eastern red cedar (Juniperus virginiana), and choke-cherry (Prunus virginiana). Certain introduced species are commonly found in successional forests, including black locust (Robinia pseudo-acacia), tree-of-heaven (Ailanthus altissima), and buckthorn (Rhamnus cathartica). Any of these may be dominant or codominant in a successional southern hardwood forest. Southern indicators include American elm, white ash, red maple, box elder, choke-cherry, and sassafras. This is a broadly defined community and several seral and regional variants are known.

A characteristic bird is chestnut-sided warbler (Dendroica pensylvanica).

Approximately 653 acres of **successional southern hardwoods** are located throughout the town, with larger areas in the southwest corner, north central portions of the town.

Distribution: primarily in the southern half of New York, south of the Adirondacks.

Rank: G5 S5 Revised: 2001

Sources: Eyre 1980; NYNHP field surveys.

D. TERRESTRIAL CULTURAL

This subsystem includes communities that are either created and maintained by human activities, or are modified by human influence to such a degree that the physical conformation of the substrate, or the biological composition of the resident community is substantially different from the character of the substrate or community as it existed prior to human influence.

1. Cropland. Row crops: an agricultural field planted in row crops such as corn, potatoes, and soybeans. This community includes vegetable gardens in residential areas. **Field crops:** an agricultural field planted in field crops such as alfalfa, wheat, timothy, and oats. This community includes hayfields that are rotated to pasture.

Approximately 3,339 acres of **cropland** throughout the town

Characteristic birds include grasshopper sparrow (*Ammodramus savannarum*), vesper sparrow (*Pooecetes gramineus*), bobolink (*Dolichonys oryzivorous*), mourning dove (*Zenaida macroura*), and upland sandpiper (*Bartramia longicauda*)

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

3. Pastureland: agricultural land permanently maintained (or recently abandoned) as a pasture area for livestock. Characteristic birds include grasshopper sparrow (*Ammodramus savannarum*), vesper sparrow (*Pooecetes gramineus*), horned lark (*Eremophila alpestris*), killdeer (*Charadrius vociferus*), and upland sandpiper (*Bartramia longicauda*).

Approximately 388 acres of **pastureland** throughout the town.

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

4. Flower/herb garden: residential, commercial, or horticultural land cultivated for the production of ornamental herbs and shrubs. This community includes gardens cultivated for the production of culinary herbs.

Approximately 74 acres of **flower/herb garden** located at Ganondagan State Historical Site, north and south of County Road 41.

Characteristic birds include American robin (*Turdusmigratorius*) and mourning dove (*Zenaida macroura*). *Distribution:* throughout New York State.

Rank: G5 S5 *Revised:* 1990

5. Orchard: a stand of cultivated fruit trees (such as apples, cherries, peaches, pears, etc.), often with grasses as a groundcover. An orchard may be currently under cultivation or recently abandoned.

Approximately 76 acres of **orchard** located east of NYS Route 444 in the southern part of the Town.

Staghorn sumac (*Rhus typhina*), goldenrods (*Solidago* spp.), and poison ivy (*Toxicodendron radicans*) may be commonin abandoned orchards. Characteristic birds include American robin (*Turdus migratorius*), eastern kingbird (*Tyrannus tyrannus*), mourning dove (*Zenaida macroura*), and in mature orchards with a minimum dbh of 10 in (about 25 cm), yellow-bellied sapsucker (*Sphyrapicus varius*).

Distribution: throughout New York State at low elevations.

Rank: G5 S5 *Revised:* 1990

10. Conifer plantation: a stand of softwoods planted for the cultivation and harvest of timber products, or to provide wildlife habitat, soil erosion control, windbreaks, or landscaping. This is a broadly defined community that excludes stands in which pine, spruce, or fir are dominant, although they may be present at low densities. These plantations may be monocultures, or they may be mixed stands with two or more codominant species.

Approximately 311 acres throughout the town are conifer plantations.

Softwoods that are typically planted in these plantations include European larch (*Larix decidua*), Japanese larch (*Larix kaempferi*), and northern white cedar (*Thuja occidentalis*). Groundlayer vegetation is usually sparse, apparently because of the dense accumulation of leaf litter. Speedwell (*Veronica officinalis*) is a characteristic groundlayer plant. More data on this community are needed.

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

11. Mowed lawn with trees: residential, recreational, or commercial land in which the groundcover is dominated by clipped grasses and forbs, and it is shaded by at least 30% cover of trees. Ornamental and/or native shrubs may be present, usually with less than 50% cover. The groundcover is maintained by mowing.

Approximately 370 acres throughout the Town.

Characteristic animals include gray squirrel (*Sciurus carolinensis*), American robin (*Turdus migratorius*), mourning dove (*Zenaida macroura*), and mockingbird (*Mimus polyglottos*).

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

12. Mowed lawn: residential, recreational, or commercial land, or unpaved airport runways in which the groundcover is dominated by clipped grasses and there is less than 30% cover of trees. Ornamental and/or native shrubs may be present, usually with less than 50% cover. The groundcover is maintained by mowing.

Approximately 4,720 acres throughout the Town.

Characteristic birds include American robin (*Turdus migratorius*), upland sandpiper (*Bartramia longicauda*), and killdeer (*Charadrius vociferus*).

Distribution: throughout New York State.

14. Herbicide-sprayed roadside/pathway: a narrow strip of low-growing vegetation along the side of a road, or along utility right-of-way corridors (e.g., power lines, telephone lines, gas pipelines) that is maintained by spraying herbicides.

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

Approximately 33 acres located under the power lines in the north part of the Town.

15. Unpaved road/path: a sparsely vegetated road or pathway of gravel, bare soil, or bedrock outcrop. These roads or pathways are maintained by regular trampling or scraping of the land surface. The substrate consists of the soil or parent material at the site, which may be modified by the addition of local organic material (woodchips, logs, etc.) or sand and gravel.

One characteristic plant is path rush (*Juncus tenuis*). A characteristic bird is killdeer (*Charadrius vociferus*).

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

Approximately 0.8 acres of unpaved road in the northwest corner of the Town.

17. Paved road/path: a road or pathway that is paved with asphalt, concrete, brick, stone, etc. There may be sparse vegetation rooted in cracks in the paved surface.

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

Approximately 317 acres comprise I-490 and I-90 and the highway interchanges.

21. Gravel mine: an excavation in a gravel deposit from which gravel has been removed. Often these are dug into glacial deposits such as eskers or kames.

Vegetation may be sparse if the mine is active; there may be substantial vegetative cover if the mine has been inactive for several years. Near-vertical slopes are used by bank swallows (*Riparia riparia*) for nesting sites.

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

Approximately 269 acres of gravel mines are located west of Philips Road, south of Dryer Road, and east and west of Malone Road.

22. Sand mine: an excavation in a sand deposit or sand dune from which sand has been removed. Vegetation is usually sparse.

A characteristic bird is bank swallow (*Riparia riparia*).

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

One area of approximately 3.7 acres is located northeast of NYS Route 96 between Rowley Road and Lane Road.

27. Construction/road maintenance spoils: a site where soil from construction work and/or road maintenance materials have been recently deposited. There is little, if any, vegetation.

Approximately 17 acres are included in this classification, located north of Bortle Road; northwest I-90 across NYS Route 96; and in other small areas.

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

33. Urban structure exterior: the exterior surfaces of metal, wood, or concrete structures (such as commercial buildings, apartment buildings, houses, bridges) or any structural surface composed of inorganic materials (glass, plastics, etc.) in an urban or densely populated suburban area. These sites may be sparsely vegetated with lichens, mosses, and terrestrial algae; occasionally vascular plants may grow in cracks. Nooks and crannies may provide nesting habitat forbirds and insects, and roosting sites for bats.

Approximately 296 acres are included in this classification.

Characteristic birds include common nighthawk (*Chordeiles minor*) on rooftops, American robin (*Turdus migratorius*) on porches or under shelter, and exotic birds such as rock dove (*Columba livia*) and house sparrow (*Passer domesticus*).

Distribution: throughout New York State.

Rank: G5 S5 *Revised:* 1990

34. Rural structure exterior: the exterior surfaces of metal, wood, or concrete structures (such as commercial buildings, barns, houses, bridges) or any structural surface composed of inorganic materials (glass, plastics, etc.) in a rural or sparsely populated suburban area. These sites may be sparsely vegetated with lichens, mosses, and terrestrial algae; occasionally vascular plants may grow in cracks. Nooks and crannies may provide nesting habitat for birds and insects, and roosting sites for bats. Characteristic birds include American robin (*Turdus migratorius*) on porches or under shelter, barn swallow (*Hirundo rustica*) under shelter, and exotic birds such as rock dove (*Columba livia*), house sparrow (*Passer domesticus*), and European starling (*Sturnus vulgaris*). *Distribution:* throughout New York State.

Approximately 96 acres are included in this classification.

Rank: G5 S5 *Revised:* 1990

Parking area

This category was developed by Dr. Bruce Gilman for the Ontario County Land Cover Analysis. It includes large parking areas associated with business and institutional facilities.

Approximately 501 acres are included in this classification.

Outdoor recreation

This category was developed by Dr. Bruce Gilman for the Ontario County Land Cover Analysis. It includes public parks, athletic fields and tennis courts.

Approximately 950 acres are included in this classification.

Town of Victor Open Space Index - Appendix B
Land Cover Categories and Acreages

Febuary 2014

Ecological Community Classification				Acres	Global Rank	State Rank
Natural Resources						
III.	**Riverine System**					
	A.	**Natural Streams**				
		CR	Confined River	34.9	G4	S4
IV.	**Lacustrine System**					
	A.	**Natural Lakes and Ponds**				
		EP	Eutrophic Pond	37.9	G4	S4
	B.	**Lacustrine Cultural**				
		FP/AP	Farm Pond/Artificial Pond	114.1	G5	S5
V.	**Palustrine System**					
	A.	**Open Mineral Soil Wetlands**				
		DEM	Deep Emergent Marsh	160.2	G5	S5
		SEM	Shallow Emergent Marsh	63.3	G5	S5
		SEM//FF	Shallow Emergent Marsh//Floodplain Forest	11.8		
		SS	Shrub Swamp	41.0	G5	S5
		SS//SNH	Shrub Swamp//Successional Northern Hardwoods	1.5		
	C.	**Forested Mineral Soil Wetlands**				
		FF	Floodplain Forest	273.1	G3 G4	S2 S3
		SM-AS	Silver Maple-Ash Swamp	405.7	G3 G4	S2 S3
		H-HS	Hemlock-Hardwood Swamp	27.2	G3 G4	S2 S3
	D.	**Forested Peatlands**				
		RM-TPS	Red Maple-Tamarack Peat Swamp	12.3	G3 G4	S2 S3
		NWCS	Northern White Cedar Swamp	54.9	G3 G4	S2 S3
VI.	**Terrestrial System**					
	A.	**Open Uplands**				
	*	SOF	Successional Old Field	1,853.8	G4	S4
		SOF//SNH	Successional Old Field//Successional Northern Hardwoods	3.9		
	*	SOF//SUC.S	Successional Old Field//Successional Shrubland	237.4		
	*	SUC.S	Successional Shrubland	1,172.4	G4	S4
	*	SUC.S//CP	Successional Shrubland//Conifer Plantation	0.8		
		SUC.S//SNH	Successional Shrubland//Successional Northern Hardwoods	119.5		
		SUC.S//SSH	Successional Shrubland//Successional Southern Hardwoods	1.2		
	*	*NOTE: The Town considers these land cover types to be both agricultural and natural resources. The total open space does not "double-count" these acreages.*				
	C.	**Forested Uplands**				
		AO-HF	Appalachian Oak-Hickory Forest	726.4	G4 G5	S4
		SNH	Successional Northern Hardwoods	4,317.8	G5	S5
		SSH	Successional Southern Hardwoods	653.5	G5	S5

NOTE: Based on preliminary data provided by the Ontario County Planning Department, 2013

SOURCE: Ecological Communities of New York State, Second Edition, 2002

Town of Victor Open Space Index - Appendix B
Land Cover Categories and Acreages
Febuary 2014

