



Rainbow over Ellis Hollow, Town of Dryden (Jakob Markwardt)

Town of Dryden, New York Natural Resources Conservation Plan

**Town of Dryden Conservation Board
2017**

Peter J. Davies (Chair and Editor)
Robert Beck
Steve Bissen
Gian Dodici
Milo Richmond
Nancy Munkęnbeck
Craig Schutt
Charles Smith
Bard Prentiss, Former Member
Dave Weinstein, Planning Board Liaison
Linda Lavine, Town Board Liaison
Erin Bieber, Secretary

November 2017

INDEX

EXECUTIVE SUMMARY	iii
Map of The Town of Dryden.....	v
Conserved Areas in the Town of Dryden	vi
INTRODUCTION: A Conceptual and Philosophical Basis for the Conservation of Natural Resources in The Town of Dryden	1
WATER RESOURCES	5
Water Is Essential	5
Watersheds and Streams.....	5
Floodplains	6
Consequences and Threats from Land Development.....	8
Other Threats	9
General Measures for Water Resource Conservation	9
Conservation Board Recommendations	10
Summary and References.....	11
BIOLOGICAL RESOURCES.....	12
Description of Biological Resources.....	12
Current situation: Descriptions of important ecological communities.....	14
Threats to the Environment and Health.....	16
Recommendations and Proposed Actions for Dryden.....	21
Developing Policy for Biodiversity Conservation	23
Legal Protections	23
Summary and References	24
FARMLAND AND AGRICULTURE	25
Agriculture in Dryden.....	25
Dryden Agriculture Recommendations.....	26
General Measures for Farmland Conservation.....	27
Summary.....	27
RECREATIONAL RESOURCES.....	28
General Goals	28
Existing public recreation opportunities and features in Dryden	28
Trail Map	28
Actions for Conservation and Enhancement of Recreation Resources	30
SCENIC RESOURCES, VIEWSHEDS AND NATURAL AREAS	31
Dryden Views	31
Dryden's Natural Amenities	31
Important Preserves in the Town of Dryden	32
Threats to Viewsheds, Environment, and Mental Well Being:	32
Recommendations:	32
Map of Nature Preserves in the Town of Dryden.....	33
Summary.....	34
Appendix A: Town of Dryden Parks and Trails	35
Appendix B: Notable Biological Species in Dryden.....	37
Plants of Conservation Concern, Dryden, NY	37
Animals of Conservation Concern	40
References	42
Appendix C: A history of the Town of Dryden Conservation board	43

A Natural Resources Conservation Plan for the Town of Dryden Executive Summary

This document was assembled by The Conservation Board of the Town of Dryden, New York <http://dryden.ny.us/board-commission-list/conservation-board/>.

This Natural Resources Conservation Plan (NRCP) for the Town of Dryden is intended to inform and guide Town decision-makers, natural resource managers, and interested citizens. It forms the basis for a vibrant and healthy lifestyle for a diverse and growing community. Cornerstones of the NRCP include sustainable environmental and biological resources leading to an active agriculture, provision for outdoor recreation, and planned development, all of which contribute to long-term economic viability.

- **Natural Resources** signifies the totality of living and non-living components of a defined land area of interest, in this case the Town of Dryden.
- **Conservation** is the management of human use of the biosphere for the sustainable benefit to present generations, while meeting the needs and aspirations of future generations. Thus conservation embraces maintenance, sustainable utilization, preservation, restoration, and enhancement of the natural environment.

We recognize the need to strengthen and focus attention on our land-use planning. Doing so will maintain the rural character of the Town and protect natural areas, while encouraging best farming practices that will preserve the soil, water and natural habitats of the Town of Dryden.

Water

Water is essential to all living organisms and fundamental to all human endeavors and economies. For these reasons, a major goal of this Plan is the conservation of surface waters (streams, marshes, floodplains and the habitats they provide) and groundwater resources. Groundwater supplies much of the Town's drinking water, while surface waters in our streams, ponds, and lakes support fish and wildlife resources, recreation and important recharge and cleansing options for groundwater. Climate change is leading to extreme storm events that will increase the severity of stream bank erosion, siltation, and may reduce the volume of groundwater available from feeder streams. Wetlands, ponds and lakes may likewise be negatively affected by rapid runoff. Any major change in precipitation pattern carries the risk of habitat change, including degradation of habitat quality for aquatic organisms. Potable water is of utmost importance and we must strive to maintain our quality aquatic resources. Conservation measures for the protection of Dryden's water resources include:

- Maintain forests with intact vegetation and limited disturbance to forest floors.
- Establish and maintain effective buffer zones or undisturbed vegetation and soils along streams and other surface waters.
- Preserve and restore wetlands.
- Facilitate groundwater recharge.
- Minimize impervious surfaces and rapid surface runoff, thereby enhancing infiltration into soils.
- Implement best management practices for ditch maintenance and culvert installation.
- Minimize applications of potential polluting substances, such as de-icing salts, pesticides, and fertilizers.
- Prohibit illegal disposal of waste(s) that may be carried into surface or groundwater.

Biological Resources

Dryden possesses a wide variety of important ecological communities with more native species of plants and animals than any other town in Tompkins County. Nature keeps our families healthy, our water supply clean and abundant, and provides habitat for native pollinators. Natural areas are important parts of community character and local quality of life, and provide for recreation and tourism. They can be negatively affected by unregulated development through habitat loss or damage and the introduction of invasive species. Conserving the biological resources contained in "open space" provides a variety of economic benefits. To lessen the threats to biological resources the Town should:

- Maintain landscape connectivity in large, undisturbed contiguous configurations.
- Protect significant landforms and representatives of all ecologically significant habitats.
- Maintain buffer zones around ecologically sensitive areas.
- Encourage sustainable forestry practices and sustainable and wildlife-friendly agricultural practices.
- Work with conservation laws and guidelines to maintain sustainable woodland diversity.
- Allow regulated harvesting of wildlife and timber resources to maintain a sustainable ecosystem.
- Consider environmental concerns in the planning process for new development projects.
- Direct human uses toward the least sensitive areas, minimize alteration of natural features and concentrate new development along existing roads.
- Encourage the planting of native species.
- Heighten local awareness of the importance of conservation.

Farmland and Agriculture

We place a high priority on the support of active farms and the conservation of the best farmland soils to maximize the current and future potential for farming in the Town by:

- Promoting best farming practices that improve soils, conserve water quality and quantity, enhance wildlife habitats, reduce wildlife mortality, and increase resiliency to the effects of climate change.
- Protecting the best farmland soils, and steering development toward poorer agricultural soils.
- Encouraging farmers to participate in county, state and federal programs to manage farm operations in the best possible way to protect and enhance our environment.
- Promoting local food production and markets through:
 - Strategic conservation of working lands and high-quality farmland soils.
 - Partnering with organizations and government to build new infrastructure and marketing services.
 - Offering events and educational programming to foster production and consumption of local agricultural products.

Recreation and Viewshed

Dryden has extensive resources for outdoor recreation. Those activities best suited to Dryden are the ones that take advantage of natural landscapes and cultural features, while protecting intact the resources of conservation concern by:

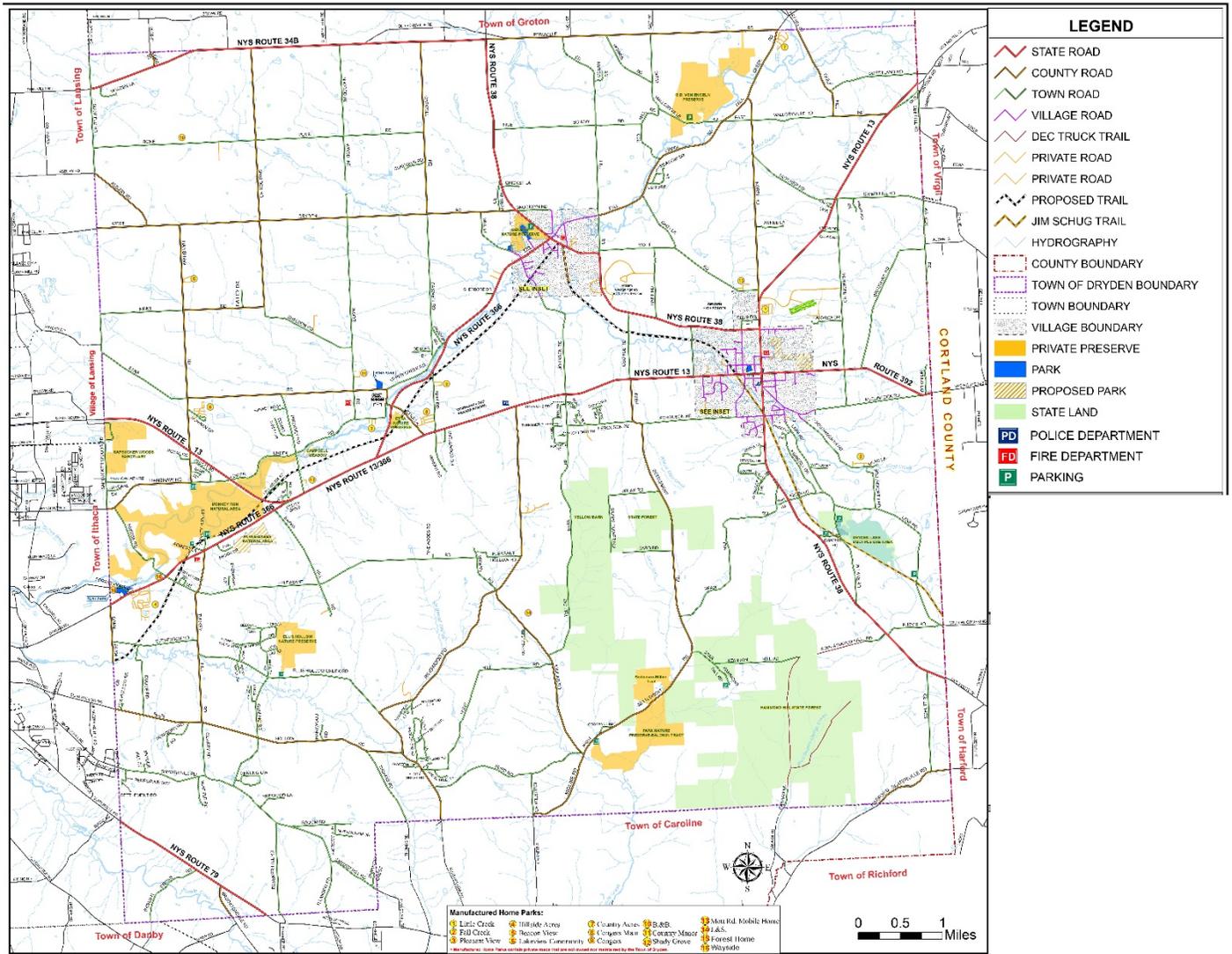
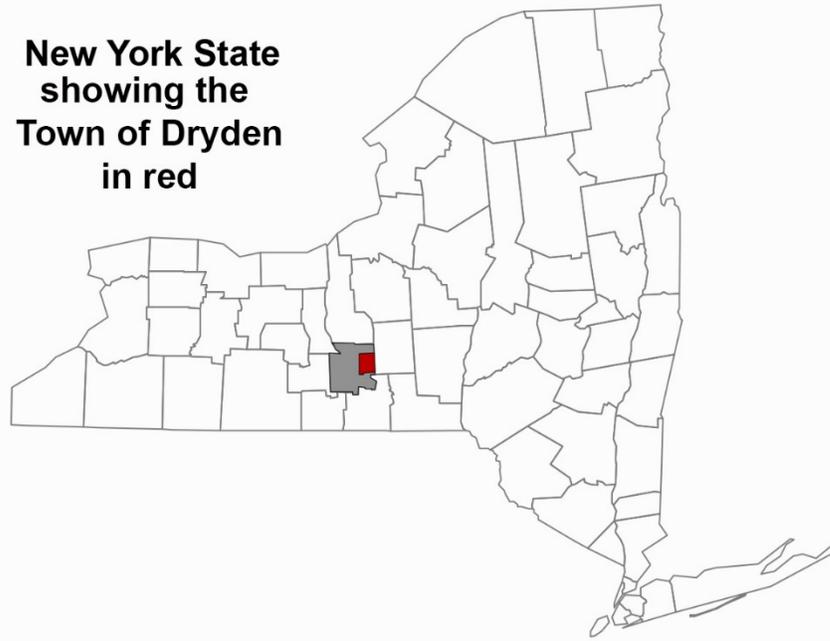
- Working to complete Cayuga Lake's Emerald Necklace, which will incorporate much of what we wish to save in the Town of Dryden as well as certify a contiguous link of natural habitats across a wide region.
- Supporting the completion of the Rail Trail from Dryden Village, through Freeville, Etna and Varna to Game Farm Road in the Town of Ithaca.
- Planning and developing additional walking, hiking and biking trails and trail connections.
- Enhancing the quality and safety of Dryden's roads for biking and walking.
- Developing additional public access sites for fishing and non-motorized boating on Dryden's lake and its streams.

Dryden's visual landscape is central to the history, economy, and culture of the Town. Captivating views appear from numerous vantage points and offer a memorable sense of place for residents and visitors alike. Any future plans should:

- Identify and consider the impacts on important Town viewsheds in the location and design of any new structure or land use within the Town.
- Maintain intact natural areas, hilltops, steep slopes, tree canopy lines, and active farmlands that are visible from public roads wherever possible.
- Endorse Town policies that support working landscapes of farms and forests.

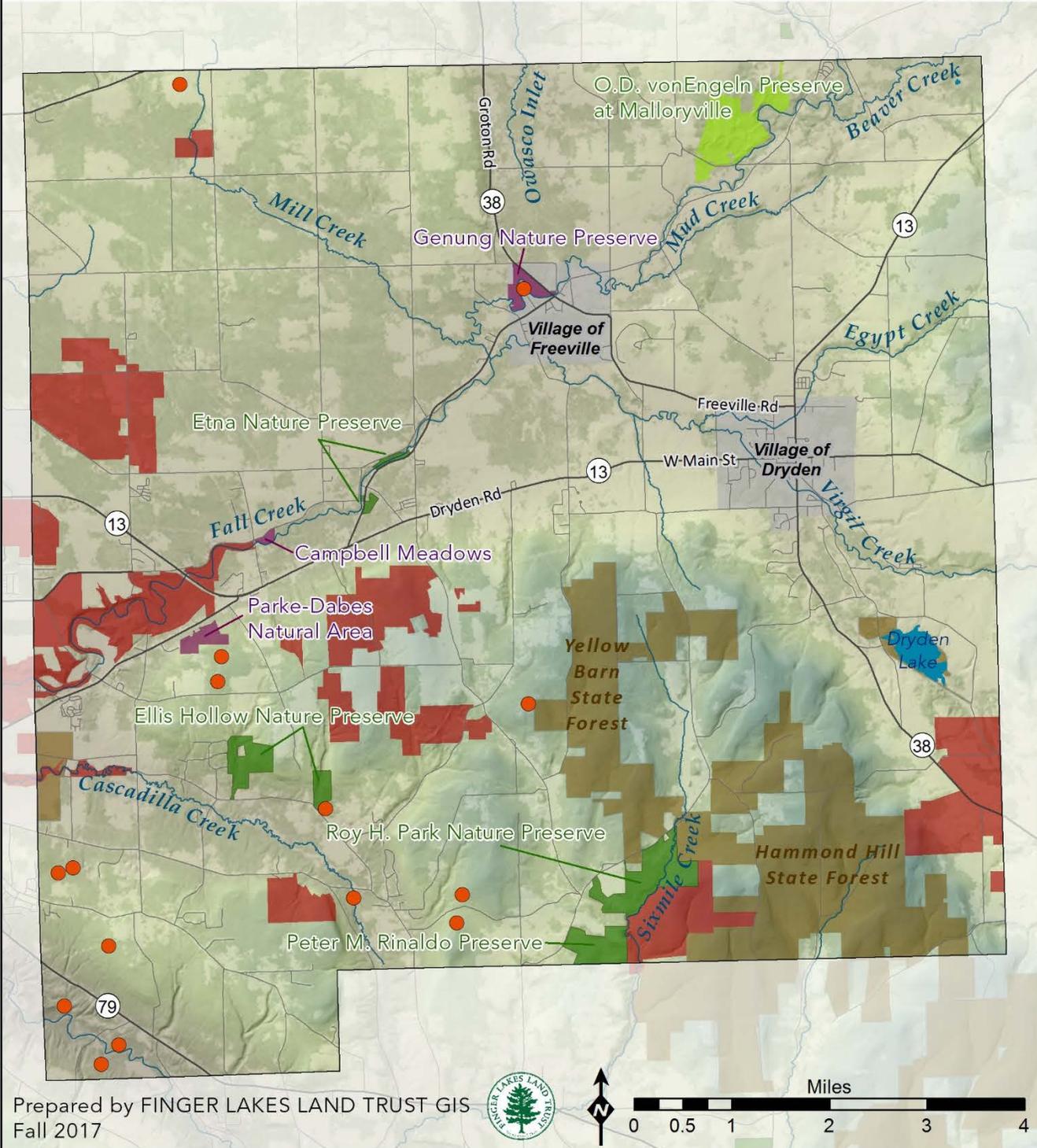
MAP OF THE TOWN OF DRYDEN

New York State
showing the
Town of Dryden
in red



Conserved Lands in the Town of Dryden Tompkins County, NY

-  FLLT Nature Preserves (547 ac)
-  FLLT Easements (955 ac)
-  Cornell University Conserved Lands
-  Municipal Conservation Lands
-  The Nature Conservancy Lands
-  NYS DEC Lands



INTRODUCTION

A CONCEPTUAL AND PHILOSOPHICAL BASIS FOR THE CONSERVATION OF NATURAL RESOURCES IN THE TOWN OF DRYDEN

This *Natural Resources Conservation Plan* for the Town of Dryden is intended to guide and inform natural resource managers, decision-makers, and interested citizens. Planning for conservation of our natural resources, as outlined in this document, forms a basis for sustainable agriculture, outdoor recreation, planned development, and healthy lifestyles, all of which contribute to long-term economic viability. The economic future of the Town of Dryden depends upon wise and effective conservation of all our natural resources in the face of increasing pressures from a diverse and growing population (Figure 1).

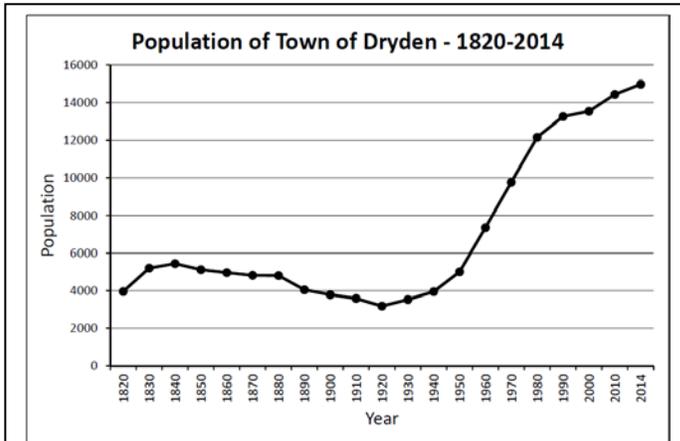


Figure 1. Population growth of the Town of Dryden. Source: Census of Population and Housing: <http://www.census.gov/prod/www/decennial.html> (cited and compiled at https://en.wikipedia.org/wiki/Dryden,_New_York#Demographics)

Increasingly, modern conservation of natural resources applies an ecosystem approach to management of land and human activities to maintain the delivery of ecosystem goods and services (Table 1 and Figure 2) in a long-term, sustainable manner. Human health, well-being, and daily quality of life depend upon healthy ecosystems. To be successful and effective, management and conservation of natural resources must be biologically sound (i.e. based on the best peer-reviewed science available), economically viable, socially and politically acceptable, and ethically sound and responsible. The following actions have been identified as important elements of ecosystem-based management:

1. Identify *measurable* goals and objectives to assess and demonstrate progress.
2. Develop sound ecological models and understanding.
3. Complexity and connectedness are explicitly recognized.
4. The dynamic spatial and temporal nature of ecosystems is acknowledged.

Table 1. Ecosystem goods and services. Healthy ecosystems perform a diverse array of functions that provide both goods and services to humanity. In this context, goods refer to items given monetary value in the market place, whereas the services from ecosystems are valued, but rarely bought or sold.

Ecosystem processes include:
Hydrologic¹ flux and storage
Biological productivity
Biogeochemical cycling and storage
Decomposition
Maintenance of biological diversity

Ecosystem goods include:
Food
Construction materials
Medicinal plants
Wild genes for domestic plants and animals
Tourism and recreation

Ecosystem services include:
Maintaining hydrological cycles
Regulating climate
Cleansing air and water
Maintaining the gaseous composition of the atmosphere
Pollinating crops and other important plants
Generating and maintaining soils
Storing and cycling essential nutrients
Absorbing and detoxifying pollutants
Providing beauty, inspiration, and research

¹: The science of the occurrence, circulation, distribution, and properties of the waters of the earth and its atmosphere
Modified from Christensen, N.L. et al. 1996. The Report of the Ecological Society of America Committee on the Scientific Basis for Ecosystem Management. Ecological Applications 6: 665-691