Ecological Community Classification				Acres	Global Rank	State Rank
Agricultural Resources						
VI.	**Terrestrial System**					
	A.	**Open Uplands**				
	*	SOF	Successional Old Field	1,853.8	G4	S4
	*	SOF//SUC.S	Successional Old Field//Successional Shrubland	237.4		
	*	SUC.S	Successional Shrubland	1,172.4	G4	S4
	*	SUC.S//CP	Successional Shrubland//Conifer Plantation	0.8		
		SOF/CP	Successional Old Field/Conifer Plantation	5.7		
	*	*NOTE: The Town considers these land cover types to be both agricultural and natural resources. The total open space does not "double-count" these acreages.*				
	D.	**Terrestrial Cultural**				
		P	Pastureland	387.7	G5	S5
		F/HG	Flower/Herb Garden	73.7	G5	S5
		O	Orchard	76.2	G5	S5
		CP	Conifer Plantation	310.7	G5	S5
		C	Cropland	3,338.7	G5	S5
Cultural Resources						
VI.	**Terrestrial System**					
	D.	**Terrestrial Cultural**				
		OR	Outdoor Recreation	950.0		
		GM	Gravel Mine	268.8	G5	S5
		SAN.M	Sand Mine	3.7	G5	S5
			TOTAL OPEN SPACE:	**15,743.0**		
Not Open Space						
VI.	**Terrestrial System**					
	D.	**Terrestrial Cultural**				
		MLWT	Mowed Lawn With Trees	370.4	G5	S5
		ML	Mowed Lawn	4,719.7	G5	S5
		H-SR/P	Herbicide-Sprayed Roadside/Pathway	33.2	G5	S5
		UR/P	Unpaved Road/path	0.8	G5	S5
		PA	Parking Area	496.8		
		PR/P	Paved Road/Path	316.8	G5	S5
		C/RMS	Construction/Road Maintenance Spoils	16.9	G5	S5
		USE	Urban Structure Exterior	296.0	G5	S5
		RSE	Rural Structure Exterior	95.8	G5	S5
		USE/PA	Urban Structure Exterior/ Parking Area	1.6		
			Unaccounted for	1,002.9		
			Total Not Open Space:	**7,351.0**		

NOTE: Based on preliminary data provided by the Ontario County Planning Department, 2013
SOURCE: Ecological Communities of New York State, Second Edition, 2002

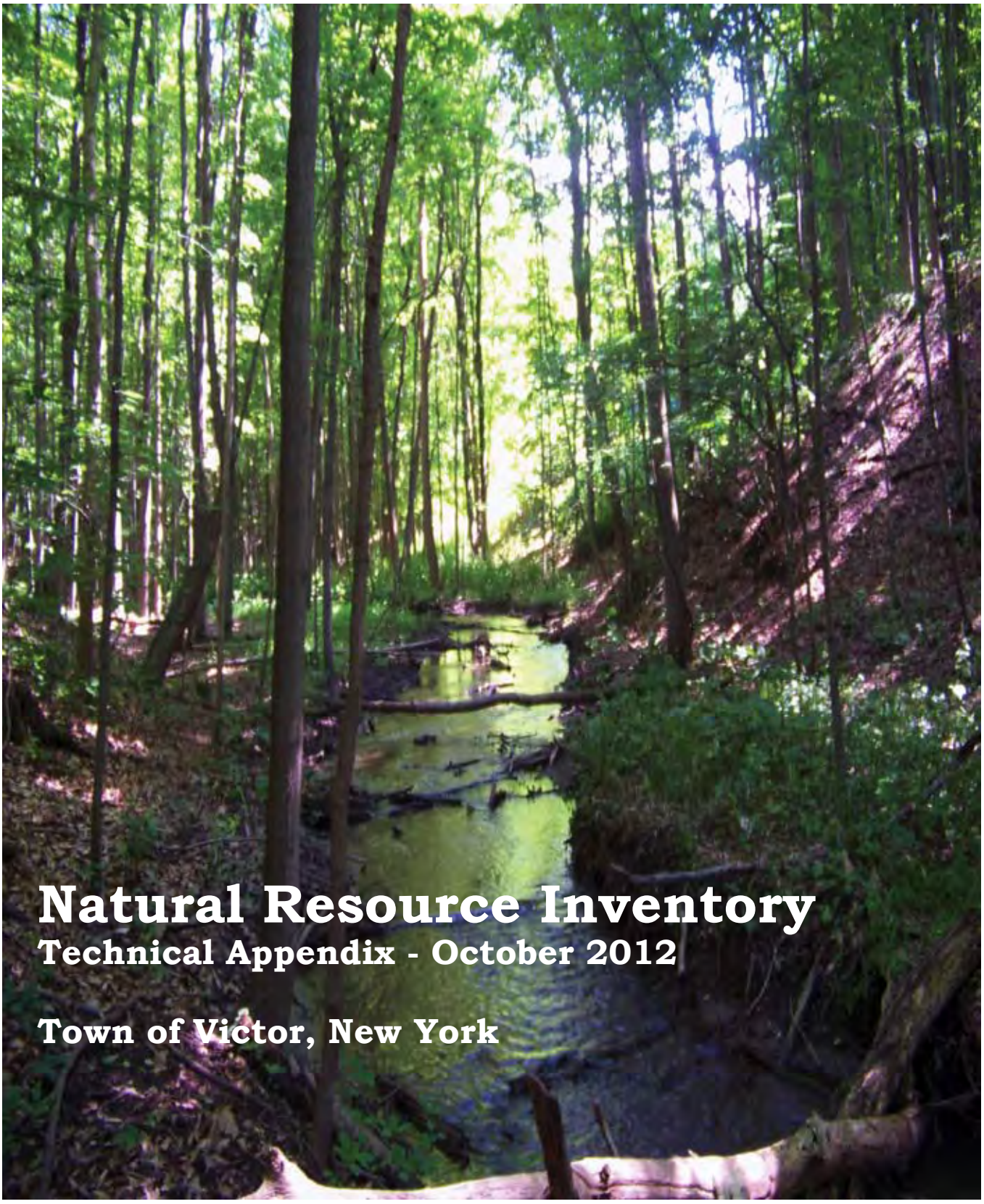
NATURAL RESOURCE INVENTORY & ASSESSMENT

TOWN OF VICTOR, NEW YORK

APRIL 2014

Volume 3

Technical Appendices & Field Data



Natural Resource Inventory

Technical Appendix - October 2012

Town of Victor, New York

TOWN OF VICTOR NEW YORK

BME ASSOCIATES

ENGINEERS • SURVEYORS • LANDSCAPE ARCHITECTS

VICTOR NRI | TECHNICAL APPENDIX

Table of Contents

This Technical Appendix includes field data and photos that we collected during the development of the NRI co-occurrence areas, and their natural resources. It also includes ranking methodology with photos and an example. A list of parcels within the co-occurrence areas is included in this Technical Appendix as well.

Appendix A: Data Sheets and Photos of Co-occurrences which were field surveyed for:

- Irondequoit Creek
- Ganargua Creek
- Sucker Brook
- White Brook
- Great Brook
- Fish Creek

Appendix B: Ranking Methodologies and Examples

- Section 1 - Ranking Methodology
- Section 2 - Photo Examples of Natural Resources
  - Forested Wetlands
  - Emergent Marsh
  - Mature Woods
  - Mixed Woods
  - Young Woods
  - Streams
- Section 3 - Ranking Example for "IC-2"

Appendix C: List of Parcels within Co-occurrence Areas

APPENDIX A

DATA SHEETS AND PHOTOS OF CO-OCCURRENCES WHICH WERE FIELD SURVEYED

IRONDEQUOIT CREEK

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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence # 1

Co-occurrence Location: Location: Along Irondequoit Creek in the northwest corner of the Town of Victor, south of Powder Mills Park, north of I-90 (NYS Thruway), west of Fisher Road, and both north and south of Railroad Mills Road.

Date(s) of site visit(s): 9/12/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: Perennial Floodplain ☒ FEMA ☒

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-131 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: _____

Remarks: Steep slopes on west side of trail, which has created wetlands between the trail and the slopes.

WETLANDS:
☒ YES ☐ NO
Type: All Wooded, Meadow and Emergent

Permanently flooded ☐ YES ☐ NO Depth: _____
Seasonally flooded ☒ YES ☐ NO Depth: N/A
Saturated ☒ YES ☐ NO

Vernal Pools ☒ YES ☐ NO
Drainage Patterns ☒ YES ☐ NO

Remarks: Species: Cat-tail, Joe-pye Weed, Boneset, Sedges and Rushes, Golden Rod, Phragmites - common species

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: %15+

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☒ good ☐ fair ☐ poor

Remarks: _____

_____

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: The mature woods are mostly located on the steep slopes. Trees of 60 years or more -

Species: Maple, Horse Chestnut, Green Ash, Red Oak, Basswood and Black Cherry

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section
Velocity: Slow Shallow ☐ Slow Deep ☐
Fast Shallow ☒ Fast Deep ☒

Pools: ☒ YES ☐ NO Depth: _____
A couple very deep >15 ft.

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☒
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☒ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: A good amount of the stream riparian zones are wetlands.

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____





























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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence #2

Co-occurrence Location: IC-2 is located on both sides of Log Cabin Road and Lower Fishers Road between Benson Road and NYS Route I-90.

Date(s) of site visit(s): 6/3/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☒ I.D:.FA-1, Class 2, 55 Ac Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime:Perennial and Intermittent Floodplain ☒ FEMA ☒

Field Survey

SITE DESCRIPTION:
Co-occurrence Size: ±90 acres

Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Green Ash, Elm, Skunk Cabbage, Phragmites, Cinnamon Fern, Silky Dogwood

Remarks High quality - sensitive fern, cattail, tamarack, royal fern, white pine, great angelica, various sedge species

WETLANDS
☒ YES ☐ NO
Type: Emergent Shrub - Marsh

Permanently flooded ☒ YES ☐ NO Depth: 1-3"
Seasonally flooded ☒ YES ☐ NO Depth: 1-6"
Saturated ☒ YES ☐ NO

Vernal Pools: ☒ YES ☐ NO
Drainage Patterns: ☒ YES ☐ NO
Remarks dead trees - sign of good marsh - great quality; good organic soils.

STEEP SLOPES
☒ YES ☐ NO

Estimated Slopes % 30

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil

Stability ☒ good ☐ fair ☐ poor
Remarks _____

_____

_____

WOODS
☒ YES ☐ NO

Quality ☒ Good ☐ Fair ☐ Poor

Remarks: Tsuga canandensis, bass wood, red maple, red and white oak

_____

STREAM
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☒ Fast Deep ☐

Pools: ☒ YES ☐ NO Depth: 2-6"

Streamside Cover
Along water's edge and stream bank only:
Trees ☐ Bushes, shrubs ☐ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☒ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☐ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☐ Wetland

Quality ☒ good ☐ fair ☐ poor

Floodplain ☒ yes ☐ no
REMARKS: _____

_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management

☐ discharge prevention ☐ other: _____

REMARKS:_____

_____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒NO

☐ Evidence of significant chemical contamination

☐ Evidence of significant levels of dumping

☐ Evidence of significant erosion or sedimentation problems

☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)

☐ Disturbance from roads or highways

☐ Other human disturbance

REMARKS:

_____

_____

_____

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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence #3

Co-occurrence Location: IC-3 is located south of Route I-90 between Fisher Road, and the southwest corner of Wangum Road and Main Street Fishers west towards the Town of Victor limits. A portion of this co-occurrence can be observed from the Auburn Trail.

Date(s) of site visit(s): 6/8/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D._____ Federal ☒
Steep Slopes ☒ some Woods ☒
Streams ☒ Water Regime: Perennial FEMA Floodplain ☒ - Tributary to Irondequoit Creek

Field Survey

SITE DESCRIPTION:
Co-occurrence Size: ±66 acres

Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Willow, Green Ash, Poplar, Sedge Species, Boxwood, Phlox

Remarks Good quality - not very biodiverse

WETLANDS
☒ YES ☐ NO
Type: Meadow and Wooded Wetland

Permanently flooded ☐ YES ☒ NO Depth:
Seasonally flooded ☐ YES ☒ NO Depth:
Saturated ☒ YES ☐ NO

Vernal Pools: ☒ YES ☐ NO
Drainage Patterns: ☒ YES ☐ NO
Remarks: Wetland was observed from the Auburn Trail.

STEEP SLOPES
☒ YES ☐ NO

Estimated Slopes % >15

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil

Stability ☒ good ☐ fair ☐ poor
Remarks: Located along the stream's floodplain, NY State Route 90 and Log Cabin Road. Also located in the woods north of Main Street Fishers.

WOODS
☒ YES ☐ NO

Quality ☐ Good ☒ Fair ☐ Poor

Remarks: Towards southeast along tributary species include: Red and White Oak, Maple Species, Shagbark Hickory, and Ash species

STREAM
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☐ Slow Deep ☒
Fast Shallow ☐ Fast Deep ☒

Pools: ☒ YES ☐ NO Depth: 6-1.5"

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☒ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Quality ☒ good ☐ fair ☐ poor

Floodplain ☒ yes ☐ no
REMARKS:

POTENTIAL STREAM RESTORATION CANDIDATE ☒NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management

☐ discharge prevention ☐ other: _____

REMARKS:_____

_____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒NO

☐ Evidence of significant chemical contamination

☐ Evidence of significant levels of dumping

☐ Evidence of significant erosion or sedimentation problems

☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)

☐ Disturbance from roads or highways

☐ Other human disturbance

REMARKS:

_____

_____

_____







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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence # 4

Co-occurrence Location: IC-4 is located +250 feet West of Strong Road, East of the Town of Victor Limits, ±1,600 feet South of NYS Route 251 (Victor-Mendon Road), and North of Taylor Road -- along an unnamed trout tributary.

Date(s) of site visit(s): 9/12/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☒ I.D. VT-1, Class 2, 17.7 Ac. Federal ☒
Steep Slopes ☐ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:

Co-occurrence Size: +/-26 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Green Ash, American Elm, Spice Bush, Jewelweed, Riverbank Grape

Remarks:

WETLANDS:

☒ YES ☐ NO
Type: Forested

Permanently flooded	☐ YES	☐ NO	Depth: _____
Seasonally flooded	☒ YES	☐ NO	Depth: 0-6"
Saturated	☐ YES	☐ NO	
Vernal Pools	☒ YES	☐ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks: Forested wetland with vernal pools and drainage patterns. Plant species include: Green Ash, Red Maple, Golden Rod and Aster species. Watermarks on the trunk base of the trees.

STEEP SLOPES:
☐ YES ☒ NO

Estimated Slopes: %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: _____

_____

WOODS:
☒ YES ☐ NO

Quality ☐ good ☒ fair ☐ poor

Remarks: Woods are younger - used to be an agricultural field. Tree species include: Green Ash, Red Maple and American Elm.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☒ YES ☐ NO Depth: Shallow 3-6"

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☒
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☒ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: The creek is small and slow moving - not very wide - 3-6' good riparian buffer.

_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____











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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence # 5

Co-occurrence Location: IC-5 is located north of Shire Lane, ±150 feet east of Strong Rd. ±100 feet south of NYS Route 251 (Victor Mendon Road).

Date(s) of site visit(s): 6/7/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☐ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:

Co-occurrence Size: +/-12 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Quaking Aspen, Silky and Grey Dogwoods, Green Ash, Red Maple, and Sensitive Fern, as seen from Shire Lane.

Remarks: This co-occurrence was observed from Shire Lane.

WETLANDS:

☒ YES ☐ NO

Type: Wooded

Permanently flooded	☐ YES	☐ NO	Depth: _____
Seasonally flooded	☒ YES	☐ NO	Depth: _____
Saturated	☒ YES	☐ NO	
Vernal Pools	☐ YES	☐ NO	
Drainage Patterns	☐ YES	☐ NO	

Remarks: Observations could not fully be done due to the lack of access.

STEEP SLOPES:
☐ YES ☒ NO

Estimated Slopes: %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: _____

_____

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: Observations of mature and young trees could be made from the road. Tree species include: Ash, Willow and Poplar.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☐ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☐ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☐ Bushes, shrubs ☐ Tall grasses, ferns, etc. ☐ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☐ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☒ Wetland
Quality ☐ good ☐ fair ☐ poor
Floodplain ☐ yes ☐ no

Remarks: The stream could not be observed due to the lack of access. Mapping indicates the stream runs through a wetland.

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks: Overall this area looks good from observations from the road._____

_____





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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence #6

Co-occurrence Location: IC-6 is located south and east of County Route 42, +1,500 ft. north of Victor Mendon Road.

Date(s) of site visit(s): 6/7/12 By: Tiffany Toukatly/Martin Janda

Mapped Co-occurrences:

Wetlands: State ☐ I.D._____ Federal ☐
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime:_____ Floodplain ☒ FEMA ☐

Field Survey

SITE DESCRIPTION:

Co-occurrence Size: ±_____

Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Maple, Mayapple, Trillium, Red Oak, Sugar Maple, White Ash

Remarks High quality woods with vernal pools and valuable floodplains

WETLANDS

☒ YES ☐ NO
Type: Wooded

Permanently flooded ☐ YES ☐ NO Depth:
Seasonally flooded ☒ YES ☐ NO Depth: 0-5"
Saturated ☐ YES ☐ NO

Vernal Pools: ☒ YES ☐ NO
Drainage Patterns: ☒ YES ☐ NO
Remarks

Wooded wetlands adjacent to the tributary.

STEEP SLOPES
☒ YES ☐ NO

Estimated Slopes %

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil

Stability ☒ good ☐ fair ☐ poor
Remarks _____

_____

_____

WOODS
☒ YES ☐ NO

Quality ☒ Good ☐ Fair ☐ Poor

Remarks: Mature 40-100 years high quality Maple, Red Oak, Beech, Sugar Maple, Basswood, and Hickory.

_____

STREAM
☒ YES ☐ NO C(T)
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☐ Slow Deep ☐
Fast Shallow ☒ Fast Deep ☐

Pools: ☒ YES ☐ NO Depth: 2" - 10"

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☒ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Quality ☒ good ☐ fair ☐ poor

Floodplain ☒ yes ☐ no
REMARKS: rocky bottom - good substrate for fish

_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management

☐ discharge prevention ☐ other: _____

REMARKS: _____

_____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO

☐ Evidence of significant chemical contamination

☐ Evidence of significant levels of dumping

☐ Evidence of significant erosion or sedimentation problems

☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)

☐ Disturbance from roads or highways

☐ Other human disturbance

REMARKS:

_____

_____

_____

















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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence # 7

Co-occurrence Location: IC-7 is located east of Fisher Road, northeast of Benson Road, and west of Interstate 490. This co-occurrence was observed from the public road.

Date(s) of site visit(s): 6/7/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☒ I.D. FA-5, Class 2, 10.7 Ac. Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☐ FEMA ☐

Field Survey:

SITE DESCRIPTION:

Co-occurrence Size: +/-13 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Cat-tail, Black Locust, Green Ash, Maple species, Red Oak

Remarks: Observations of this co-occurrence are made from Benson Road. This co-occurrence is also named Crossmans Pond.

WETLANDS:

☒ YES ☐ NO

Type: Emergent Wetland - Open Water

Permanently flooded	☒ YES	☐ NO	Depth: N/A
Seasonally flooded	☒ YES	☐ NO	Depth: _____
Saturated	☒ YES	☐ NO	
Vernal Pools	☒ YES	☐ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks: This is a kettle lake - or an emergent marsh via NRI report classification.

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: %≥30

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☐ Exposed Soil
Stability ☒ good ☐ fair ☐ poor

Remarks: The steep slopes surround this co-occurrence. Full observations could only be made from Benson Road.

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: The woods were observed from Benson Road.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☒ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☐ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☐ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☒ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☐ yes ☒ no

Remarks:

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____







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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence # 8

Co-occurrence Location: IC-8 is located +1,000 ft. east of Hidden Oaks Drive and adjacent to Benson Road on the west side.

Date(s) of site visit(s): 6/14/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☐ FEMA ☐

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-36 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☐ Herbaceous ☒ Wetland

Dominant Species: Red oak, Witchhazel, Red Maple, White Oak, Tsuga Canandensis

Remarks: Very steep slopes not much of an understory- mostly witch hazel

WETLANDS:
☒ YES ☐ NO
Type: Kettle Lake - Emergent Marsh

Permanently flooded ☒ YES ☐ NO Depth: 1'-6'
Seasonally flooded ☐ YES ☐ NO Depth: _____
Saturated ☐ YES ☐ NO

Vernal Pools ☐ YES ☐ NO
Drainage Patterns ☐ YES ☐ NO

Remarks: Turtles in the Kettle Lakes- Cat-tail march on south end of larger lake

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: %>30%

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☒ good ☐ fair ☐ poor

Remarks: Good old growth forest- 60-80 yrs old

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: Great quality species include: Red Oak, Maple species, Hemlock, Witch Hazel and Spice Bush.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☒ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☐ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☒ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☐ Herbaceous ☐ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☐ yes ☒ no

Remarks: Stream is located at southern area of co-occurrence . Intermittent, Class C, tributary to Irondequoit Creek, receives runoff from adjacent wooded slope areas.

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____



















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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence # 10

Co-occurrence Location: IC-10 is located ±1,000 feet northeast of Victor Heights Parkway, adjacent to NYS Route 251, and south of NYS Route 96 (Victor-Pittsford Road).

Date(s) of site visit(s): 9/12/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☒ I.D. VT-2, Class 2, 216 Ac. Federal ☒
Steep Slopes ☐ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-37 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Silky Dogwood, Cat-tail, Jewelweed, Phragmites, Green Ash, Joe-Pye Weed, Box Elder, Black Willow

Remarks: Wetland is infested with Phragmites, but wetland is great for flood control and water control.

WETLANDS:
☒ YES ☐ NO
Type: Emergent Marsh

Permanently flooded ☒ YES ☐ NO Depth: _____
Seasonally flooded ☒ YES ☐ NO Depth: _____
Saturated ☒ YES ☐ NO

Vernal Pools ☒ YES ☐ NO
Drainage Patterns ☒ YES ☐ NO

Remarks: This wetland is mainly an open meadow or marsh with trees surrounding it. See above for dominant species.

STEEP SLOPES:
☐ YES ☒ NO

Estimated Slopes: %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: _____

_____

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: The wooded area is located towards the northwest where the trees are younger within the wetland. Species include: Red and White Oak, Cottonwood, Green Ash, and Maple species.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☐ Slow Deep ☒
Fast Shallow ☐ Fast Deep ☐

Pools: ☒ YES ☐ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☒ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: The stream runs through the wetland.

_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____









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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence # 11

Co-occurrence Location: IC-11 is South of NYS Route 96, northwest of School Street and running northwesterly under Cork Road and along the south side of NYS Route 251. The Auburn Trail runs through this site.

Date(s) of site visit(s): 9/12/12 By: Tiffany Toukatly & Martin Janda

Mapped Co-occurrences:

Wetlands: State ☒ I.D. VT-2, Class 2, 216 Ac. Federal ☒
Steep Slopes ☐ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-252 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Green Ash, Red Maple, Red Oak, American Elm, Cat-tail, Jewelweed, Skunk Cabbage, Quaking Aspen, Phragmites

Remarks: Great for flood control and water quality. Phragmites has invaded sections of the co-occurrence.

WETLANDS:
☒ YES ☐ NO
Type: Emergent Marsh and Forested Wetland

Permanently flooded	☒ YES	☐ NO	Depth: 0-3'
Seasonally flooded	☒ YES	☐ NO	Depth: _____
Saturated	☒ YES	☐ NO	
Vernal Pools	☒ YES	☐ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks: Large wetland, forested portion has many more wetland plant species - variety. Portions invaded by Phragmites.

STEEP SLOPES:
☐ YES ☒ NO

Estimated Slopes: %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: _____

_____

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: Woods are mature and younger - approximately 10 years and with faster growing species such as Green Ash, Quaking Aspen and others more mature such as Maple species and Oak species.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☐ Slow Deep ☒
Fast Shallow ☐ Fast Deep ☐

Pools: ☒ YES ☐ NO Depth: 0-3'

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☒ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: Stream runs through the wetland

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____





















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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence # 13

Co-occurrence Location: IC-13 is located ±600 feet north of Taylor Road and ±750 feet west of Strong Rd.

Date(s) of site visit(s): 9/12/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-20 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Iron Wood, American Elm, Green Ash, Horse Chestnut

Remarks: Pockets of wetlands within woods - many seeps - nice woods

WETLANDS:
☒ YES ☐ NO
Type: Wooded

Permanently flooded	☐ YES	☐ NO	Depth: _____
Seasonally flooded	☒ YES	☐ NO	Depth: 0-6"
Saturated	☒ YES	☐ NO	
Vernal Pools	☒ YES	☐ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks: Wetlands are on adjacent areas of streams and also pockets within the woods. Soils have high organic content.

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: %15

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☒ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: Younger with some mature species including: Red and Silver Maple, Musclewood, Buckthorn, Black Cherry and Green Ash.

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: Many Iron Wood trees - apple trees as well.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☐ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☐ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☒ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: Some floodplain wetlands.

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____





















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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence # 15 (Modock Rd.)

Co-occurrence Location: IC-15 is located along Modock Road.

Date(s) of site visit(s): 6/14/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☐
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:

Co-occurrence Size: +/-48 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Silky Dogwood, Skunk Cabbage, Green Ash, Red Maple, Cedar, Forget-me-not, Sedge Species, Wool Grass, Yellow Flag

Remarks: Nice wetland - lots of wetland species, organic mucky soil.

WETLANDS:

☒ YES ☐ NO
Type: Emergent Marsh

Permanently flooded	☐ YES	☐ NO	Depth: _____
Seasonally flooded	☒ YES	☐ NO	Depth: 0-7”
Saturated	☒ YES	☐ NO	
Vernal Pools	☒ YES	☐ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks: See above for dominant species. Good quality.

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: % 30

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks There are some slopes exceeding 30% located just outside of the wetland areas. The slopes are wooded.

WOODS:
☒ YES ☐ NO

Quality ☐ good ☒ fair ☐ poor

Remarks: Younger, within wetland - more mature surrounding the wetland.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☒ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☐ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☒ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: Good riparian area within wetland as well.

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____

























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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence # 16

Co-occurrence Location: IC-16 is located east and west of Cork Rd., +1,500 feet south of Rawson Road.