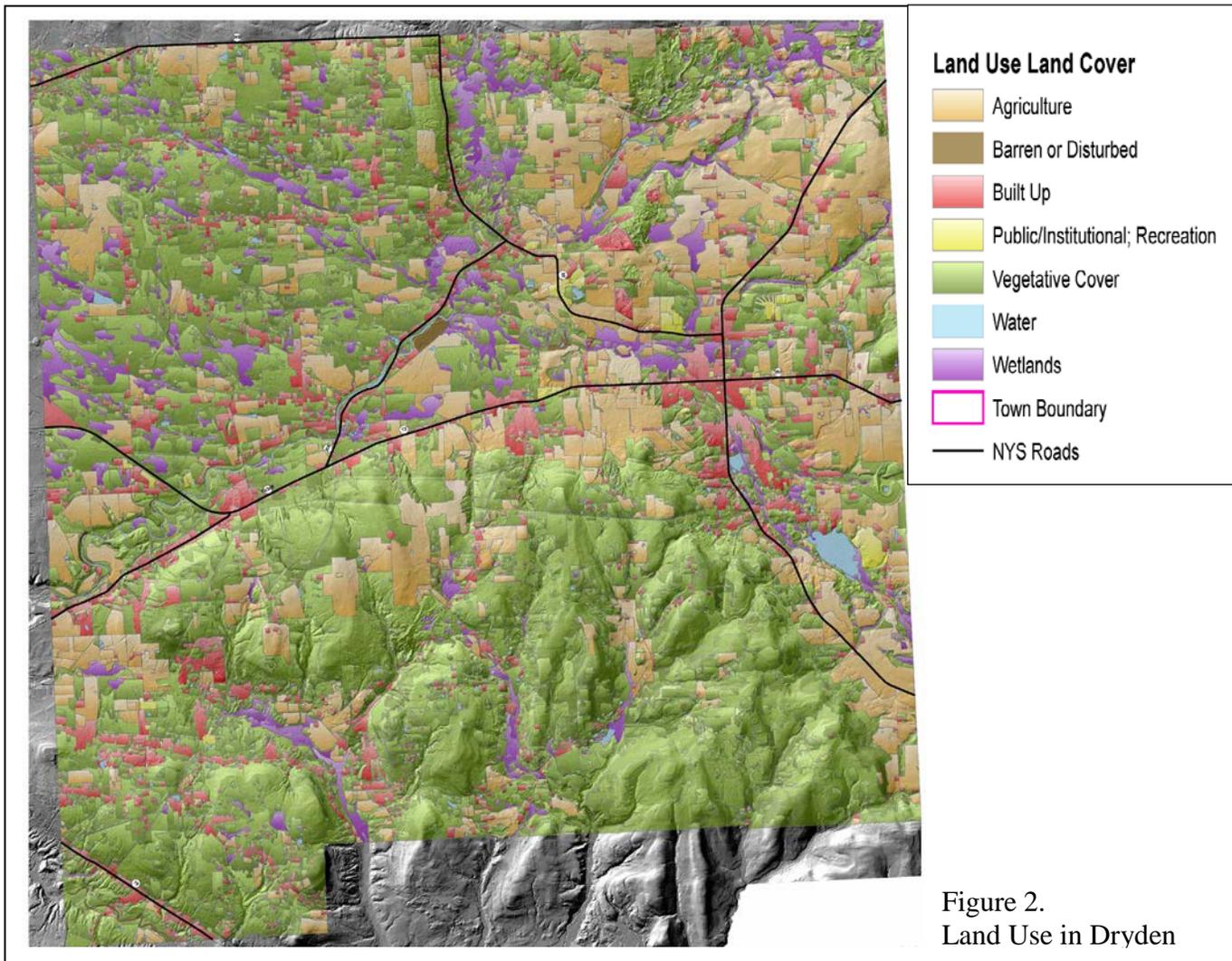


Figure 2.
Land Use in Dryden

5. Spatial and temporal context and scale are considered explicitly.
6. Humans are explicitly considered as ecosystem components.
7. Acceptance of uncertainty and limits to knowledge – knowledge is tentative and subject to revision.
8. Adaptive resource management and *accountability* for actions (requires setting of measurable goals and objectives).
9. Achieve conservation through demonstration, not just proclamation.

Most modern conservation agencies at federal, state, and local levels endeavor to employ science-based, adaptive resource management (Figure 3). Adaptive resource management requires that natural resource managers and conservationists engage in science-based conservation, with full consideration *and* correct interpretation of all the relevant science and factual information.

In the context of this plan, the following definitions may be useful to keep in mind:

Biodiversity - the variety of life, and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.

(From: Final Consensus Report of the Keystone Policy Dialogue on Biological Diversity on Federal Lands, April 1991).

Conservation - The management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations, while maintaining its potential to meet the needs and

aspirations of future generations. Thus conservation is positive, embracing preservation, maintenance, sustainable utilization, restoration, and enhancement of the natural environment¹.

Ecology - the science which encompasses the observation, identification, description, and prediction of patterns and processes related to the distributions and abundances of organisms in time and space.

Ecosystem - Communities of plants and animals (including humans) and their environments, taken together as functional systems of complementary relationships, including the circulation and transfer of energy and matter.

Natural Resources - The totality of living and non-living components of a collection of ecosystems (landscape) or pre-defined land area of interest (e.g. Town of Dryden).

Natural Resource Management - practicing conservation through the application of principles from ecology, economics, and sociology to maintain, monitor, or modify ecological units (populations, communities, ecosystems, or landscapes) to achieve *predictable* results, with a high level of confidence that the predictions will be accurate and the results repeatable.²

Sustainability - An approach to management that does not deny future generations the opportunities and resources we enjoy today.

The Town of Dryden is blessed with a rich variety of plants and animals (biodiversity), and scenic vistas (viewsheds). Many of these resources have been located in an **Open Space Inventory of the Town of Dryden** published in 2003 that can be found at <http://www.dryden.ny.us/Downloads/OpenSpaceInventory.pdf>.

It is the hope of the Conservation Board that decision-makers, both current and future, will be able to appreciate and protect our natural resources for future generations. As Theodore Roosevelt proposed “*The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired, in value.*”

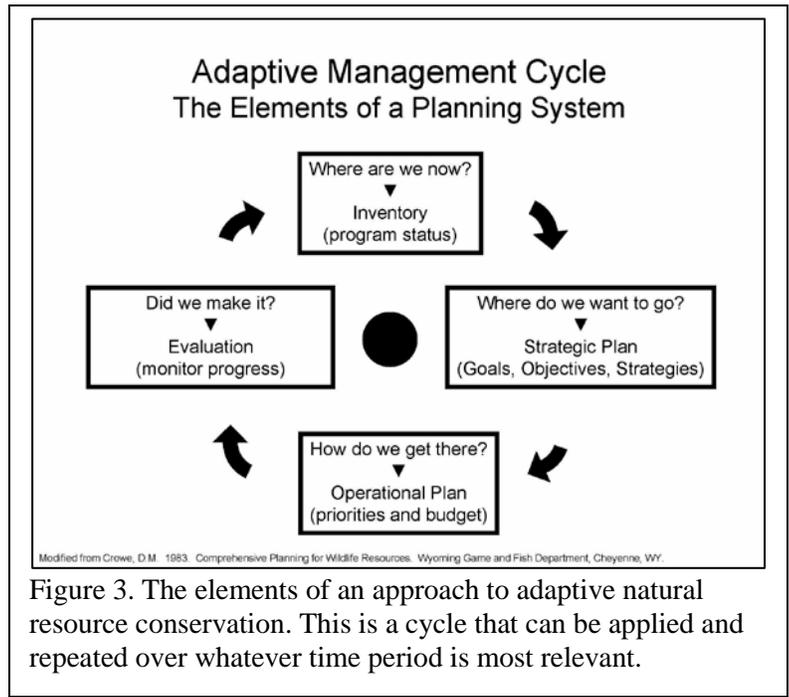


Figure 3. The elements of an approach to adaptive natural resource conservation. This is a cycle that can be applied and repeated over whatever time period is most relevant.



¹ From: McNeely, J.A. et al. 1990. Conserving the World's Biodiversity. International Union for the Conservation of Nature, Gland, Switzerland; World Resources Institute, Conservation International, World Wildlife Fund & the World Bank, Washington, DC. 193 pp.
² https://en.wikipedia.org/wiki/Natural_resource_management

Resources:

The Town of Dryden Conservation Board acknowledges the valued use of the template provided by Town of Ancram (NY) Natural Resources Conservation Plan

www.townofancram.org/images/uploads/CAC/Ancram-NRCP_27-Jan-2015.pdf

Additional online references related to actions of the Conservation Board:

“Open Space Inventory of the Town of Dryden” 15 May 15 2003:

<http://www.dryden.ny.us/Downloads/OpenSpaceInventory.pdf>

“Methods & Selection Criteria for Land Protection and Acquisition” 30 December 2014:

<http://dryden.ny.us/wp-content/uploads/2017/01/Methods-Criteria-for-Land-Protection-12-30-14.pdf> .

**Selected References:**

Grumbine, R.E. 1994. What is ecosystem management? *Conservation Biology* 8(1): 27- 38.

Grumbine, R.E. 1997. Reflections on What is ecosystem management? *Conservation Biology* 11(1): 41-47.

Mills, T.J. T.M. Quigley, and F.J. Everest. 2001. Science-based natural resources management decisions: What are they? *Renewable Resources Journal* 19(2): 10-15.

Whittaker, R.H. 1975. *Communities and Ecosystems*, 2nd ed. Macmillan Publishing Company, New York. 385 pp.

WATER RESOURCES

Water is Essential

The importance of water to the human community and to the natural environment cannot be overstated. Water is essential to all living organisms and fundamental to all human endeavors and economies. For these reasons, a major goal of the Plan is the conservation of surface water and groundwater resources, including volumes, availability, accessibility, and quality of water in streams, wetlands, ponds, lakes, and groundwater. Water is also essential for maintaining viable agriculture in the Town of Dryden.

The quality, flow volumes, and flow patterns of water in a stream, as well as the types and quality of instream habitats depend to a large extent on characteristics of the stream's watershed – the entire land area that drains into the stream. The depth and texture of the soils in the watershed, the depth and quality of organic duff at the soil surface, the kinds of vegetation, the extent of impervious surfaces (e.g., roads, parking lots, roofs), and the configuration of surface water channelization throughout the watershed all influence the volumes and patterns of surface runoff during precipitation and snowmelt events. The degree of water infiltration to the soils, and the water reaching streams, wetlands and ponds throughout the year, depends upon those landscape characteristics.

Watersheds and Streams

A *watershed* is the total land area that drains into a river, stream, pond, or wetland. Dryden encompasses parts of three major watersheds of the Cayuga Lake Basin (Figure 4), and each of these is composed of smaller sub-basins drained by smaller streams. Most of the Town lies in the Fall Creek watershed (to far right of map in the figure), which includes the Virgil Creek drainage that passes through the Village of Dryden. Southeastern and the southern portions of the Town are in the Six-Mile Creek drainage and the central western part of Dryden is in the Cascadilla Creek drainage. A small part in the southeastern portion of the Town drains into the east and west branches of Owego Creek, in the Chesapeake Bay drainage.

Within each watershed a large network of perennial and intermittent streams drains the

Dryden landscape, providing essential water for wildlife and supporting critical in-stream habitat for many plant, vertebrate, and invertebrate species. Perennial streams typically flow continuously throughout years with normal precipitation, but some may dry up during droughts. Intermittent streams flow for variable periods (e.g., a few days, a few weeks, or many months) but typically dry up at some time during the year.

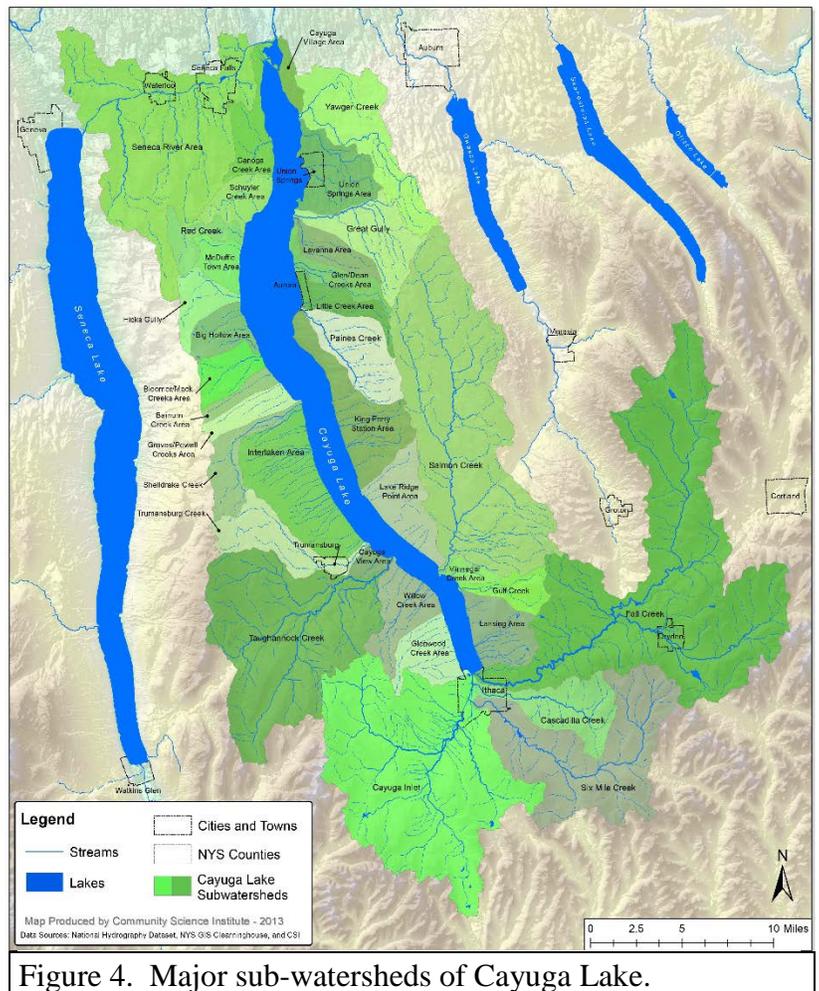


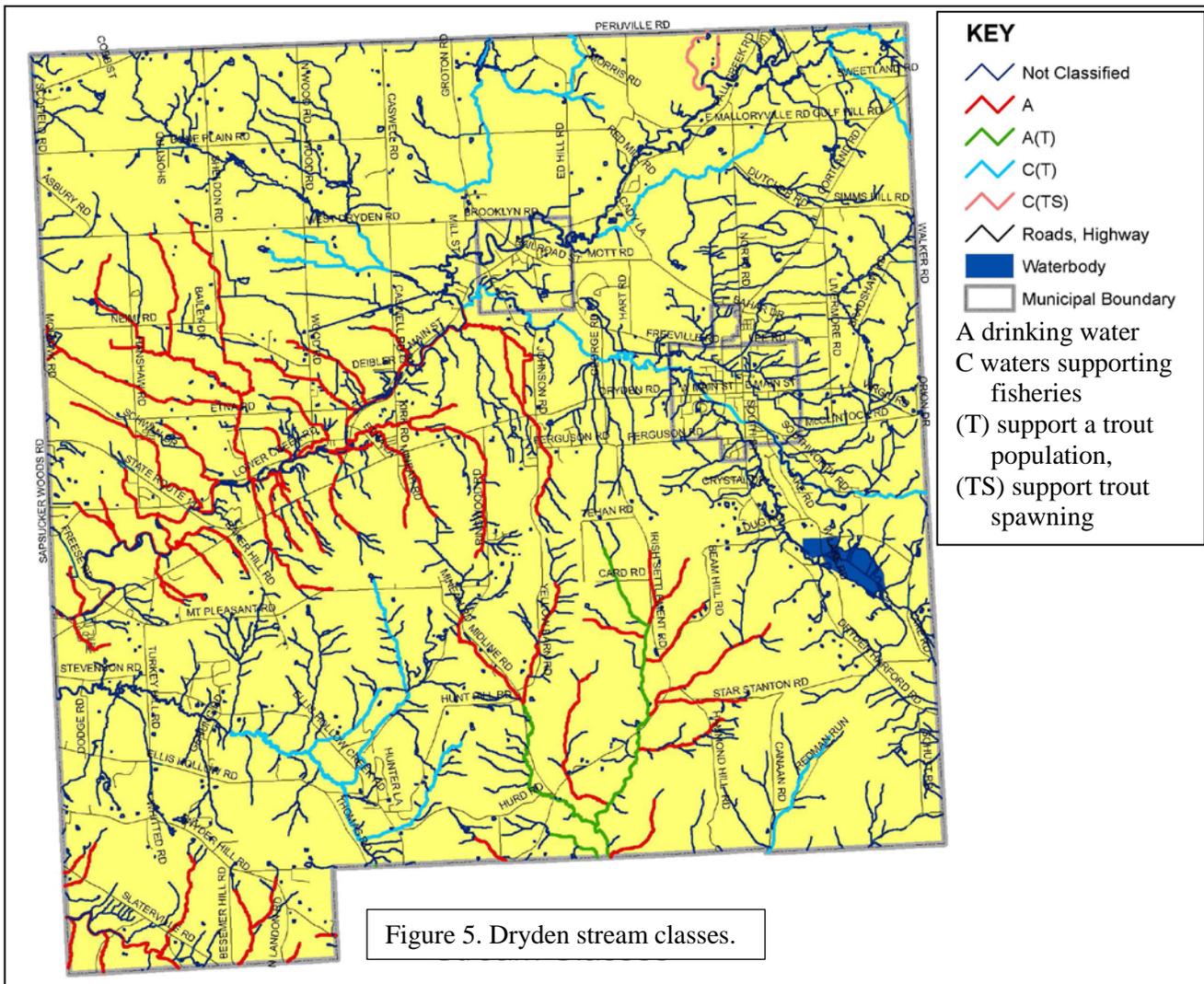
Figure 4. Major sub-watersheds of Cayuga Lake.

Dryden has many high-quality streams (Figure 5), including many that have the clear, cool water and coarse, clean substrates required by brown trout, brook trout, slimy sculpin, and other cool-water fishes, and that are classified by the DEC as trout streams or trout spawning streams. Such streams are a disappearing resource in central New York due to water pollution, stream-bed siltation, removal of forest canopies in the stream corridors, altered stream flows, and other consequences of human activities.



Many of Dryden's small, isolated wetlands without a stream connection lack legal protection from the state or federal government, and are subject to filling, draining, or excavation (e.g., for ponds). Wetlands are sensitive to many of the same threats as streams, such as changes in surface water runoff from the expansion of impervious surfaces, and contamination carried by runoff. Local legislation may be the best way to extend protection to these important and vulnerable habitats. Those small, isolated wetlands provide important habitats for many of the Town's rare plants and animals.

Floodplains: Floodplains are low-lying areas adjacent to streams and rivers and subject to recurring floods. Deep, nutrient-rich sediments make floodplains some of the most fertile and biologically productive areas of the landscape. These areas are especially valuable to wildlife and water resources



when they support intact native plant communities. Protecting intact floodplain habitats can maintain groundwater recharge, reduce the risk of downstream flooding and erosion, increase wildlife habitat resources and connectivity, maintain or improve stream water quality and habitat quality, and support human recreational activities.

The flood zones of major streams shown in Figure 6 are from existing floodplain data from the Federal Emergency Management Agency (FEMA), which have not been updated since 1985. In some areas floodplain extents have likely changed significantly since then, and will continue to change over the coming decades. In Dryden, the largest floodplains are along Fall Creek, and along Virgil Creek in the vicinity of the Village of Freeville. Expansion of development into floodplain areas and the engineered features, such as streamside bulkheads and berms that often accompany such development (to protect property from flood damage) have the effect of isolating streams from their natural floodplains. This loss of connectivity between streams and floodplains reduces the ability of floodwaters to spread out and tends to worsen downstream flood damage to property and infrastructure. Both floodplains and wetlands in Dryden (and in the northeastern U.S. as a whole) are predicted to be flooded more frequently and severely in the future because of climate change, and the horizontal extents of floodplains are predicted to expand. Conserving intact habitats in and near flood-prone areas, and removing engineered features, buildings, and other structures, can help reduce flood damage to property while promoting groundwater (Figure 7) recharge, improving stream health, and providing valuable wildlife habitats.

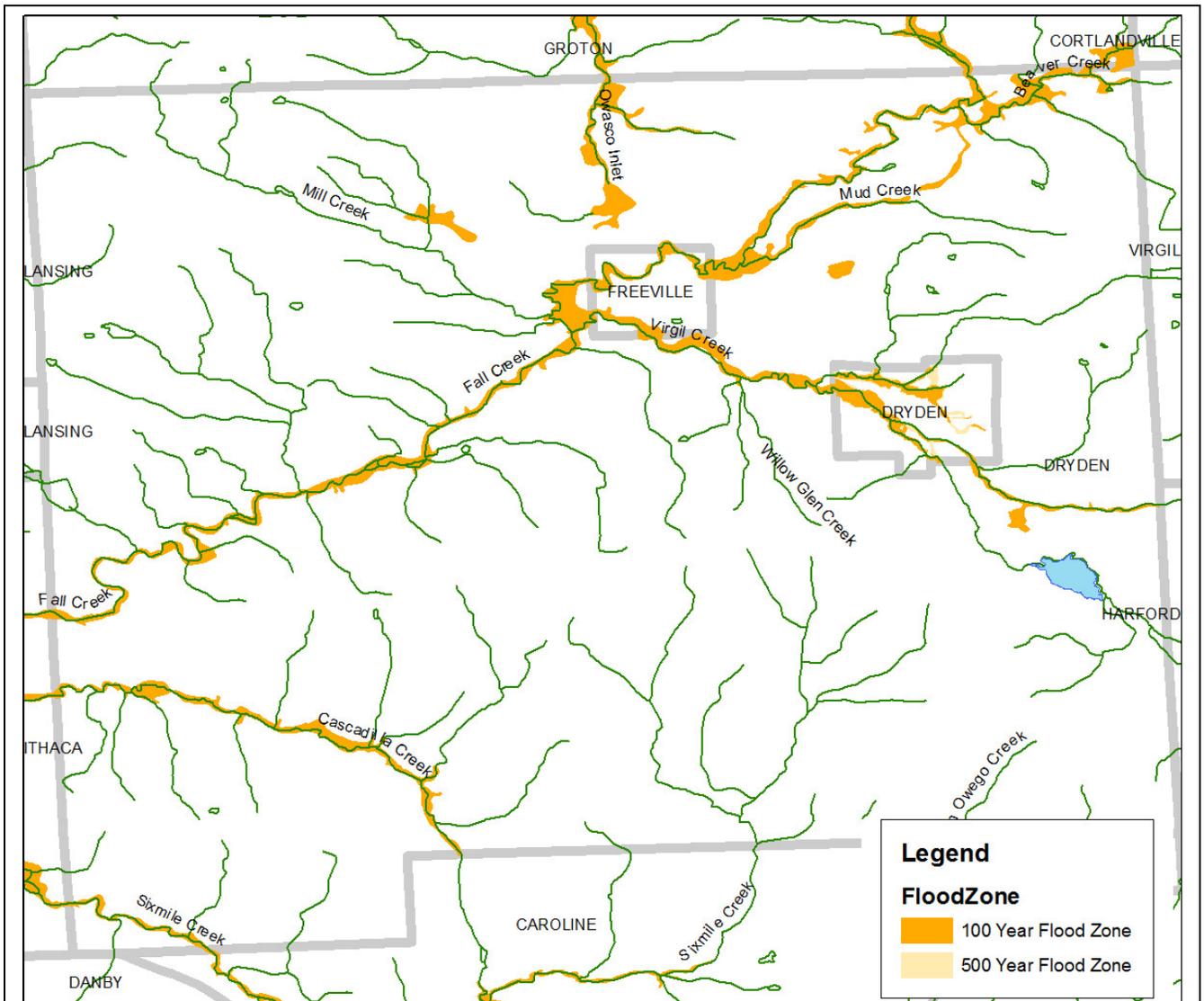


Figure 6. Flood zones in the Town of Dryden.