Date(s) of site visit(s): 6/7/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: Intermittent Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-14 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Cat-tail, Grey Dogwood, Green Ash, Phragmites

Remarks: This co-occurrence was observed from Cork Road

WETLANDS:
☒ YES ☐ NO
Type: Emergent Wetland

Permanently flooded	☐ YES	☐ NO	Depth: _____
Seasonally flooded	☒ YES	☐ NO	Depth: N/A
Saturated	☒ YES	☐ NO	
Vernal Pools	☐ YES	☒ NO	
Drainage Patterns	☐ YES	☒ NO	

Remarks: _____

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: %15

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: _____

_____

WOODS:
☒ YES ☐ NO

Quality ☐ good ☐ fair ☐ poor

Remarks: Younger trees, soft woods (Willow, Poplar, Ash)

_____

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☒ Fast Deep ☐

Pools: ☐ YES ☒ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☐ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☒ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: _____

_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____



GANARGUA CREEK

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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Ganargua Creek (GC)
Co-occurrence #1

Co-occurrence Location: +/-400 ft. north of I-90 and +/-500 ft. east of Duck Hollow Dr.

Date(s) of site visit(s): 6/7/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☒ I.D. FA-4 Class 3, 24 ac. Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: Perennial Floodplain ☒ FEMA ☐

Field Survey

SITE DESCRIPTION:
Co-occurrence Size: ±34 acres

Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Willow, Green Ash, Silky Dogwood, Red Osier Dogwood, Sedges Cattail, Silver Maple

Remarks:

WETLANDS
☒ YES ☐ NO
Type: Shrub

Permanently flooded ☒ YES ☐ NO Depth: 3"-2'
Seasonally flooded ☐ YES ☐ NO Depth:
Saturated ☐ YES ☐ NO

Vernal Pools: ☒ YES ☐ NO
Drainage Patterns: ☒ YES ☐ NO

Remarks: Flooded, standing water - bullfrog - redwing blackbird

STEEP SLOPES
☒ YES ☐ NO Adjacent to west and north

Estimated Slopes %10-15%

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☐ Exposed Soil

Stability ☒ good ☐ fair ☐ poor
Remarks wooded

WOODS
☒ YES ☐ NO

Quality ☒ Good ☐ Fair ☐ Poor

Remarks: Horse chestnut, red oak, maple and sugar - bass wood, mature 60 yr. old bass wood

STREAM
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☒
Fast Shallow ☐ Fast Deep ☐

Pools: ☒ YES ☐ NO Depth:

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☒ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Wetland

Quality ☐ good ☐ fair ☐ poor

Floodplain ☒ yes ☐ no
REMARKS:

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management

☐ discharge prevention ☐ other: _____

REMARKS: _____

_____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO

☐ Evidence of significant chemical contamination

☐ Evidence of significant levels of dumping

☐ Evidence of significant erosion or sedimentation problems

☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)

☐ Disturbance from roads or highways

☐ Other human disturbance

REMARKS:

_____

_____





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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Ganargua Creek (GC)
Co-occurrence # 2

Co-occurrence Location: GC-2 is located north of I-90 at the southwest corner of Aldridge Road and County Road 9 intersection. Observations were made from County Rte. 9 and Aldridge Road.

Date(s) of site visit(s): 6/13/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☐ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:

Co-occurrence Size: +/-15 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Cattail, Green Ash, Box Elder, Silky & Grey Dogwood, Willow, Phragmites, Golden Rod

Remarks: Mowed frontage to County Rte. 9

WETLANDS:

☒ YES ☐ NO
Type: Emergent Wetland

Permanently flooded ☒ YES ☐ NO Depth: 1'-2' pond area
Seasonally flooded ☒ YES ☐ NO Depth: 0-10"
Saturated ☒ YES ☐ NO

Vernal Pools ☒ YES ☐ NO
Drainage Patterns ☒ YES ☐ NO

Remarks: Wetland is surrounded with Cat-tail species; observed from the road.

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: Unable to view due to limited access

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: Observations of the woods were from the road. Mature woods.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☒ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☒
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☒ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: _____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks: Mowed frontage along County Rte. 9

_____











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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Ganargua Creek (GC)
Co-occurrence # 3

Co-occurrence Location: GC-3 is located +1,000 feet north of I-90, ±2,000 feet west of Brownsville Road, and south of Gillis Road.

Date(s) of site visit(s): 9/10/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: intermittent Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:

Co-occurrence Size: +/-32 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Sensitive Fern, Green Ash, Red Maple, Hickory, Oak, Jewelweed, Rice Cut Grass, Marsh Marigold

Remarks: Very nice area with mature woods, organic soil and diverse wetlands.

WETLANDS:

☒ YES ☐ NO
Type: Wooded

Permanently flooded	☐ YES	☐ NO	Depth:
Seasonally flooded	☒ YES	☐ NO	Depth: 0-12"
Saturated	☒ YES	☐ NO	
Vernal Pools	☒ YES	☐ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks: Very nice wooded wetlands with tussocks and hummocks indicating inundation. See above for dominant species.

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: %10-15

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☐ Exposed Soil
Stability ☒ good ☐ fair ☐ poor

Remarks: The steep slopes are located within the woods and also outside in the agricultural fields.

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: Nice mature woods. Oak, Hickory and Maple species.

STREAM:
☐ YES ☒ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☐ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☐ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☐ Bushes, shrubs ☐ Tall grasses, ferns, etc. ☐ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☐ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Wetland
Quality ☐ good ☐ fair ☐ poor
Floodplain ☐ yes ☐ no

Remarks: A stream was not located.

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks: _____

_____













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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Sucker Brook (SB)
Co-occurrence # 1

Co-occurrence Location: SB-1 is located south of Boughton Hill Road and west of Route 444.

Date(s) of site visit(s): 6/13/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:

Co-occurrence Size: +/-44 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Basswood, Oak, Red & Sugar Maple, Cinnamon Fern, Musclewood, Green Ash, Red Osier Dogwood, Silky Dogwood

Remarks: Very nice floodplain and nice stream. Southern end has a very nice wetland.

WETLANDS:

☒ YES ☐ NO

Type: Floodplain/Wooded/Marsh

Permanently flooded ☒ YES ☐ NO Depth: 1"-3'
Seasonally flooded ☒ YES ☐ NO Depth: 0"-12'
Saturated ☒ YES ☐ NO

Vernal Pools ☒ YES ☐ NO
Drainage Patterns ☒ YES ☐ NO

Remarks: High quality floodplain and marsh wetland with dead trees, shrubs and wetland sedge/rush/grass species.

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: 15-35%

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☐ Exposed Soil
Stability ☒ good ☐ fair ☐ poor

Remarks: The co-occurrence area includes steep slopes on either side of the floodplain wetland area of the stream. The steep slopes range from 15–35% in several areas.

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: _____

_____

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☒ Fast Deep ☐

Pools: ☒ YES ☐ NO Depth: 6"-12"

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☐ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☒ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☐ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☒ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☐ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: Good quality floodplain.

_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____































WHITE BROOK

BME ASSOCIATES

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Victor NRI
Natural Resource
Field Data Form
WATERSHED: White Brook (WB)
Co-occurrence # 1

Co-occurrence Location: North of Aldridge Rd. +/-200 ft. south of Hackney Creek Dr.

Date(s) of site visit(s): 6/13/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☒ I.D. FA-3, Class 2, 45.5 Ac. Federal ☐
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-69 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Red, Sugar & Silver Maple, Green Ash, Tulip Tree, Skunk Cabbage, Sensitive Fern, May Apple, Reed Canary Grass, American Elm, Witch Hazel, Spicebush

Remarks:

WETLANDS:
☒ YES ☐ NO
Type: Wooded Wetland and Emergent Marsh

Permanently flooded	☒ YES	☐ NO	Depth: 6"-2'
Seasonally flooded	☒ YES	☐ NO	Depth: 0"-2'
Saturated	☒ YES	☐ NO	
Vernal Pools	☒ YES	☐ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks: Skunk cabbage along edge of meadow wetland, monoculture of reed canary and Phragnites at northern end. Wooded wetland has many vernal pools and drainage swales.

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: %10-20%

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☒ Herbaceous ☐ Exposed Soil
Stability ☒ good ☐ fair ☐ poor

Remarks: Gradual slopes within the woods.

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: Many fern species with vernal pools. A lot of spicebush as well. Large maple tree in northern section; also large and old poison ivy on a tree.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☒ YES ☐ NO Depth: 6"

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☒ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: Good stream, cool, good riparian buffer, flows into wetland.

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____













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Victor NRI
Natural Resource
Field Data Form
WATERSHED: White Brook (WB)
Co-occurrence #2

Co-occurrence Location: +/-200 ft. south of Spring Creek Dr., +/-300 ft. north of Falcon's Point Rd. west of Co. Rt. 9

Date(s) of site visit(s): 6/7/12 By: Tiffany Toukatly/Martin Janda

Mapped Co-occurrences:

Wetlands: State ☒ I.D. FA-6 Class 3, 27.1 Ac. Federal ☒
Steep Slopes ☐ Woods ☒
Streams ☒ Water Regime: perennial Floodplain ☒ FEMA ☐

Field Survey

SITE DESCRIPTION:
Co-occurrence Size: ±35 acres

Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Willow, Green Ash, Maples

Remarks: Tributary flowing into wetland from the west - lawn on either side

WETLANDS
☒ YES ☐ NO
Type: Emergent Marsh & Wooded

Permanently flooded ☐ YES ☐ NO Depth:
Seasonally flooded ☒ YES ☐ NO Depth: N/A
Saturated ☒ YES ☐ NO

Vernal Pools: ☒ YES ☐ NO
Drainage Patterns: ☒ YES ☐ NO

Remarks: Nice wetland area - DEC wetland as well.

STEEP SLOPES
☐ YES ☒ NO

Estimated Slopes %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil

Stability ☐ good ☐ fair ☐ poor
Remarks _____
_____
_____

WOODS
☒ YES ☐ NO

Quality ☒ Good ☐ Fair ☐ Poor

Remarks: Oaks, Maples and Ash
_____

STREAM
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☒ NO Depth:

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☐ Lawn ☒
Boulders/rocks ☐ Gravel/sand ☒ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☒ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Quality ☒ good ☐ fair ☐ poor
Floodplain ☐ yes ☐ no

REMARKS: Stream flows to wetland, lawn areas come right up to the stream - a buffer should be placed here to filter any lawn chemicals.

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management

☐ discharge prevention ☐ other: _____

REMARKS: Stream to the west is small

_____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO

☐ Evidence of significant chemical contamination

☐ Evidence of significant levels of dumping

☐ Evidence of significant erosion or sedimentation problems

☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)

☐ Disturbance from roads or highways

☐ Other human disturbance

REMARKS:

Stream buffer to the west.

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Victor NRI
Natural Resource
Field Data Form
WATERSHED: White Brook (WB)
Co-occurrence #3

Co-occurrence Location: WB-3 is located west of Springdale Court, south of Valentown Road.

Date(s) of site visit(s): 6/7/12 By: Tiffany Toukatly/Martin Janda

Mapped Co-occurrences:

Wetlands: State ☐ I.D._____ Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: perennial Floodplain ☒ FEMA ☐

Field Survey

SITE DESCRIPTION:

Co-occurrence Size: ± 42 Acres

Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Skunk Cabbage, Sensitive Fern, Spice Bush, Yellow Birch, Green Ash, Basswood, Red Maple, Jewel Weed

Remarks: Very high quality ecosystems, seeps from groundwater, many well and fingers between the topography

WETLANDS

☒ YES ☐ NO
Type: wooded/shrub-swamp

Permanently flooded ☐ YES ☒ NO Depth:
Seasonally flooded ☒ YES ☐ NO Depth: varies
Saturated ☒ YES ☐ NO

Vernal Pools: ☒ YES ☐ NO
Drainage Patterns: ☒ YES ☐ NO

Remarks: See above for dominant species. Several ground seeps from sloped areas.

STEEP SLOPES
☒ YES ☐ NO

Estimated Slopes %_____

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☐ Exposed Soil

Stability ☒ good ☐ fair ☐ poor
Remarks _____
_____
_____

WOODS
☒ YES ☐ NO

Quality ☒ Good ☐ Fair ☐ Poor

Remarks: Oaks, Hickory, Maple species, Basswood and Cherry._____
_____

STREAM
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section
From: west of Brownsville Rd. To: west of Brownsville Rd. approximately 200 ft.

Velocity: Slow Shallow ☐ Slow Deep ☐
Fast Shallow ☒ Fast Deep ☐

Pools: ☒ YES ☐ NO Depth: 6-8" (12") - some areas

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☒ Gravel/sand ☒ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☐ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☒ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Quality ☒ good ☐ fair ☐ poor

Floodplain ☒ yes ☐ no
REMARKS: _____
_____
_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management

☐ discharge prevention ☐ other: _____

REMARKS:_____

_____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO

☐ Evidence of significant chemical contamination

☐ Evidence of significant levels of dumping

☐ Evidence of significant erosion or sedimentation problems

☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)

☐ Disturbance from roads or highways

☐ Other human disturbance

REMARKS:

_____

_____













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Victor NRI
Natural Resource
Field Data Form
WATERSHED: White Brook (WB)
Co-occurrence #4

Co-occurrence Location: North of Stone Leigh Trail, +/-300 feet east of Victor Egypt Rd.

Date(s) of site visit(s): 6/7/12 By: Tiffany Toukatly/Martin Janda

Mapped Co-occurrences:

Wetlands: State ☐ I.D._____ Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: perennial Floodplain ☒ FEMA ☐

Field Survey

SITE DESCRIPTION:

Co-occurrence Size: ±18 acres

Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☒ Herbaceous ☐ Wetland

Dominant Species: Red Maple, Silver Maple, Green Ash, Cinnamon Fern, Jewelweed, American Beech, Horsetail, American Elm

Remarks: Good forest wetland

WETLANDS

☒ YES ☐ NO
Type: wooded

Permanently flooded ☐ YES ☐ NO Depth:
Seasonally flooded ☒ YES ☐ NO Depth: N/A
Saturated ☒ YES ☐ NO

Vernal Pools: ☒ YES ☐ NO
Drainage Patterns: ☒ YES ☐ NO

Remarks: Organic soils - good quality vernal pools and amphibian habitat.

STEEP SLOPES
☒ YES ☐ NO

Estimated Slopes %10-15

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☐ Exposed Soil

Stability ☒ good ☐ fair ☐ poor
Remarks Steep slopes are located to the north

WOODS
☒ YES ☐ NO

Quality ☒ Good ☐ Fair ☐ Poor

Remarks: Young wooded areas with species of Oak and Maple.

STREAM
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section
From: west of Brownsville Rd. To: west of Brownsville Rd. approximately 200 ft.

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☒ NO Depth:_____

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☒ Gravel/sand ☒ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☐ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☒ Herbaceous ☐ Wetland

Quality ☒ good ☐ fair ☐ poor

Floodplain ☒ yes ☐ no
REMARKS: Good looking stream within the wetland

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management

☐ discharge prevention ☐ other: _____

REMARKS: _____

_____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO

☐ Evidence of significant chemical contamination

☐ Evidence of significant levels of dumping

☐ Evidence of significant erosion or sedimentation problems

☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)

☐ Disturbance from roads or highways

☐ Other human disturbance

REMARKS:

Deer, skunk, red eared slider, female wood duck, good habitat - orchard grass west of trail

_____

_____









GREAT BROOK

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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Great Brook (GB)
Co-occurrence # 1

Co-occurrence Location: +/-1,500 ft. south of Route 96, +/-1,500 ft. west of Brace Rd., north of Ketchum St.

Date(s) of site visit(s): 6/13/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☐ Woods ☒
Streams ☒ Water Regime: _____ FEMA Floodplain ☐

Field Survey:

SITE DESCRIPTION:

Co-occurrence Size: +/-14 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Green Ash, Poison Ivy, Box Elder, Red Maple, Grey Dogwood, Aster & Goldenrod Species

Remarks: Majority of this wetland area has been developed. Baby fawn was seen jumping away.

WETLANDS:

☒ YES ☐ NO

Type: Forest - Successional - Young

Permanently flooded	☐ YES	☒ NO	Depth: _____
Seasonally flooded	☐ YES	☒ NO	Depth: _____
Saturated	☒ YES	☐ NO	
Vernal Pools	☒ YES	☐ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks: Young monoculture of Green Ash.

STEEP SLOPES:
☐ YES ☒ NO

Estimated Slopes: %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: _____

_____

WOODS:
☒ YES ☐ NO

Quality ☐ good ☒ fair ☐ poor

Remarks: Young forest with monoculture of Green Ash. _____

_____

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☒ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☐ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☒ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland
Quality ☐ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: _____

_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____











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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Great Brook (GB)
Co-occurrence # 2

Co-occurrence Location: +/-400 ft. south of Route 96, +/-2,000 ft. west of Brace Rd.

Date(s) of site visit(s): 6/13/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☐ Woods ☒
Streams ☒ Water Regime: _____ FEMA Floodplain ☐

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-13 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Red Maple, Willow, Box Elder, Phragnites, Green Ash, Musclewood

Remarks:

WETLANDS:
☒ YES ☐ NO
Type: Meadow/Emergent

Permanently flooded	☒ YES	☐ NO	Depth: 6"-2'
Seasonally flooded	☒ YES	☐ NO	Depth: 6"-2'
Saturated	☒ YES	☐ NO	
Vernal Pools	☒ YES	☐ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks:

STEEP SLOPES:
☐ YES ☒ NO

Estimated Slopes: %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: _____

_____

WOODS:
☒ YES ☐ NO

Quality ☐ good ☒ fair ☐ poor

Remarks: _____

_____

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section
From: _____ To: _____
Velocity: Slow Shallow ☐ Slow Deep ☒
Fast Shallow ☐ Fast Deep ☒

Pools: ☐ YES ☒ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☐ Tall grasses, ferns, etc. ☐ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☒ YES ☐ NO Severity: High ☐ Medium ☐ Low ☒

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☒ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☐ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: Steep banks with some erosion; 6-7 ft. tall.

_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____











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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Great Brook (GB)
Co-occurrence # 5
PHOTO #____

Co-occurrence Location: GB-3 is located east side of Cork Road and southwest of Cork Road, continuing south of Dryer Road.

Date(s) of site visit(s): 6/17/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. ____ Federal ☒
Steep Slopes ☐ Woods ☒
Streams ☒ Water Regime: ____ FEMA Floodplain ☐

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-22 Ac.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Phragmites, Willow, Poplar, Green Ash, Cat-tail

Remarks: The wetlands of this co-occurrence are small pockets of phragmites and man-made ponds.

WETLANDS:
☒ YES ☐ NO
Type: Emergent Wetland

Permanently flooded	☒ YES	☐ NO	Depth: N/A
Seasonally flooded	☒ YES	☐ NO	Depth: N/A
Saturated	☒ YES	☐ NO	
Vernal Pools	☐ YES	☐ NO	
Drainage Patterns	☐ YES	☐ NO	

Remarks: Observations of wetlands were made from Cork Road - no detailed observations were made.

STEEP SLOPES:
☐ YES ☒ NO

Estimated Slopes: %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: _____

_____

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: The wooded sections of this co-occurrence were in residencies backyards. Access was not available and observations had to be made from the road.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section
From: _____ To: _____
Velocity: Slow Shallow ☐ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☐ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☐ Bushes, shrubs ☐ Tall grasses, ferns, etc. ☐ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☐ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Wetland
Quality ☐ good ☐ fair ☐ poor
Floodplain ☐ yes ☐ no

Remarks: The streams were not able to be observed due to the lack of access.

_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks: This co-occurrence is located within residential developments.

_____









FISH CREEK

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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Fish Creek (FC)
Co-occurrence # 1

Co-occurrence Location: FC-1 is located ±1,200 feet South of Boughton Hill Road (County Road 41). ±1,800 feet. East of Brace Rd. ±2,500 feet Southeast of Brace Road and Boughton Hill Road intersection.

Date(s) of site visit(s): 9/12/12 By: Martin Janda

Mapped Co-occurrences:

Wetlands: State ☐ I.D. N/A Federal ☒
Steep Slopes ☐ Woods ☒
Streams ☒ Water Regime: intermittent FEMA Floodplain ☐

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-13 acres

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☐ Herbaceous ☒ Wetland

Dominant Species: Cottonwood, Black Willow, Silky Dogwood, Red Osier, Sensitive Fern, Cat-tail species

Remarks: Well developed stream corridor protecting stream from adjacent farming activities.

WETLANDS:
☒ YES ☐ NO
Type: _____

Permanently flooded ☐ YES ☐ NO Depth: _____
Seasonally flooded ☒ YES ☐ NO Depth: 6"
Saturated ☒ YES ☐ NO

Vernal Pools ☒ YES ☐ NO
Drainage Patterns ☒ YES ☐ NO

Remarks: Some adjacent wetland depressions to the creek function as vernal pools and flood storage areas.

STEEP SLOPES:
☐ YES ☒ NO

Estimated Slopes: %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: Mostly gradual slopes from adjacent upland areas - small areas steeper.

WOODS:
☒ YES ☐ NO

Quality ☐ good ☒ fair ☐ poor

Remarks: Typical growth of Black Willow/??? within the stream corridors

---

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☒ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☐ Herbaceous ☒ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: _____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____



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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Fish Creek (FC)
Co-occurrence # 3

Co-occurrence Location: FC-3 is located ±4,300 feet south of Boughton Hill Road (County Road 41). ±2,000 feet east of NYS Route 444, ±1,500 feet west of Brace Road, and north of Cherry Street.

Date(s) of site visit(s): 9/10/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: _____ Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-10 acres

%Cover: ☐ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Sugar Maple, Norway Maple, American Elm, Black Cherry, Jewelweed, Joe Pye Weed, Cat-tail

Remarks:

WETLANDS:
☒ YES ☐ NO
Type: Emergent/Meadow

Permanently flooded	☐ YES	☐ NO	Depth: _____
Seasonally flooded	☒ YES	☐ NO	Depth: _____
Saturated	☒ YES	☐ NO	
Vernal Pools	☒ YES	☐ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks: Wetlands are connected by drainage pattern

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: >20%

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: The steep slopes of this co-occurrence are over 20% and are covered with a variety of tree species.

WOODS:
☒ YES ☐ NO

Quality ☐ good ☐ fair ☐ poor

Remarks: Mix of mature and young trees, mostly Maple species

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☒ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☐ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☒ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☐ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☐ Wetland
Quality ☐ good ☒ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: Class C, Intermittent

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____



















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Natural Resource
Field Data Form
WATERSHED: Fish Creek (FC)
Co-occurrence # 4

Co-occurrence Location: FC-4 is located north of Boughton Hill Road and South of Break of Day Road or East Victor Rd.

Date(s) of site visit(s): 9/16/12 By: Martin Janda

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime: perennial FEMA Floodplain ☒

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-_____

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☒ Wetland

Dominant Species: Red Maple, Red Oak

Remarks:

WETLANDS:
☒ YES ☐ NO
Type: part of streambed

Permanently flooded	☐ YES	☐ NO	Depth: _____
Seasonally flooded	☒ YES	☐ NO	Depth: varies
Saturated	☒ YES	☐ NO	
Vernal Pools	☐ YES	☒ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks: Federal wetlands within the creek banks.

STEEP SLOPES:
☒ YES ☐ NO

Estimated Slopes: %15-35

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☒ good ☐ fair ☐ poor

Remarks: Mature forest stabilizes steep banks above the creek. The steep slopes are located above the creek at 15% with some areas over 30%

WOODS:
☒ YES ☐ NO

Quality ☒ good ☐ fair ☐ poor

Remarks: The woods are mature and stabilize the steep banks above the creek's floodplain. Maple species, Red Oak, American Basswood, Hickory species, Cottonwood, and White and Green Ash were observed.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☐ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☒ YES ☐ NO Depth: 12"-18"

Streamside Cover
Along water's edge and stream bank only:
Trees ☒ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☒ (only in small section)
Boulders/rocks ☒ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐
Remarks: Presence of fish and cray fish
STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☒ 25 - 50 ft. ☐ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☐ Herbaceous ☐ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: Upland floodplain within the golf course areas. Some riparian areas with golf course lawn (west side).

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: Stream and adjacent areas stable at the time of the visit.

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks











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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Fish Creek (FC)
Co-occurrence # 5

Co-occurrence Location: FC-5 is located east side of Brace Rd.,± 1,500 feet south of Boughton Hill Road.

Date(s) of site visit(s): 9/12/12 By: Martin Janda

Mapped Co-occurrences:

Wetlands: State ☐ I.D. _____ Federal ☒
Steep Slopes ☐ Woods ☒
Streams ☒ Water Regime: intermittent Floodplain ☒ FEMA ☐

Field Survey:

SITE DESCRIPTION:
Co-occurrence Size: +/-22 acres

%Cover: ☐ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Cat-tail sp., Silky Dogwood, Red Osier Dogwood

Remarks: Large wetland areas with minimum slope

WETLANDS:
☒ YES ☐ NO
Type: Emergent

Permanently flooded	☐ YES	☐ NO	Depth: _____
Seasonally flooded	☒ YES	☐ NO	Depth: _____
Saturated	☒ YES	☐ NO	
Vernal Pools	☐ YES	☒ NO	
Drainage Patterns	☒ YES	☐ NO	

Remarks: Wetlands provide significant flood storage and water quality treatment.

STEEP SLOPES:
☐ YES ☒ NO

Estimated Slopes: %_____

%Cover: ☐ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil
Stability ☐ good ☐ fair ☐ poor

Remarks: _____

_____

WOODS:
☒ YES ☐ NO

Quality ☐ good ☐ fair ☐ poor

Remarks: Generally small softwoods, including Willow species and Green Ash.