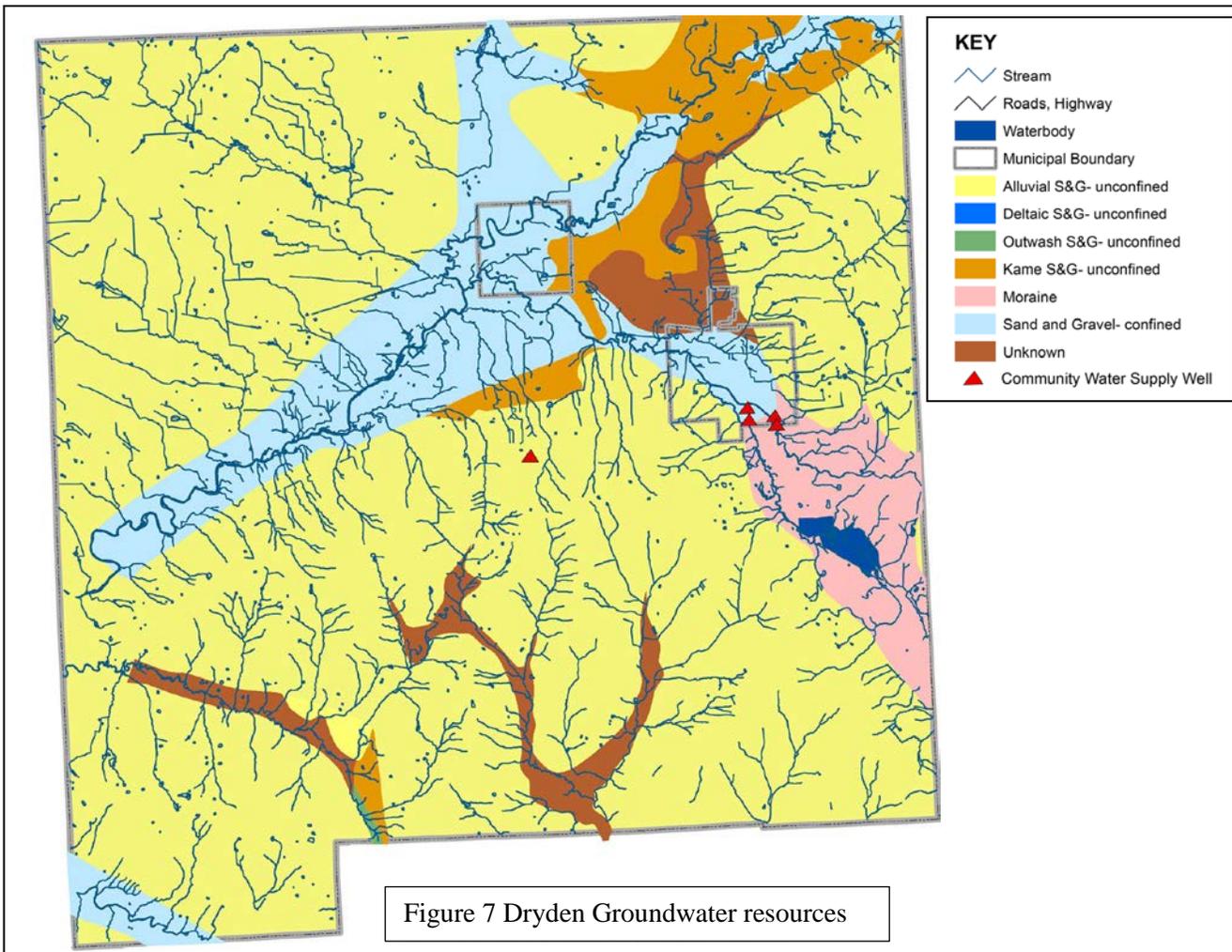
Extreme rainfall events have been occurring more frequently in the Northeast since the 1950s, and the trend is predicted to continue through this century. A storm of a severity that was once considered a 1 in 100 year event is now likely to occur almost twice as often—i.e., once every 50 years (<http://precip.eas.cornell.edu/>; Milly et al., 2008). Likewise, storms of a severity that in the past occurred once in 25 years, on average, might now occur once in 12-13 years. The trajectory of storm severity and frequency suggests that flood projections may be revised upward in the coming decades.

We have experienced increasing frequency and intensity of extreme storm events in this region, and climate scientists predict that trend to continue in response to a changing climate. These conditions are likely to increase the severity of streambank erosion and siltation, reduce the volumes of groundwater available to feed Dryden’s streams, wetlands, lakes, and drinking water wells, and degrade the instream habitat quality for sensitive species of fishes, amphibians, invertebrates, and other organisms.



Consequences and Threats from Land Development

One of the unfortunate consequences of land development with roads, driveways, parking lots, buildings, and other structures is that, unless carefully designed to promote onsite water infiltration to the soils, the movement of water overland and through the soils is dramatically altered. In



conventional designs, precipitation is directed to run rapidly off the ground surface into the nearest ditch or stream. The typical consequences are that the infiltration of rainwater and snowmelt to the soils is reduced or eliminated, groundwater recharge is reduced, soil is eroded and lost, stream flooding is increased, base flows of streams are reduced, and water quality of streams, lakes, and ponds is degraded. All of these changes have the potential to affect agriculture negatively.

Clearing vegetation, grading roadside ditches, and disturbing soils on steep slopes or in areas of shallow soils (e.g., during road, driveway, or house construction) often leads to rapid runoff of precipitation and snowmelt, erosion of soils, and destabilization and siltation of nearby streams. The consequences are reduced groundwater recharge, loss of soils, and degradation of stream habitats for fish and other stream organisms. Stormwater management measures employed at development sites are usually inadequate to restore and maintain the patterns, volumes, and quality of surface runoff and groundwater recharge that occurred prior to development.

Roadside ditches are large contributors to the degradation of streams and wetlands. Ditches intercept rainwater and snowmelt from road surfaces and often from much larger watersheds, and convey it rapidly into nearby streams and waterbodies. Road runoff is contaminated with petroleum hydrocarbons, heavy metals, salts, and other toxins, as well as sand from winter road treatments. Unvegetated ditches are especially susceptible to erosion, and carry additional sediments from the eroded banks. Temporary silt barriers (e.g. bales of straw) can be used to reduce erosion from newly graded ditches before they are revegetated.

Other Threats

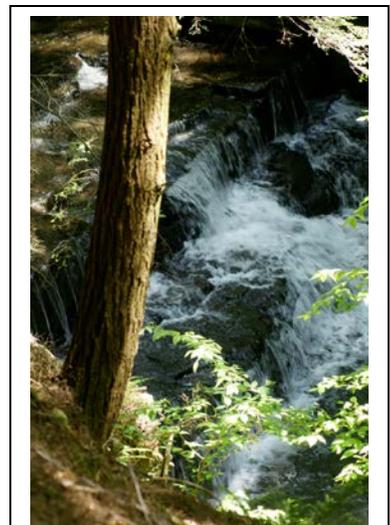
Groundwater is vulnerable to point and non-point source pollution (e.g., from applications of polluting substances to the land), to over-extraction (e.g., from geographically concentrated wells) and to the expansion of impervious surfaces preventing groundwater and recharge. Significant potential sources of groundwater contamination in Dryden are wastewater discharges (e.g., from crowded, failing, or institutional septic systems), and agriculture. Unfortunately, a small volume of a harmful substance can contaminate a large volume of groundwater and, once contaminated, groundwater can be very difficult and costly to clean up.

Applications of fertilizers and pesticides to agricultural fields, lawns, and gardens can degrade the water quality of groundwater and streams, and alter the biological communities of streams, wetlands, and ponds. Leachate from failing septic systems often introduce elevated levels of nutrients, especially phosphorus and nitrogen compounds, into streams, lakes, and ponds, leading to a cascade of effects on the water chemistry, biota, and whole aquatic ecosystem. Removal of shade-providing vegetation along a stream or lakeshore for landscaping or other purposes can lead to elevated water temperatures and have severe negative effects on the aquatic invertebrate, amphibian, and fish communities that depend on cool environments. Vegetation clearing in the floodplain can also reduce the important exchange of nutrients and organic materials between the stream and the floodplain and diminish the capacity for flood attenuation.

For these reasons, and because most Dryden residents and businesses obtain their drinking water from groundwater wells, the quality and quantity of Dryden's groundwater should be of paramount concern to the Town.

General Measures for Water Resource Conservation

- Throughout the landscape, maintain forests with intact vegetation and undisturbed forest floors wherever possible.



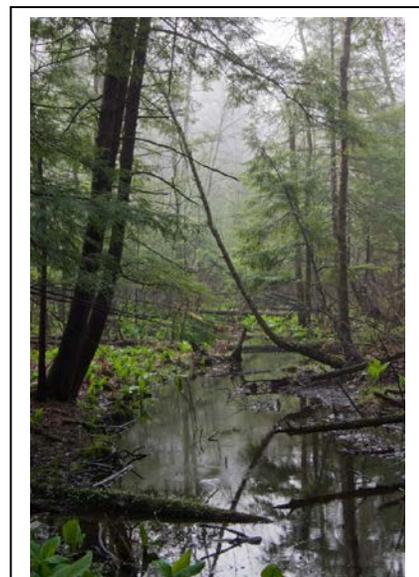
Upper 6 mile creek, Roy H. Park Nature Preserve-Baldwin Tract.
Bard Prentiss

- Protect wetlands and streams from disturbance, and establish and maintain broad buffer zones of undisturbed vegetation and soils along streams, and around wetlands, lakes, and ponds.
- Minimize applications of polluting substances, such as de-icing salts to roads, parking lots, and driveways, and pesticides and fertilizers to lawns, gardens, and agricultural fields.
- In areas of high hydrogeologic sensitivity, avoid siting land uses with potential for contaminating soils and water. Educate landowners in these areas about the vulnerability of groundwater resources.
- On development sites, minimize impervious surfaces and manage stormwater in ways that maintain pre-development patterns and volumes of surface runoff and infiltration to the soils.
- Redesign and retrofit roadside ditches and other stormwater systems to maximize water infiltration to the soils, and minimize rapid and direct runoff into streams, ponds, and wetlands.
- Direct runoff from agricultural fields into basins and well-vegetated swales, instead of directly into streams or wetlands to prevent the introduction of excess nutrients and toxins.
- Design new culverts and bridges and retrofit existing ones to accommodate storms of 200-year or 500-year intensity in anticipation of more frequent and severe storms in coming decades.
- Design, install, and retrofit culverts to maintain the continuity of stream gradients and substrates.
- Consider the probable maximum flood (PMF). Probabilities for PMF estimates would be more useful (than traditional recurrence interval analyses) for risk assessments given the uncertainty of climate trends.
- Keep floodplain meadows well-vegetated. Minimize tillage in floodplains; seed immediately after tilling; leave abundant thatch to cover exposed soils; use cover crops in winter.
- Remove structures, pavement, and hazardous materials from floodplains wherever possible.
- In floodplains, wherever possible, shift to resilient land uses that can withstand moderate to severe flooding; for example, parks, ballfields, hiking trails, picnic areas, fishing access sites, pastures, and hayfields.
- Regulate and monitor extractive commercial uses to ensure that water withdrawals from groundwater or surface water sources are at sustainable levels.

Conservation Board Recommendations

The Conservation Board (CB) recommends the establishment and maintenance of a vegetated streamside buffer of at least one-and-one-half channel widths on either side of perennial stream; for example a 50-foot wide channel should have a protected buffer of at least 75 feet on each bank. Furthermore, the CB recommends that the buffer zone be widened as needed at specific locations to accommodate the probable maximum flood floodplain and protect steep slopes, erodible soils, areas of high hydrogeologic sensitivity, important groundwater recharge areas, and contiguous habitat areas of particular sensitivity. Such a buffer zone will help restore and maintain the chemical, physical, and biological integrity of the streams, attenuate downstream flooding, and maintain important wildlife habitats, and corridors for wildlife movement. The justification and specific recommended provisions are outlined in an undated Tompkins County Planning Department Report: *Enhancing Water Resources in Tompkins County: Benefits of Riparian Areas and Stream Buffers*.