STREAM:
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☐ Fast Deep ☐

Pools: ☐ YES ☒ NO Depth: _____

Streamside Cover
Along water's edge and stream bank only:
Trees ☐ Bushes, shrubs ☒ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☒ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☐ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland
Quality ☒ good ☐ fair ☐ poor
Floodplain ☒ yes ☐ no

Remarks: _____

_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒ NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management
☐ discharge prevention ☐ other: _____

Remarks: _____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒ NO
☐ Evidence of significant chemical contamination
☐ Evidence of significant levels of dumping
☐ Evidence of significant erosion or sedimentation problems
☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)
☐ Disturbance from roads or highways
☐ Other human disturbance

Remarks _____

_____









APPENDIX B

RANKING METHODOLOGIES AND EXAMPLES

SECTION 1

RANKING METHODOLOGIES

Section 1

Ranking Methology

The ranking was included in this NRI to help to understand the value of individual natural resources. It gives one an idea of how valuable and complex individual co-occurrences can be. The ranking is not meant to devalue some of the simple or lower quality co-occurrences. The co-occurrences with lower rankings can still have environmental importance.

The ranking system can be applied to other co-occurrences (less than 10 acres) which are not included in this report. It can be used to assess individual natural resources and co-occurrences as follows:

1. First step – Identification of areas of co-occurrence or individual natural resource, and evaluation of these areas:

    a. Review of the co-occurrence map – the map indicates not only the co-occurrences over 10 acres, but also all individual natural resources. Therefore, individual resources in co-occurrences can be identified for any particular site.

    b. Site visit – Conducting a site visit is important in order to verify the presence and quality of individual natural resources. A site visit can also result in the identification of a natural resource which was not mapped. In the last section of this appendix, an example of how "IC-2" was ranked using some information in the data sheet and internet mapping.

2. Second step – Ranking of natural resources on their own, and in co-occurrence with other natural resource features. Typical examples of good and fair quality natural resources are shown in the Figures below. Using the natural resource description and ranking tables on pages 5-8, each natural resource can be evaluated and ranked. Photo examples of natural resources in the next section of this appendix can be helpful with ranking.

    a. Wetlands:
    Generally, wetlands are areas with sufficient water regime to support wetland vegetation. Wetlands can be seasonally or permanently inundated with water, or saturated within the top layer of the soil profile. Seasonal water regime is usually present in winter and spring months. Some wetlands and portions of wetlands can dry up in the summer and early fall, which could be misleading during a site visit at these periods.

    Below are some water regime indicators which can help to identify wetlands:

        A. Visibility of ponding water
        B. Wet soil (muddy or mucky areas)
        C. Water marks on tree trunks (See Figure 2)
        D. Darkened or black (water stained) leaves on the ground
        E. Sediment deposits
        F. Microtopographic Relief (See Figure 1)

Indicators C-F can be helpful when a wetland might not have the visual water regime indicators (A-B) in the late summer to fall months.

Once a wetland has been observed, the type of wetland can be identified and the quality of the wetland can be determined and ranked. (See the table on page 5 which provides description of the different types of wetlands.)

One of the main indicators of a higher quality wetland is a variety of plant species.

Another indicator of a higher quality wetland is the wildlife species which could inhabit the area. For example, a wooded wetland with standing water, fallen trees, leaf debris, and large trees can provide shelter opportunities, and good habitat for amphibian species and water fowl. A monoculture of cattails or invasive species would not have the diversity of habitats for wildlife as a wooded wetland might, so these wetlands would have a lower quality for wildlife.

The table on page 5 describes types of wetlands and how they can be ranked based on their quality.

b. Woods:
The age of the woods can be estimated by tree diameter. Generally trees over 30 years of age are larger than 8" diameter at approximately 4.5' above the ground. The quality of the wooded areas depends on the identified species and on their health. Higher quality woods are those which are mature and mostly mixed hardwoods. Common hardwood species include: Hickory, Oak, Maple and Locust. Common Softwood species include Willow, Cottonwood, and Pine. The health of trees can be assessed by their injuries leading to their degradation and decline (ice storms, winds, etc.) Indicators of woods in poor health includes trees with dying branches (perhaps due to disease, fungus or wildlife), leaf color changes before fall, broken limbs or branches due to ice storms or wind, decaying branches, and dead trees.

c. Streams:
High quality streams are characterized by the diversity of the habitat types which can support wildlife and vegetation. The flow and depth of a stream can give a variety of habitats for wildlife. Some characteristics of a healthy stream includes clear and cool water, pools, riffles, a rocky bottom, diversified vegetated bank slopes, aquatic vegetation, wildlife and invertebrates. Having a wide riparian buffer along either side of the stream will also help in identifying a healthy stream. Impaired streams can be characterized by eroded banks, silted bottoms, low water quality and fewer plants (invasive species, etc.) and absent wildlife and invertebrates.

d. Slopes:
Slopes can be measured using maps or in the field. They can be assessed in the field based on erosion observations and quality of their vegetative cover. The percent of a slope can be estimated by "rise over run".

e. Floodplains:
The significance of the floodplains can be assessed based on the floodplain FEMA maps, local historical information or engineering analysis.

SECTION 2

PHOTO EXAMPLES OF NATURAL RESOURCES

Section 2

Photo Examples of Natural Resources

Forested Wetlands

Figure 1.



This photo indicates a good quality, diverse forested wetland with several plant species (ferns, grasses, mosses and herbaceous plants). This wetland photo also shows microtopographic relief represented by areas of moss elevated in “mounds” indicating seasonal water inundation(flooding) in the areas between them.

Figure 2.



This photo indicates a forested wetland where there is no visualization of standing water or saturated soil. The trees in the photo show dark water marks on the trunks, indicating seasonal ponding. Also in this photo, the ground does not have a lot of vegetation due to seasonal ponding. The trees of this wetland are much older than the trees in figure 1.

Emergent Marsh

Figure 3.



This photo indicates an emergent marsh with open water shallow areas. There are also a wide variety of plants within this emergent marsh. The combination of dryer wetland areas (to the left) with shallow water marsh (center) and open water (to the right) provides diversified habitats. The area is rich in wetland plant species and provides opportunity for wildlife including mammals, amphibians, waterfowl and other birds.

Figure 4.



This photo indicates an emergent marsh with a presence of seasonal inundation and saturation . This is indicated by the dead trees in the background. These trees were not adapted for living in such wet conditions and therefore have died. There is also a variety of plant species within this wetland. The area is rich in wetland plant species and provides opportunity for wildlife including mammals, amphibians, waterfowl and other birds. The shrubs, trees and also dead trees within this wetland gives wildlife a more complex and diversified habitat.

Figure 5.



This photo indicates an emergent marsh with a monoculture of cattails without the high variety of other wetland plant species. This wetland provides limited wildlife opportunities compared with more diverse wetland habitats

Mature Woods

Figure 6.



This photo shows mature woods with the majority trees over 8” in diameter. The ground is only sporadically covered with shade tolerant plants.

Mixed Woods

Figure 7.



This photo shows a mix of tree species as well as aged trees (young and mature).

Young Woods

Figure 8.



This photo shows young trees generally less than 8” in diameter at 4.5’ from the base. Also the ground floor is still covered with fairly dense vegetation.

Streams

Figure 9.



This photo shows a healthy stream with a rocky bottom, good flow and also a good riparian area full of vegetation.

Figure 10.



This photo shows a stream in distress with high, eroded banks (in the back) and muddy water, slow flowing and a silty bottom. This stream looks to be manmade in the past.

SECTION 3

EXAMPLE OF RANKING A CO-OCCURENCE

Section 3

Example of Ranking IC-2

Location: IC-2 is located on both sides of Log Cabin Road and Lower Fishers Road between Benson Road and NYS Route I-90.

This co-occurrence is approximately 90 acres in size and contains several different resources including State and Federal wetlands, streams Class C, C(T) and C (TS), floodplains and woods, as well as steep slopes along the wetland areas. The combination of natural resources makes this site environmentally sensitive and important to protect.

Wetlands
The wetlands within this co-occurrence area are located on both sides of Log Cabin and Lower Fishers Road and total approximately 70 acres. There is a variety of high quality different wetland types including a cedar swamp, emergent wetlands with open water (at the intersection of Log Cabin Road and Lower Fishers Road) and wet meadow. This wide variety of wetlands provides great habitat for wildlife.



Cedar Swamp on the west side of Lower Fisher Road

Woods
The majority of the wetlands are bordered by well-established mature woods on steep slope areas. These woods stabilize the steep areas while providing habitat for a variety of plant and animal species. They serve, along with the wetlands, as a valuable wildlife corridor. The woods are comprised of Musclewood, American Beech, Red Oak, Maple species, etc.

Slopes
There are several wooded steep slopes along the wetlands exceeding 30%.



Wooded steep slope on the east side of Lower Fishers Road
just above high quality wetland.

Streams

There are three major streams within this co-occurrence: Irondequoit Creek and two other tributaries to Irondequoit Creek. These streams fall into the Class C, C(T) and C(TS) NYSDEC classification. The banks of the streams are heavily vegetated and in good condition. The riparian buffer of these streams is generally a high quality wetland floodplain or vegetated upland areas. The Class C stream is a tributary located to the west/northwest of Log Cabin Road; the stream Class C(T) tributary is located south of Lower Fisher Road which continues to flow north under Lower Fishers Road and Log Cabin Road to where it ties into Irondequoit Creek, which is classified as a Class C(TS) stream. These tributaries have a vegetated stream corridor providing for good water quality for trout habitat, including cool temperatures, clean water and a good water flow providing aeration/oxygen needed by trout. These streams are very important as headwaters to Irondequoit Creek. This good quality wetland floodplain produces a rich spectrum of wetland plants. There were crayfish and amphibians observed in both tributaries at the time of the survey. Preservation of the stream corridors is essential for success of trout population and health of the streams.

Floodplain

Most of the co-occurrence area is mapped floodplain by FEMA.

Rating

Resource	**Ranking**
Wetlands	4
Woods	4
Slopes	3
Streams	4
Floodplain	2
Total	**17**

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Victor NRI
Natural Resource
Field Data Form
WATERSHED: Irondequoit Creek (IC)
Co-occurrence #2

Co-occurrence Location: IC-2 is located on both sides of Log Cabin Road and Lower Fishers Road between Benson Road and NYS Route I-90.

Date(s) of site visit(s): 6/3/12 By: Tiffany Toukatly

Mapped Co-occurrences:

Wetlands: State ☒ I.D:.FA-1, Class 2, 55 Ac Federal ☒
Steep Slopes ☒ Woods ☒
Streams ☒ Water Regime:Perennial and Intermittent Floodplain ☒ FEMA ☒

Field Survey

SITE DESCRIPTION:
Co-occurrence Size: ±90 acres

Cover: ☒ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☒ Wetland

Dominant Species: Green Ash, Elm, Skunk Cabbage, Phragmites, Cinnamon Fern, Silky Dogwood

Remarks High quality - sensitive fern, cattail, tamarack, royal fern, white pine, great angelica, various sedge species

WETLANDS
☒ YES ☐ NO
Type: Emergent Shrub - Marsh

Permanently flooded ☒ YES ☐ NO Depth: 1-3"
Seasonally flooded ☒ YES ☐ NO Depth: 1-6"
Saturated ☒ YES ☐ NO

Vernal Pools: ☒ YES ☐ NO
Drainage Patterns: ☒ YES ☐ NO
Remarks dead trees - sign of good marsh - great quality; good organic soils.

STEEP SLOPES
☒ YES ☐ NO

Estimated Slopes % 30

%Cover: ☒ Trees (>20') ☐ Shrubs (<20') ☐ Herbaceous ☐ Exposed Soil

Stability ☒ good ☐ fair ☐ poor
Remarks _____

_____

_____

WOODS
☒ YES ☐ NO

Quality ☒ Good ☐ Fair ☐ Poor

Remarks: Tsuga canandensis, bass wood, red maple, red and white oak

_____

STREAM
☒ YES ☐ NO
STREAMBANK AND CHANNEL CHARACTERISTICS:

Stream Location / Section

Velocity: Slow Shallow ☒ Slow Deep ☐
Fast Shallow ☒ Fast Deep ☐

Pools: ☒ YES ☐ NO Depth: 2-6"

Streamside Cover
Along water's edge and stream bank only:
Trees ☐ Bushes, shrubs ☐ Tall grasses, ferns, etc. ☒ Lawn ☐
Boulders/rocks ☐ Gravel/sand ☐ Bare soil ☐ Pavement, structures ☐

Erosion: ☐ YES ☒ NO Severity: High ☐ Medium ☐ Low ☐

STREAM RIPARIAN AREAS
EXISTING RIPARIAN WIDTH:

☐ ≥25 ft. ☐ 25 - 50 ft. ☒ 50 - 75 ft. ☐ 75 - 100 ft. ☐ >100 ft.

%Cover: ☐ Trees (>20') ☒ Shrubs (<20') ☒ Herbaceous ☐ Wetland

Quality ☒ good ☐ fair ☐ poor

Floodplain ☒ yes ☐ no
REMARKS:_____

_____

POTENTIAL STREAM RESTORATION CANDIDATE ☒NO

☐ storm water retrofit ☐ stream restoration ☐ riparian management

☐ discharge prevention ☐ other: _____

REMARKS:_____

_____

_____

HABITAT DEGRADATION *(Describe degradation and impacts on wildlife habitat on back of sheet)*

☒NO

☐ Evidence of significant chemical contamination

☐ Evidence of significant levels of dumping

☐ Evidence of significant erosion or sedimentation problems

☐ Significant invasion of exotic plans (e.g. purple loosestrife, *Phragmites*, Japanese knotweed)

☐ Disturbance from roads or highways

☐ Other human disturbance

REMARKS:

_____

_____

_____

APPENDIX C

LIST OF PARCELS WITHIN CO-OCCURRENCE AREAS

List of Parcels within Co-Occurrence areas

		Tax ID	Address	City, State ZIP
IC-1	1	5.01-1-5.000	8049 Barony Woods	Pittsford, NY 14534
	2	5.01-1-12.000	197 Whistle Stop Rd.	Pittsford, NY 14534
	3	5.01-1-6.000	8053 Barony Woods	Pittsford, NY 14534
	4	5.01-1-7.000	8059 Barony Woods	Pittsford, NY 14534
	5	5.01-1-10.000	201 Whistle Stop Rd.	Pittsford, NY 14534
	6	5.01-1-14.000	199 Whistle Stop Rd.	Pittsford, NY 14534
	7	5.01-1-15.000	203 Whistle Stop Rd.	Pittsford, NY 14534
	8	5.01-1-37.000	126 Ayrault Rd	Fairport, NY 14450
	9	5.02-3-20.000/5.02-3-21.000	280 Railroad Mills Rd.	Pittsford, NY 14534
	10	5.02-3-25.000	330 Fisher Rd.	Pittsford, NY 14534
	11	5.02-2-13.100	392 Fisher Circle Rd.	Pittsford, NY 14534
	12	5.02-2-38.000	432 Fisher Rd.	Fishers, NY 14453
	13	5.02-2-12.111	396 Fisher Circle Rd.	Fishers, NY 14453
IC-2	1	6.01-1-39.000	7730 Lower Fisher Rd.	Victor, NY 14564
	2	6.01-1-32.000	5236 Dunton Rd.	Middlesex, NY 14507
	3	6.01-1-35.000	7738 Lower Fishers Rd.	Victor, NY 14564
	4	6.01-1-41.100	7753 Lower Fisher Rd.	Fishers, NY 14453
	5	6.01-1-36.000	468 Log Cabin Rd.	Fishers, NY 14453
	6	6.01-1-34.000	406 Log Cabin Rd.	Victor, NY 14453
	7	5.02-2-25.000	195 New Karner Rd., Ste 200	Albany, NY 12205
	8	15.01-1-19.00	384 Log Cabin Rd.	Victor, NY 14564
	9	6.01-1-30.000	366 Log Cabin Rd.	Fishers, NY 14453
	10	6.01-1-29.1	236 Benson Rd.	Victor, NY 14564
	11	6.01-1-31.000/6.01-1-31.200	355 Log Cabin Rd.	Victor, NY 14564
	12	6.01-1-11.000	340 Thornebush Dr.	Victor, NY 14564
	13	5.02-2-26.000/ 5.02-2-27.000	395 Fisher Rd.	Pittsford, NY 14534
	14	5.02-2-29.000	427 Fisher Rd.	Pittsford, NY 14534
	15	6.01-1-37.100	465 Log Cabin Rd.	Victor, NY 14564
	16	6.00-1-55.000/ 6.01-1-42.000	399 Lower Fishers Rd	Fishers, NY 14453
	17	6.01-1-2.000	7937 Main St Fishers	Victor, NY 14564
	18	6.01-1-9.000	332 Thornebush Dr.	Victor, NY 14564
	19	6.01-1-10.000	336 Thornebush Dr.	Victor, NY 14564
	20	6.01-1-17.000	7744 Peepers Hollow Dr.	Victor, NY 14564
	21	6.01-1-12.000	344 Thornebush Dr.	Victor, NY 14564
IC-3	1	5.04-1-57.000	511 Fisher Rd.	Fishers, NY 14453
	2	5.04-1-55.200/5.04-1-56.100/5.04-1-55.110	7868 Main St. Fishers	Fishers, NY 14453
	3	5.04-1-45.00	7851 Fowler St.	Fishers, NY 14453
	4	5.04-1-58.000	514 Log Cabin Rd.	Victor, NY 14564
	5	5.04-1-7.000	582 Mill St.	Fishers, NY 14453
	6	5.04-1-5.000	592 Mill St.	Fishers, NY 14453
	7	5.04-1-1.200	565 Fisher Rd.	Fishers, NY 14453
	8	15.01-1-3.000	807 Co Rd 42	Victor, NY 14564
	9	5.04-1-37.000	7878 Fowler St.	Fishers, NY 14453
	10	5.04-1-38.000	7870 Fowler St.	Fishers, NY 14453
	11	5.00-1-65.200	632 Wangum Rd.	Fishers, NY 14453
	12	5.00-1-64.100	7937 Main St Fishers	Fishers, NY 14453
	13	5.00-1-67.111	657 Old Dutch Rd.	Victor, NY 14564

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	14	5.00-1-69.000	8026 Main St Fishers	Victor, NY 14564
	15	5.00-1-68.100	8037 Main St Fishers	Victor, NY 14564
IC-4	1	14.02-1-19.080	7959 Bramwell Park	Victor, NY 14564
	2	14.02-1-19.090	1303 Marsh Rd.	Pittsford, NY 14534
	3	14.02-1-19.160	920 Strong Rd.	Victor, NY 14564
	4	14.02-1-23.000	8045 St. Rte. 251	Victor, NY 14564
IC-5	1	14.02-1-17.000	889 Strong Rd.	Victor, NY 14564
	2	14.02-1-9.000	1142 Mt. Hope Ave.	Rochester, NY 14620
	3	14.02-1-10.230	7942 Shire Lane	Victor, NY 14564
	4	14.02-1-10.020	7947 Shire Lane	Victor, NY 14564
	5	14.02-1-10.030	7945 Shire Lane	Victor, NY 14564
	6	14.02-1-10.040	7943 Shire Lane	Victor, NY 14564
	7	14.02-1-10.220	7940 Shire Lane	Victor, NY 14564
IC-6	1	14.00-1-8.100	735 Wangum Rd	Fishers, NY 14453-0472
	2	14.00-1-19.130	85 High Tech Dr.	Rush, NY 14543
IC-7	1	5.00-1-26.120	286 Richard St.	Rochester, NY 14607
	2	5.00-1-26.110	155 Benson Rd.	Victor, NY 14564
	3	5.00-1-26.200	165 Benson Rd.	Victor, NY 14564
	4	5.01-1-25.006	7850 Royal Woods	Pittsford, NY 14534
IC-8	1	5.02-2-23.061	7869 Hidden Oaks	Pittsford, NY 14534
	2	6.01-1-29.300	156 Mountain View Dr.	Pickens, SC 29671
	3	6.01-1-29.100	236 Benson Rd.	Victor, NY 14564
	4	5.01-1-25.009	207 Royal View	Pittsford, NY 14534
	5	5.02-2-23.070	7870 Hidden Oaks	Pittsford, NY 14534
	6	5.01-1-25.006	7850 Royal Woods	Pittsford, NY 14534
IC-9	1	15.00-2-29.111	7447 St. Rte. 96	Victor, NY 14564
	2	15.00-2-75.200 & 15.00-2-72.120	1950 BHTL Rd., Suite 200	Rochester, NY 14623
	3	15.00-2-21.100 & 15.00-2-21.210	202 Edgerton Dr.	Rochester, NY 14607
	4	15.00-2-22.220	2563 St Rt 21	Canandaigua, NY 14424
	5	15.00-2-22.120	7353 St Rt 96	Victor, NY 14564
	6	15.00-2-15.211/ 15.00-2-17.110	7318 St Rt 251	Victor, NY 14564
IC-10	1	15.00-2-12.000	7424 St Rt 251	Victor, NY 14564
	2	15.00-2-13.000	595 Yellow Mills Rd	Palmyra, NY 14522
IC-11	1	15.03-1-34.061	7631 Hillside Dr.	Victor, NY 14564
	2	15.03-1-34.071	7629 Hillside Dr.	Victor, NY 14564
	3	15.03-1-34.080	7630 Hillside Dr.	Victor, NY 14564
	4	15.03-1-34.090	1039 Oak Ridge Dr.	Victor, NY 14564
	5	15.03-2-24.100	1041 Oak Ridge Dr.	Victor, NY 14564
	6	15.03-2-1.110	910 Oak Ridge Dr.	Victor, NY 14564
	7	15.00-1-2.000	91 Victor Heights Parkway	Victor, NY 14564
	8	15.00-1-3.000	St. Rte. 251	Victor, NY 14564
	9	15.00-1-8.120	7455 St. Route 251	Victor, NY 14564
	10	15.00-1-71.210/55.000/17.000	7275 Rawson Rd.	Victor, NY 14564
	11	15.01-1-29.000	7494 St Rt 251	Victor, NY 14564
	12	15.01-1-28.000	7488 St Rt 251	Victor, NY 14564
	13	15.00-1-4.000	7459 St Rt 251	Victor, NY 14564
	14	15.00-1-5.000	7449 St Rt 251	Victor, NY 14564
	15	15.00-1-6.000	7439 St Rt 251	Victor, NY 14564
	16	15.00-1-7.210	984 Cork Rd	Victor, NY 14564
	17	15.00-1-7.220	980 Cork Rd	Victor, NY 14564
	18	15.00-1-68.000	4630 Co Rd 46	Canandaigua, NY 14424
	19	15.00-1-59.000	2030 N Turnbull Dr	Metairie, LA 70001

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	20	15.00-1-16.130	793 Canning Pkwy	Victor, NY 14564
	21	15.00-1-14.211	4602 Crewe Hall Ln	Waxhaw, NC 28173
	22	15.00-1-14.212	882 Farmington Rd	Macedon, NY 14502
	23	15.03-2-1.200	908 Oak Ridge Dr	Victor, NY 14564
	24	15.03-2-2.000	907 Oak Ridge Dr	Victor, NY 14564
	25	15.03-2-3.000	915 Oak Ridge Dr	Victor, NY 14564
	26	15.03-2-4.000	923 Oak Ridge Dr	Victor, NY 14564
	27	15.03-2-26.000	1055 Oak Ridge Dr	Victor, NY 14564
	28	15.03-1-34.100	7640 Hillside Dr	Victor, NY 14564
	29	16.17-2-54.000 /15.00-1-16.120	332 Thornbush Dr	Victor, NY 14564
	30	28.02-1-50.000	577 East Bluff Dr	Penn Yan, NY 14527
	31	15.00-1-19.111/15.00-1-58.000	577 East Bluff Dr	Penn Yan, NY 14527
	32	16.17-2-55.100/15.00-1-67.000	4958 North Rd	Canandaigua, NY 14424
	33	27.08-1-1.111		Fairport, NY 14450
	34		1668 Creek St	Rochester, NY 14625
	35		793 Canning Pkwy	Victor, NY 14564
	36	15.03-2-25.000	1045 Oak Ridge Dr	Victor, NY 14564
	37	15.00-1-13.100	197 West Main St	Victor, NY 14564
	38	15.01-1-30.000	7500 St Rt 251	Victor, NY 14564
	39	15.03-2-5.000	933 Oak Ridge Dr	Victor, NY 14564
	40	15.00-1-7.100	7433 St Rt 251	Victor, NY 14564
	41	15.00-1-57.000	3 Hathaway Dr	Princeton Junction, NJ 08550
IC-12	1	6.00-1-58.110	2480 Browncroft Blvd.	Rochester, NY 14625
	2	5.04-1-62.000	515 Log Cabin Rd.	Fishers, NY 14453
	3	5.04-1-17.000	551 Log Cabin Rd	Fishers, NY 14453
IC-13	1	14.00-1-43.000	1860 Five Mile Line Rd.	Penfield, NY 14526
	2	26.00-1-3.220	8018 Taylor Rd.	Victor, NY 14564
	3	26.00-1-3.140	7976 Taylor Rd.	Victor, NY 14564
	4	26.00-1-3.230	8008 Taylor Rd.	Victor, NY 14564
	5	26.00-1-3.210	8024 Taylor Rd.	Victor, NY 14564
	6	14.00-1-44.111	998 Strong Rd.	Victor, NY 14564
IC-14	1	6.00-1-60.200	7710 Lower Fishers Rd.	Victor, NY 14564
	2	6.00-1-60.110	7716 Lower Fishers Rd.	Victor, NY 14564
	3	6.00-1-47.161	374 Benson Rd.	Victor, NY 14564
	4	6.00-1-47.151/6.01-1-23.000	304 Benson Rd	Victor, NY 14564
	5	6.00-1-47.121	131 Parrish Rd	Honeoye Falls, NY 14472
IC-15	1	6.00-1-17.100/17.200	461 Benson Rd.	Victor, NY 14564
	2	6.00-1-18.100	461 Benson Rd.	Victor, NY 14564
IC-16	1	27.00-1-47.000	1198 Cork Rd.	Victor, NY 14564
	2	27.02-1-1.000	7741 Modock Rd.	Victor, NY 14564
	3	27.00-1-48.200/48.110	1181 Cork Rd.	Victor, NY 14564
	4		197 West Main St	197 West Main St
GB-1		Village of Victor	60 East Main St	Victor, NY 14564
GB-2		Village of Victor	60 East Main St	Victor, NY 14564
GB-3	1	28.00-1-3.110	_____	Union Hill, NY 14563
	2	16.00-1-43.112	60 Fishers Rd, P.O. Box 593	Fishers, NY 14453
	3	16.00-1-39.000	973 Brownsville Rd.	Victor, NY 14564
GB-4	1	38.00-1-89.110	521 Shadow Hill Way	Victor, NY 14564