The Floodplain Management Regulations of the Federal Emergency Management and Assistance Law establish minimum standards for flood protection but encourage communities to adopt



Spring-fed stream; O.D. von Engeln Preserve at Malloryville. Bob Beck

more restrictive floodplain management regulations than those set forth in the federal law when warranted to better protect people and property from local flood hazards (44 CFR 60.1[d]). For these reasons, the CB recommends that the Town prohibit construction of new buildings, roads, driveways, and other structures in the 200-year (or even 500-year) floodplains of Dryden streams, and encourages the eventual removal of structures, equipment, and materials that could interfere with natural flood dynamics, or create local or downstream hazards if flooded. Stored materials in barns, sheds, garages, and residences in floodplains – including household cleansers, paints, solvents, fuel oil, gasoline, lubricants, antifreeze, pesticides, and fertilizers – can readily contaminate floodwaters and create toxic conditions downstream. Stored equipment and hardware can create dangerous battering and projectile hazards in floodwaters. Under the Community Rating System, insurance premium discounts are available to policy holders in communities that have enacted floodplain management programs that exceed FEMA Standards. The CB recommends that Dryden explore improved standards for floodplain management. Recently adopted floodplain regulations in the Town of Rhinebeck (Dutchess County) could serve as a model. Maintaining suitable land cover, minimizing impervious surfaces, and carefully managing stormwater along roadways and on developed lots can help to minimize, prevent, or even reverse some of the above mentioned trends.

Because nearly all of Dryden residents and businesses obtain their drinking water from individual wells, the quality and quantity of groundwater throughout the Town is of great conservation concern. The most effective means of sustaining groundwater supplies, clear lakes and ponds, and cool, clean streams with stable banks is to maintain substantially forested watersheds, and maintain riparian zones with undisturbed vegetation and soils. Forests with intact canopy, understory, and ground vegetation, and intact forest floors are extremely effective at promoting infiltration of water to the soils, and may be the best insurance for maintaining flow volumes, temperatures, water quality, bank stability, and habitat quality in streams and ponds. Springs and seeps in the watershed are also key to maintaining the cool stream temperatures that are critical to sensitive stream invertebrates, fishes, and amphibians.

Summary

The Town of Dryden should be a place where water resources are clean, safe and protected. Therefore the conservation of clean surface water and ground water for the residents of the Town is a major goal of this Conservation Plan. Much of the Town of Dryden's drinking water is drawn from groundwater and surface water in our creeks and lakes support fish and wildlife resources, recreation and agricultural communities. Some conservation measures that address the protection of clean water include:

- Maintain forests with intact vegetation and undisturbed forest floors wherever possible,
- Establish and maintain broad buffer zones of undisturbed vegetation and soils along streams, and around wetlands, lakes, and ponds,
- Preserve existing wetlands and restore wetland functions.
- Minimize impervious surfaces and manage stormwater in ways that maintain pre-development patterns and volumes of surface runoff and infiltration to the soils,
- Promote groundwater recharge, and
- Minimize applications of potentially polluting substances, such as de-icing salts, pesticides and fertilizers.

References

New York Rural Water Association (undated) Local Source Water Protection and Smart Growth in Rural New York: A guide for Local Officials. <http://nyruralwater.org/sites/all/themes/nywater/pdf/booklet.pdf>
Tompkins County Planning Department Report: Enhancing Water Resources in Tompkins County: Benefits of Riparian Areas and Stream Buffers.
Milly, P.C.D. et al., 2008. Stationarity is Dead: Whither Water Management? Science 319 (5863), 573-574

BIOLOGICAL RESOURCES

Description of Biological Resources

Biological resources, the plants, animals, insects, microorganisms, and the ecosystems in which they reside provide invaluable benefits that support the human community and provide irreplaceable scenic, esthetic, and economic richness to the Town and region. The biological communities and their habitats offer humans such benefits as climate moderation, native pollinators of agricultural crops, and free, long-term maintenance of water resources for agricultural, domestic, and other uses.

Dryden possesses a wide variety of important ecological communities that support a rich variety of species, many of which are locally rare and restricted to a very small set of environmental conditions found in only a few locations in the Town. On the other side of the coin, the large expanses of forests and wetlands found in the Town provide enormous benefits for aquifer recharge, flood abatement, nature study, and recreational activity among other attributes.

Dryden has 57 Unique Natural Areas (UNAs; Figure 8), which are identified as areas that harbor rare or endangered flora and fauna, unique geological features, or contain excellent examples of ecosystems or biotic communities and thus deserve special attention for preservation in their natural state. The Tompkins County Unique Natural Areas (UNA) Survey (2000, currently being updated) contains an inventory of the rare and unique wildlife and plant populations found in the UNAs of Dryden. Within Tompkins County, Dryden has the most acres designated as UNAs of any town. However, UNA preservation is largely voluntary on all private lands at this time. With little tangible protection, education and advocacy are likely the best approaches available to protect these areas.



Why Should We Care about Natural Areas and Wildlife?

Diverse natural ecological systems provide a number of beneficial services to human health and our communities.

- Forests, wetlands, and stream corridors work together to keep our water supply clean and abundant.
- Natural areas and open spaces can provide economic benefit through increased tourism and reduced cost of town services.
- Plants and animals and the intact natural areas that support them are important parts of community character and local quality of life.
- Nature keeps our families healthy by cleaning the air and water, lowering stress, and lessening the risk of disease.
- Protected natural areas and associated wildlife provide vital recreational opportunities.
- Habitat for native pollinators that are essential for important food crops.

Conserving the biological resources contained in “open space” can provide a variety of economic benefits. Protecting centers of natural ecosystems and green spaces can support the local farm economy while conserving woodlands and open fields. Wetland and floodplain conservation can help reduce the impact of flooding and also protect groundwater resources. The aesthetic amenity of open space enhances property values, and biodiversity contributes to regional income from recreation and tourism.

Healthy ecosystems can minimize erosion and sediment accumulation in streams, maintain groundwater resources by



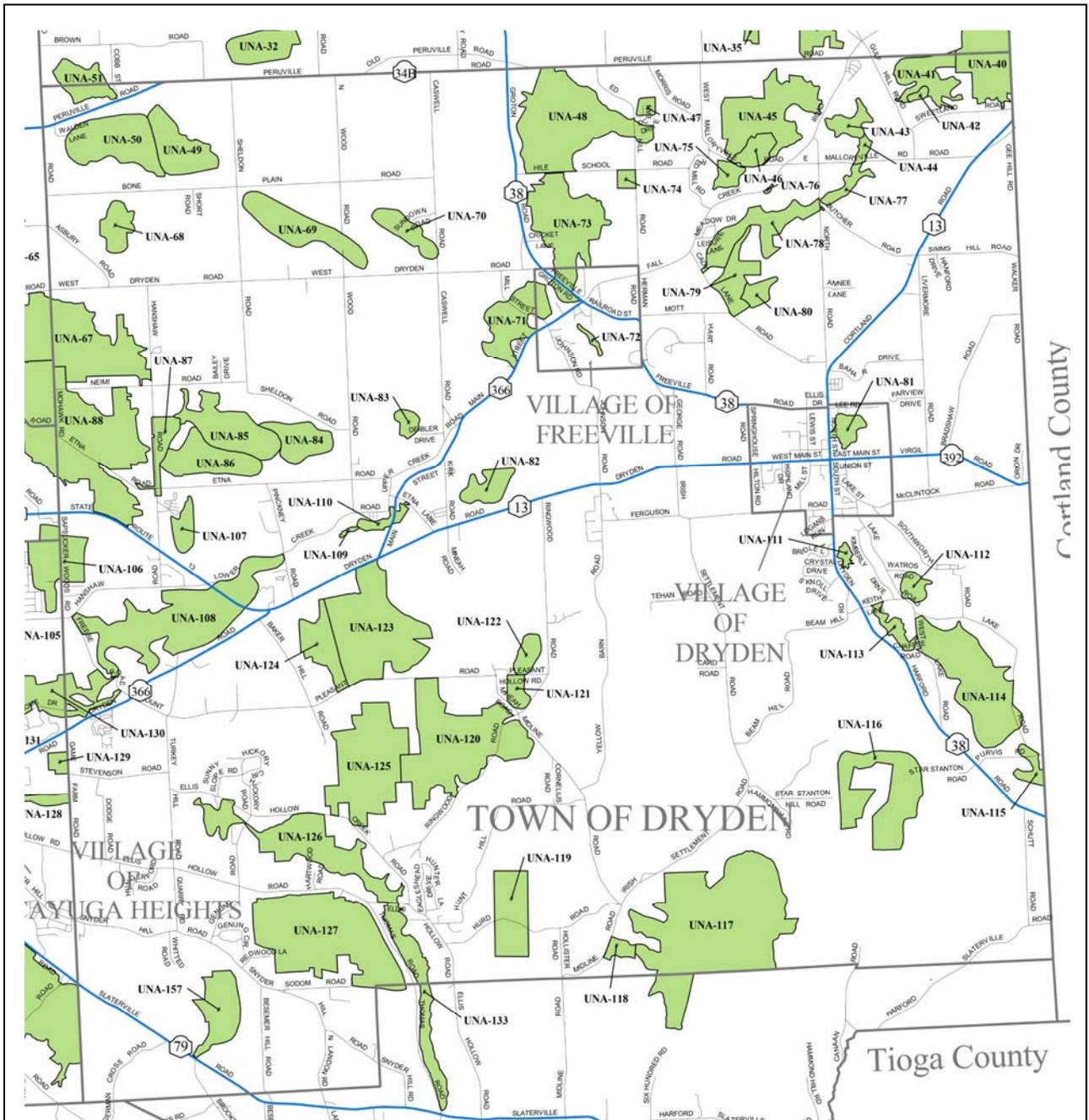


Figure 8. Unique Natural Areas in the Town of Dryden (in green).

protecting aquifer recharge zones, and reduce flooding and highly-variable stream flow associated with denuded or impervious landscapes. Open space and biodiversity conservation does not mean stopping all development. Land development and conservation can work together if development is done thoughtfully. Strategic site design can allow smart development that preserves water quality; conserves soil, vegetation, and biodiversity; and maintains aesthetic values. Smart development strategies also have economic benefits, as they can reduce a community’s liability for things such as road building and maintenance, sewer and water, fire and police.

Areas of greatest biodiversity are frequently those least disturbed by development. Often these remnant undisturbed environments are too steep, wet, or remote for easy access or building. Environments with minimal human activity tend to occur in large blocks of habitat unfragmented by roads or built structures. In Dryden, where forest is the dominant habitat type, it is also useful to identify areas of extensive, contiguous forest (e.g., Hammond Hill and Yellow Barn State Forests), which are most likely to contain abundant core habitat and minimal amounts of human-modified

edge. Wetlands also are frequently areas of high biodiversity: having abundant moisture and sunshine, they can have high biological productivity and can support specialized or rare species. Conservation of these areas of key biodiversity value is one of the important strategies for maintaining overall diversity in our area.

The overall status of species in New York State is shown in Figure 9. Most legal protections, however, focus on less common species. The New York Natural Heritage Program (NYNHP: <http://www.acris.nynhp.org/>), a collaboration of scientists from the DEC and The Nature Conservancy, provides online guides to aid land managers, planners, and others in understanding rare, threatened, and endangered species in New York. NYNHP also provides online guides to the rare or threatened animals, plants, and habitats known to occur in each county in New York.

Dryden has been recognized by the DEC and the New York Natural Heritage Program (NYNHP) as having special importance for rare species of plants and animals and for high-quality examples of ecological communities. In addition, the NYNHP has designated parts of Dryden as “Important Areas” for rare species and natural communities.



Painted Trillium (*Trillium undulatum*), a state-listed, protected Exploitably-Vulnerable native plant of Dryden. Charles Smith

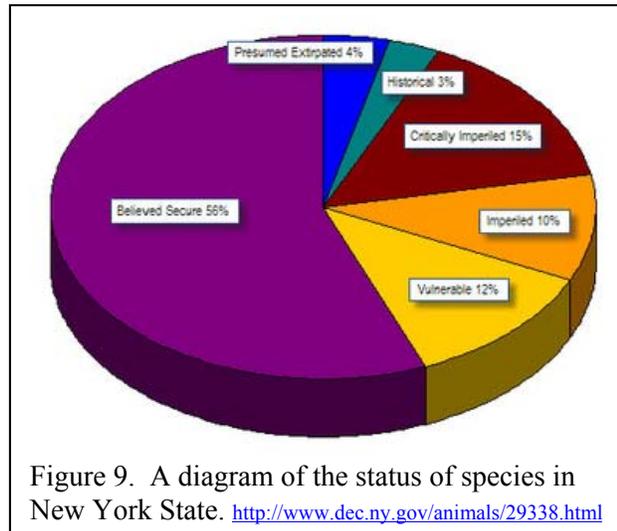
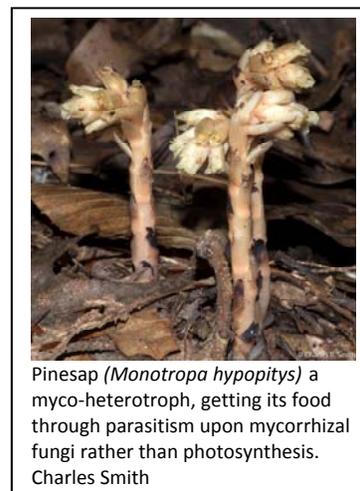


Figure 9. A diagram of the status of species in New York State. <http://www.dec.ny.gov/animals/29338.html>

Current situation: Descriptions of specific important ecological communities¹

Forests are one of the most widespread habitats in Dryden and one of the most valuable for supporting high levels of biodiversity, moderating surface flow and groundwater recharge, reducing erosion, and absorbing and immobilizing large amounts of carbon from the atmosphere. The protection of forested areas thus helps the Town address multiple targets of this Plan. By prioritizing the conservation of large contiguous areas of forest², the Town can protect habitat for many plants and animals of conservation concern, maintain habitat connectivity, and facilitate plant and animal movement in a changing climate, as well as protect groundwater and surface water resources. Dryden has contiguous forest areas of several thousand acres, some of which extend into neighboring towns.

Large forests have values for biodiversity that are not duplicated by smaller forest patches. Certain area-sensitive and disturbance-sensitive wildlife require large interior forest areas to maintain local populations in the long-term. These include mammals such as Bobcat, Black Bear, and Fisher, and many neotropical migratory songbirds, such as Black-



Pinesap (*Monotropa hypopitys*) a myco-heterotroph, getting its food through parasitism upon mycorrhizal fungi rather than photosynthesis. Charles Smith

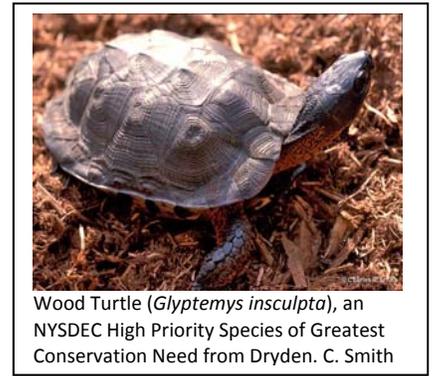
¹ Tompkins County Unique Natural Areas:

http://www.tompkinscountyny.gov/files/emc/educationalmaterial/9_una_countywide_map.pdf

² How large is “large” depends upon the species in question: For forest songbirds, a forested area of 90-100 acres is all “edge” to a Brown-headed Cowbird, making the interior forest songbirds vulnerable to cowbird brood parasitism (calculated from Brittingham and Temple 1983). A home range size range for Fisher is from 490 acres (female) to 9800 acres (male), with an average range of 3185-5635 acres http://www.dec.ny.gov/docs/wildlife_pdf/nyfishermgmtplan.pdf.

throated Blue Warbler and Scarlet Tanager, that tend to disappear from landscapes where only small forest patches remain. Large forests are a declining habitat in the region, so protection of large forested areas, and prevention of further forest fragmentation is a major goal of this Plan. Smaller forests also have conservation value, both as habitats in their own right and as “stepping stone” travel ways for plants and wildlife between larger forest patches.

Upland meadows are extensive and widespread in Dryden, and help to create the signature scenic landscapes of the Town. The ecological values of upland meadows, including active cropland, hayfields, pastures, abandoned fields, and similar areas, can differ widely according to the size, types of vegetation present, and current and past disturbance history (e.g., tilling, mowing, grazing, pesticide applications) of the meadow. Large hayfields or pastures dominated by grasses, for example, may support grassland-breeding birds and butterflies (e.g., Henslow’s Sparrow and American Copper butterfly), in contrast to intensively cultivated crop fields that have comparatively little wildlife habitat value until after harvest has occurred. Undisturbed meadows tend to develop diverse plant communities of grasses, forbs, and shrubs and support an array of wildlife, including invertebrates, reptiles, mammals, and birds.



Wood Turtle (*Glyptemys insculpta*), an NYSDEC High Priority Species of Greatest Conservation Need from Dryden. C. Smith

Some species of rare butterflies (e.g., Black Swallowtail, American Copper, Silver-bordered Fritillary, Baltimore Checkerspot, and Harris’s Checkerspot, to name a few) use upland meadows that support their particular host plants. Upland meadows can be used for nesting by different species of turtles when these areas are adjacent to lakes or ponds. Grassland breeding birds such as Grasshopper Sparrow, Vesper Sparrow, Savannah Sparrow, Eastern Meadowlark, and Bobolink use extensive meadow habitats for nesting and foraging. Wild Turkeys forage on invertebrates and seeds in upland meadows. Upland meadows often have large populations of small mammals (e.g., Meadow Vole) and can be important hunting grounds for raptors, foxes, and eastern coyote. In this context, the Town of Dryden has an excellent opportunity to benefit plants and animals that require meadows and grasslands at the Virgil Creek “dry dam” site (Dr. Donald H. Crispell Flood Control Project), which it manages. Not all of that site, which is approximately 80 acres in size, needs to be mowed every year. In addition, mowing should occur at a time (mid-August or later) that minimizes the negative effects of mowing on rare grassland birds that use the site for nesting or declining Monarch butterflies that use the site during their Fall migration. Likewise, the meadow managed by the Town at the north end of Dryden Lake could be managed similarly. Grassland birds, their nests, and young are protected by both state and federal regulations (e.g. Migratory Bird Treaty Act).

Cool ravines are characterized by very steep slopes and high, rocky walls narrowly flanking a rocky stream. The ravine slopes are typically vegetated with eastern hemlock, and can include the locally rare American yew (*Taxus canadensis*). The very cool, dark, moist environment of the cool ravine habitat often supports plant and animal communities typical of more northern latitudes or higher elevations. These cool areas of the landscape may play an important role as temporary refuges for species that are shifting their ranges northward in response to climate warming. In addition, their relative inaccessibility to browsing or grazing animals, to predators, and to humans often provides protection. Because these habitats often have exposed rock which may create a variety of soil chemistry, varying degrees of sun and wind exposure, and water availability, these places are often hotspots for biodiversity.

Upland shrubland is a common habitat on abandoned farmland, in utility corridors, in cleared forest areas, and in rocky areas with shallow soils; it is often (but not always) a transitional habitat stage between upland meadow and young forest. Many species of conservation concern are known to use shrubland habitats in the region, including some locally-rare butterflies (e.g., some hairstreaks) and nesting songbirds (e.g., Golden-winged Warbler, Rufous-sided Towhee).

A *fen* is an unusual wet meadow/low shrubby wetland habitat fed by calcareous groundwater seepage that supports a species-rich distinctive plant community, including many species that are restricted (or nearly so) to fens in this region. Several state-listed rare plants and animals occur in fens, such as in the O. D. Von Engeln Preserve at Malloryville.

Intermittent woodland- or vernal-pools are small wetlands partially or entirely surrounded by forest, typically with no surface water inlet or outlet (or an ephemeral one), and with standing water during winter and spring that dries up in the summer during a normal year. Despite the small size of intermittent woodland pools, they can support amphibian diversity equal to or higher than that of much larger wetlands. Seasonal drying and lack of a stream connection ensure that these pools do not support fish, which are major predators on amphibian eggs and larvae. The absence of fish helps to make intermittent woodland pools the critical breeding and nursery habitat for some types of frogs and salamanders (e.g., Wood Frog, Jefferson and Spotted Salamanders). The surrounding forest supplies the pool with organic litter, the base of the pool's food web, and is also essential habitat for these amphibians during the nonbreeding season. The invertebrate communities of these pools can be rich, providing abundant food for songbirds. Large and small mammals use these pools for foraging and as water sources.

A ***kettle wetland*** is an uncommon type of wetland that develops in a glacial kettle – a shallow depression formed in glacial outwash where a block of ice stranded from the retreating glacier melted in place. These wetlands can be pools, marshes, swamps or bogs, which can be sparsely or densely vegetated, and are usually partially spring-fed. The plant community of these wetlands is often distinctive. Kettle wetlands that dry up in the summer and are surrounded by forest will serve many of the same habitat functions as intermittent woodland pools for amphibians, turtles, and other wildlife. The Cornell Natural Area at McLean Bogs is a good example.

Floodplain forests and riparian areas are habitats of unusual biological diversity, and are important to many wildlife species of conservation concern. Floodplain forests support the stream habitat by helping to maintain cool stream water temperatures, providing high-quality organic detritus important to stream habitat structure and the stream food web, and providing space and structural complexity that serve to dampen flood flows.

Floodplains serve to temporarily store floodwaters, and thus help to protect downstream areas vulnerable to flooding. Areas with dense herbaceous or woody vegetation are especially effective at dampening flood flows and holding soils in place. Intact riparian habitats also facilitate the regular movement of nutrients, sediment, organic matter, and living organisms between the stream, floodplain, and upland areas.

These areas provide wildlife travel corridors, resting habitat, and habitat for foraging, nesting, or overwintering. Intact stream corridors may be increasingly important in the face of climate change, as they can assist wildlife in their migrations to cooler habitats northward or at higher elevations.

Threats to the Environment and Health

Any loss of a diversity of habitats endangers the ability of our landscape to maintain its rich variety of species, and therefore to maintain the benefits to humans that this biodiversity and functioning ecosystems provide. Climate change is going to put extra stress on many of the species in these systems, so it is imperative that we maintain escape routes for many species, including travel corridors that connect natural areas. We must also maintain refugia, sites that are somewhat more buffered from temperature change, such as ravines and fens, that allow species to survive higher temperatures that can be expected with continued climate change. Efforts must be made to avoid further fragmentation of our large forested tracts. In addition, the expansion of development can easily compromise the ability of the landscape to provide the consistent flow of groundwater to these ecosystems that is necessary for them to continue to exist, as well as to provide water for wells.

Habitat Loss and Conversion

Habitat loss and conversion are perhaps the most important causes of lost biodiversity globally. In Dryden, the nature of habitat loss is primarily the loss of unfragmented forest, resulting from new home development, and decline of open hay fields and pastures with changes in agricultural practices. Fragmentation of expansive habitat areas is a special case of habitat loss: some species are understood to survive most readily within core areas of large woodlands or grasslands. For these species, expansive woodland or grassland provides suitable habitat; unfragmented habitat also supports larger populations and promotes genetic diversity, compared to isolated and fragmented populations.

Because much of the landscape of Dryden was formerly farm fields that have gradually been abandoned over the past century, the more recent abandoned fields are slowly being invaded by shrubs and trees. While some of these, such as white pines, white ash, shrub dogwoods, and viburnums make an attractive landscape and valuable habitat for many species, often the most successful invaders are non-native multiflora roses, bush honeysuckles, Japanese knotweed, and barberries. These species can have growth forms that retard the natural succession to forests and do not support the diversity of insects or bird life that we desire for a healthy ecosystem. As an example, birds nesting in non-native bush honeysuckles have been shown to have higher rates of losses of eggs and young than birds nesting in native shrubs.