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SB-1	1	39.00-1-23.000	1640 St. Rte. 444	Victor, NY 14564
	2	39.00-1-13.111	7181 Co Rd 41	Victor, NY 14564
	3	39.00-1-22.100 39.00-1-22.200 39.00-1-20.100	85 High Tech Dr	Rush, NY 14543
	4	39.00-1-24.111 39.00-1-43.111	7286 Townline Rd	Victor, NY 14564
FC-1	1	40.00-1-20.100	59 Hampshire Lane	Mendon, NY 14506
	2	40.00-1-21.140	1510 Brace Rd.	Victor, NY 14564
	3	40.00-1-22.111	1623 Brace Rd.	Victor, NY 14564
FC-2	1	40.00-1-23.100	6455 County Rd. 41	Victor, NY 14564
FC-3	1	40.00-1-43.000/36.100	1667 St. Rte. 444	Victor, NY 14564
	2	40.00-1-38.00	6832 Cherry St.	Victor, NY 14564
	3	40.00-1-37.112	6756 Cherry St.	Victor, NY 14564
	4	40.00-1-39.000	1949 Studick Rd	Victor, NY 14564
FC-4	1	28.04-1-44.110/28.04-1-44.120/28.04-1-44.200/28.04-1-45.000	6608 Co Rd 41	Victor, NY 14564
	2	28.04-1-46.100	6386 Co Rd 41	Victor, NY 14564
	3	28.04-1-47.000	1476 East Victor Rd	Victor, NY 14564
	4	28.04-1-49.000	1446 East Victor Rd	Victor, NY 14564
	5	28.04-1-44.311	1450 Brace Rd	Victor, NY 14564
	6	28.04-1-29.100	6465 Break Of Day Rd	Victor, NY 14564
	7	28.04-1-28.100	1384 East Victor Rd	Victor, NY 14564
	8	28.04-1-30.110	6475 Break of Day Rd	Victor, NY 14564
FC-5	1	40.00-1-14.000	91 Lysander Dr.	Rochester, NY 14623
	1	40.00-1-21.140	1510 Brace Rd.	Victor, NY 14564
	2	40.00-1-22.111	1623 Brace Rd.	Victor, NY 14564
	3	40.00-1-21.110	1569 Brace Rd	Victor, NY 14564
	4	40.00-1-22.200	1587 Brace Rd	Victor, NY 14564
	5	40.00-1-3.100	1600 Brace Rd	Victor, NY 14564
	6	40.00-1-36.100 40.00-1-43.000	1667 St Rt 444	Victor, NY 14564
FC-6	1	40.00-1-36.200	1714 Brace Rd.	Victor, NY 14564
	2	40.00-1-37.111	6740 Cherry St.	Victor, NY 14564
	3	40.00-1-47.11	6770 Cherry St.	Victor, NY 14564
	4	40.000-1-47.200	6802 Cherry St.	Victor, NY 14564
	5	40.00-1-37.112	6756 Cherry St.	Victor, NY 14564
	6	40.00-1-36.100 40.00-1-43.000	1667 St Rt 444	Victor, NY 14564
	7	40.00-1-34.100	6722 Cherry St	Victor, NY 14564
FC-7	1	40.000-1-32.111	1639 Brace Rd.	Victor, NY 14564
	2	40.00-1-22.111	1623 Brace Rd	Victor, NY 14564
	3	40.00-1-27.120	226 Cecil A Malone Dr	Ithaca, NY 14850
WB-1	1	15.00-2-79.110	301 Exchange Blvd.	Rochester, NY 14608
	2	7.03-1-4.000 7.03-1-6.360 7.03-1-6.370	55 Sullys Trail Ste C	Pittsford, NY 14534
	3	7.03-1-2.270	625 Yale Ct	Victor, NY 14564
	4	7.03-1-2.260	621 Yale Ct	Victor, NY 14564
	5	7.03-1-2.250	615 Yale Ct	Victor, NY 14564
	6	7.03-1-2.240	601 Yale Ct	Victor, NY 14564
	7	7.03-1-2.230	591 Yale Ct	Victor, NY 14564
	8	7.03-1-6.540	6987 Hackney Cir	Victor, NY 14564

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	9	7.03-1-6.530	6985 Hackney Cir	Victor, NY 14564
	10	7.03-1-6.520	6983 Hackney Cir	Victor, NY 14564
	11	7.03-1-6.510	6981 Hackney Cir	Victor, NY 14564
	12	7.03-1-6.500	6979 Hackney Cir	Victor, NY 14564
	13	7.03-1-6.490	6977 Hackney Cir	Victor, NY 14564
	14	7.03-1-6.430	607 Fox Hunt Dr	Victor, NY 14564
	15	7.03-1-6.420	611 Fox Hunt Dr	Victor, NY 14564
	16	7.03-1-6.410	617 Fox Hunt Dr	Victor, NY 14564
	17	7.03-1-6.400	619 Fox Hunt Dr	Victor, NY 14564
	18	7.03-1-6.390	625 Fox Hunt Dr	Victor, NY 14564
	19	7.03-1-6.380	627 Fox Hunt Dr	Victor, NY 14564
WB-2	1	7.0-1-12.00	36 Rte. 88 South	Newark, NY 14513
	2	1.03-1-19.100	6763 Spring Creek Dr.	Victor, NY 14564
	3	1.03-1-19.20	6777 Spring Creek Dr.	Victor, NY 14564
	4	1.03-1-19.30	6795 Spring Creek Dr.	Victor, NY 14564
	5	1.03-1-26.140	6744 Balcens Point	Victor, NY 14564
	6	1.03-1-26.150	6742 Falcons Point	Victor, NY 14564
	7	1.03-1-26.160	6740 Falcons Point	Victor, NY 14564
	8	1.03-1-26.191	6730 Falcons Point	Victor, NY 14564
	9	1.03-1-26.181	6732 Falcons Point	Victor, NY 14564
	10	1.03-1-26.170	6734 Falcons Point	Victor, NY 14564
	11		6747 Falcons Point	Victor, NY 14564
WB-3	1	7.00-1-78.110	350 County Rd. 9	Victor, NY 14564
	2	7.01-1-98.210 7.01-1-98.300	272 Hidden Brook Trl	Victor, NY 14564
	3	7.01-1-98.400 7.01-1-98.110	270 Hidden Brook Trl	Victor, NY 14564
	4	7.01-1-99.110 7.01-5-596.000 7.01-6-699.000	1265 Scottsville Rd	Rochester, NY 14624
	5	1.03-1-34.000	244 Haywood Glen	Victor, NY 14564
	6	1.03-1-35.000	246 Haywood Glen	Victor, NY 14564
	7	1.03-1-36.000	248 Haywood Glen	Victor, NY 14564
	8	1.03-1-37.000	247 Haywood Glen	Victor, NY 14564
	9		243 Haywood Glen	Victor, NY 14564
	10	1.03-1-39.000	243 Haywood Glen	Victor, NY 14564
	11	1.03-1-51.000	6829 Valentown Rd	Victor, NY 14564
	12	1.03-1-50.000	6811 Valentown Rd	Victor, NY 14564
	13	1.03-1-49.300/ 6.04-1-1.110	454 High St	Victor, NY 14564
	14	1.03-1-49.100	242 Co Rd 9	Victor, NY 14564
	15	1.03-1-5.000	6770 Springdale Ct	Victor, NY 14564
	16	1.03-1-6.000	6780 Springdale Ct	Victor, NY 14564
	17	1.03-1-7.000	6790 Springdale Ct	Victor, NY 14564
	18	1.03-1-8.000	6800 Springdale Ct	Victor, NY 14564
	19	1.03-1-12.000/ 7.01-6-613.000	85 Barchan Dune Rise	Victor, NY 14564
	20	1.03-1-9.000	6810 Springdale Ct	Victor, NY 14564
	21	1.03-1-10.000	6821 Springdale Ct	Victor, NY 14564
	22	1.03-1-11.000	6831 Springdale Ct	Victor, NY 14564
WB-4	1	7.00-1-27.112	373 County Rd. 9	Victor, NY 14564
	2	7.00-1-27.120	6363 Main St	Williamsville, NY
	3	7.00-1-90.000	303 Whispering Hills	Victor, NY 14564
	4	7.00-1-88.00	297 Whispering Hills	Victor, NY 14564
	5	7.00-1-89.000	289 Whispering Hills	Victor, NY 14564

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WB-5	1	7.00-1-13.100	127 Blazey Rd.	Victor, NY 14564
	2	7.00-1-14.121	840 Macclesfield Rd.	Furlong, PA
	3&4	7.00-1-93.130/7.00-1-25.120	6482 Bortle Rd.	Victor, NY 14564
	5	7.00-1-17.000	Ryan Rd	Macedon, NY 14502
	6	7.00-1-12.000/7.00-1-93.200	36 Rt 88 South	Newark, NY 14513
	7	7.00-1-25.112 7.00-1-93.110 7.00-1-93.120	201 Blazey Rd	Victor, NY 14564
	8	7.00-1-14.122	189 Blazey Rd	Victor, NY 14564
WB-6	1	16.00-1-54.00	611 County Rte. 9	Victor, NY 14564
	2	16.00-1-53.000	1 Glass Factory Bay Rd	Geneva, NY 14456
	3	16.00-1-12.111	675 Co Rd 9	Victor, NY 14564
	1	15.03-1-88.00	1075 Willis Hill Rd.	Victor, NY 14564
	2	15.03-1-81.00	7785 Modock Rd.	Victor, NY 14564
	3	15.03-1-80.100	7788 Modock Rd.	Victor, NY 14564
	4	15.03-1-80.200	7756 Modock Rd.	Victor, NY 14564
	5	14.00-1-39.2	1017 Willis Hill Rd.	Victor, NY 14564
	6	15.03-1-22.000	(no address)	
	7	27.02-1-1.00	7741 Modock Rd.	Victor, NY 14564
	8	15.03-1-68.00	7747 Modock Rd.	Victor, NY 14564
	9	15.03-1-69.00	7753 Modock Rd.	Victor, NY 14564
WB-7	1	7.00-1-13.20	127 Blazey Rd.	Victor, NY 14564
	2	7.0-1-10.0	6640 Richardson Rd.	Victor, NY 14564
	3	7.0-1-93.11	201 Blazey Rd.	Victor, NY 14564
	4	7.00-1-25.200	6645 Richardson Rd	Victor, NY 14564
	5	1.03-1-20.090	6699 Woodbrooke Rd	Victor, NY 14564
WB-8	1	1.03-1-26.030	6735 Falcons Point	Victor, NY 14564
	2	1.03-1-26.040	6737 Falcons Point	Victor, NY 14564
	3	1.03-1-48.090	6913 Jilian Rise	Victor, NY 14564
	4	1.03-1-48.010	21 Waterworks Lane	Fairport, NY 14450
	5	1.03-1-48.070	2715 Arbor Rd. Extension	Ontario, NY 14519
	6	1.03-1-48.010	21 Waterworks Lane	Fairport, NY 14450
	7	1.03-1-48.040	160 Goshawk Dr.	Victor, NY 14564
	8	1.03-1-26.070	6743 Falcons Point	Victor, NY 14564
	9		6747 Falcons Point	Victor, NY 14564
	10	1.03-1-26.050	6 Cedarwood Dr	Fairport, NY 14450
	11	1.03-1-25.000	142 Co Rd 9	Victor, NY 14564
GC-1	1	16.00-1-16.00	800 Rainbow Run	Victor, NY 14564
	2	16.00-1-55.100	6649 Gillis Rd	Victor, NY 14564
GC-2	1	16.00-1-7.00	826 County Rte. 9	Victor, NY 14564
GC-3	1	16.00-1-58.100	6505 Gillis Rd.	Victor, NY 14564
	2	16.00-1-16.000	800 Rainbow Run	Victor, NY 14564
GC-4	1	7.02-1-64.00	6715 Golf View Rise	Victor, NY 14564
	2	16.00-1-20.300	6381 Gillis Rd.	Victor, NY 14564
GC-5	1	7.00-1-30.110	256 Bowerman Rd.	Farmington, NY 14425