Biotic Impacts

The effects of predation, herbivory, and competition among resident species can alter habitats and biological communities. Predation by “subsidized predators,” or predators aided by human settlement, including house cats, raccoons, skunks, foxes, bears, or coyotes, can affect survival of birds, turtles, amphibians, and other animals. White-tail deer might be called subsidized browsers, as they thrive on forest edges, lawns, and gardens of suburban areas. Impacts of deer browsing on the forest community include dramatic reduction of understory habitat and groundcover, which provide essential nesting cover for many birds. In 2005, estimated deer densities in 22 of the 56 counties in New York State, including Tompkins County, were above the threshold at which forest songbirds are negatively affected (Smith and Marks 2008). Deer also alter forest tree composition, as they selectively browse the most palatable seedlings, such as sugar maple and yellow birch, and leave behind less palatable species, such as Norway maple (a non-native tree) and American beech. Deer abundance has become particularly high because population increase is aided by more mild winters that reduce winter kill. In addition the reduction of the number of hunters, restrictions on hunting from game management officials seeking to maintain the herds at elevated levels to aid hunting, elimination of most of the natural predators, and, most importantly, the expansion of denser development and its associated collection of nutritious ornamental plantings into the countryside.

Presently, the only effective means of reducing the deer herd is to encourage a higher level of hunting. Estimates suggest that the density of deer is approximately 3 times what would be needed to bring their impacts down to moderate levels. Cornell University has initiated programs to greatly encourage deer hunting on its properties in Dryden, and there is hope that other state programs will follow their lead. It would be useful for the Town to advocate for these programs with DEC deer-management officials.

Invasive and Exotic Species³

Invasive plants are those of non-native origin that tend to overgrow and replace native flora. The spread of invasive plant species, especially some



Showy Ladyslipper Orchid (*Cypripedium reginae*), a state-listed, protected Exploitably-Vulnerable native plant of Dryden. Charles Smith

³ Dryden invasive species sites on the web- <http://dryden.ny.us/board-commission-list/conservation-board/invasive-species-sites-on-the-web/>

types of vine, is also a dramatic trend in recent years. In particular there is porcelain berry, Asiatic bittersweet, and Japanese knotweed. Many previous invaders, such as *Ailanthus* (tree of heaven) and purple loosestrife have become established as part of the local community. Invasive species also include animals and pathogens. European starlings, house sparrows, rock pigeons, and house finches are common, introduced urban birds. Pathogens are important invaders, as well. Lyme disease, carried by the eastern blacklegged tick *Ixodes scapularis*, is a pathogen that has spread through the region in the recent decades. Likely causes are climatic and environmental changes including increased temperatures, changes in precipitation, milder winters, and changes in landscape features that have caused many areas in the northern region to be more suitable, not just for this tick, but also for the mammals and birds on which this tick depends for a food source. Tree pathogens such as beech blight have dramatically altered the composition of forests. New invertebrate invaders, including hemlock wooly adelgid, Asian long-horned beetle and emerald ash borer, may cause the next round of ecological transitions and local extinctions in our region.

Because hemlock trees play key roles in stabilizing soils in the ravines that they dominate and in cooling the water in the streams next to which they can be found, the potential for the adelgid to cause wide-spread mortality and greatly alter these ecosystems is particularly high. How these and others will modify forest conditions remains to be seen. However, individual homeowners have the option of protectively and effectively treating hemlocks on their property, and research is producing promising results in biologically controlling the adelgid through the widespread release of specific insect predators.

Wetland Loss

Destruction of wetlands is legally restricted for those greater than 12.4 acres (5 hectares), and a 100-foot buffer is required around these wetlands, but smaller wetlands remain vulnerable to development and drainage. These are a particular concern for seasonal woodland pools, which may be invisible to the eye for much of the year. Often these wetlands occur as wetland complexes with extensive underground interconnections. Development of nearby upland areas can interfere with subterranean flow, increase the rate of runoff, or introduce contaminants to these wetland complexes.

Exotic Invasive Plants of Note

Ailanthus (Tree of Heaven) *Ailanthus altissima*

Asiatic Bittersweet *Celastrus orbiculatus*

Buckthorn *Rhamnus cathartica*

Eurasian Milfoil *Myriophyllum spicatum*

Garlic Mustard *Alliaria petiolata*

Japanese Knotweed *Fallopia japonica*

Multiflora Rose *Rosa multiflora*

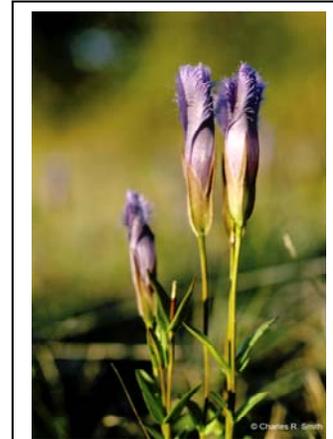
Non-native Phragmites *australis*

Porcelain Berry *Ampelopsis brevipedunculata*

Purple Loosestrife *Lythrum salicaria*

Swallowwort: Black swallow-wort *Cynanchum louisea* and pale swallow-wort *Cynanchum rossicum*

Tartarian Honeysuckle *Lonicera tatarica*



Fringed Gentian (*Gentianopsis crinita*) a state-listed, protected Exploitably-Vulnerable native plant of Dryden. Charles Smith



Pitcher-plant (*Sarracenia purpurea*), a state-listed, protected Exploitably-Vulnerable native plant of Dryden. Charles Smith

Damage to Riparian Zones

Loss of stream-side (riparian) zones can alter in-stream habitats by increasing sediment, chemical, and salt inputs into streams. Riparian zones are critical environments for upland species, such as birds that nest and forage in stream-side shrubs, as well as for in-stream organisms such as turtles, frogs and invertebrates. Riparian habitat is especially important in urban areas, where water and undisturbed shrub environments are otherwise uncommon. Normally, the riparian zone is protected from new development in local master plans or comprehensive plans. However the width of the riparian zone is defined differently by different localities. A buffer of 100 feet or more may be crucial for stream health and to provide necessary habitat in the riparian corridor. Runoff of nutrients, sediment, and other contaminants is affected by amounts of development within 300 feet or more. Loss and degradation of these habitats remains an important consideration in biodiversity conservation beyond the stream corridor itself.

Water Contamination

Water quality affects the health, biodiversity, and composition of the in-stream biotic community, even in relatively undeveloped areas. Principal contaminants in surface waters in Dryden include road salt, excess nutrients from farm operations or septic systems (which increase algae populations), sediment, and high temperatures. Road salt has widespread impacts because roads are widely distributed across the county. In general, salt levels in streams increase proportionally as the area of roads and other impervious surfaces increases. Salinity affects the survival of invertebrates and other in-stream organisms that require clear, fresh water, and also damages, and can change, roadside vegetation. Nutrients from fertilizers, septic systems, and leaking sewer systems, can reduce in-stream biodiversity by causing excessive growth of algae in streams and ponds. Sediment, such as sand or silt, derives from exposed soil or from pavement, and constant sediment influx can smother rocky habitat in the substrate and maintains an unstable stream bed. In-stream biotic diversity is also degraded by warm water temperatures, which are exacerbated by extensive pavement, and from turbidity in water that absorbs solar heat. Reduced riparian vegetation also exposes streams to solar heating and raises temperatures, which can be detrimental to plants and animals in the stream, including trout.

Climate Change

Warming winters, longer summers, and possibly deeper droughts in summer are already having important effects on biological communities in our area, although at present many of the observations are anecdotal. Impacts on biodiversity are likely to involve northward shifts in populations of vegetation, animals, and diseases or parasites that affect plants or wildlife, and even humans, as well as increased prevalence of invasive species. In many areas of New York, cold winters previously prevented the survival of many invasive species that can cause dramatic shifts in habitat and biotic communities. Examples include deer ticks and tick-borne diseases, or the Woolly Adelgid, a minute aphid-like insect that has depleted hemlock stands in warm climates. Forest composition is expected to change considerably as a consequence of climate change.

Loss of Grassland Bird Habitat

Another major threat involves the dramatic decline of grassland breeding birds in the Northeast that has been attributed to the loss of large patches of suitable meadow habitat; many of these bird species need large (>75 acres⁴) meadows that are not divided by fences or hedgerows which can harbor predators. Intensification of agriculture, regrowth of shrubland and forest



⁴ Areas of 75 acres or larger are best for grassland birds, though smaller areas are good for butterflies, pollinators, and other invertebrates. Larger areas provide better buffers against nest predators.

after abandonment of agriculture, and residential development are principally responsible for the losses of high-quality meadow habitat in the Northeast.

If upland meadows are not mowed periodically, shrubs and trees will eventually take over the areas. Mowing of upland meadows during the bird nesting season can cause extensive mortality of eggs, nestlings, and fledglings. Soil compaction and erosion caused by ATVs, other vehicles, and farm equipment, which can reduce the habitat value for invertebrates, small mammals, nesting birds, and nesting turtles, is another threat to the biodiversity values of upland meadow habitats. Farmland where pesticides (fungicides, herbicides, insecticides) are used may have a reduced capacity to support native biodiversity.

Conflict with farming practices

Expansion of some farming practices and the use of pesticides have threatened some species. However, many farm practices can improve habitats for rare and vulnerable wildlife and native plants, while maintaining or improving farm productivity and efficiency. Positive practices include grazing or mowing schedules and patterns that improve habitat for butterflies, bees, nesting birds, and nesting turtles. “Best Practices” land management may enhance water conservation and soil-building. Environmentally-friendly farming practices would include management of field borders to improve pollination, reduce pest problems, and support wildlife; as well as the movement to least-toxic or non-toxic pest management techniques.

Desirable Remedial Actions

Planting Native Plants

Species are disappearing from our neighborhoods, towns, counties, and states as a result of the removal of native habitats for human activities such as residences, roads and agriculture. Native plants provide food for insects which in turn supports our population of birds and other animals. Natives have also been replaced by alien plants like autumn olive, multiflora rose, Oriental bittersweet, and Japanese honeysuckle that do not support native insect species. Local creatures need food and shelter to survive and reproduce and in too many places we have eliminated both. It is estimated that statewide 37% of the state's native plants, vertebrate animals, and ecosystems are in jeopardy of extirpation, and 7% may have been lost already⁵

Native plants are the basis of native food webs, and insects that are adapted to survive on native plants are vital components of healthy ecosystems. So many animals depend on insects for food (e.g., spiders, reptiles and amphibians, rodents, 96% of all terrestrial birds) that removing insects from an ecosystem spells its doom.

Many of our garden ornamental landscape plants are originally from China and Europe rather than those that evolved right here. Every plant species protects its leaves with a species-specific mixture of chemicals. With few exceptions, only insect species that have shared a long evolutionary history with a particular plant lineage have developed the physiological adaptations required to resist the defensive chemicals in their host's leaves. They have specialized over time to eat only the plants with those particular chemicals. When we present local insects with plants that evolved on another continent, chances are those insects will be unable to eat them. We used to think that this was good. But an insect that cannot eat part of a leaf cannot fulfill its role in the food web. We have planted Kousa dogwood, a species from China that supports no insect herbivores, instead of our native flowering dogwood (*Cornus*



Yellow Lady'slipper Orchid (*Cypripedium parviflorum*), a state-listed, protected Exploitably-Vulnerable native plant of Dryden. Charles Smith

⁵ <http://www.dec.ny.gov/animals/29338.html>

*florida*⁶) that supports 117 species of moths and butterflies alone. We have planted trees originating in China instead of one of our oaks and lost the chance to grow 532 species of caterpillars, all of them nutritious bird food. Research has shown that alien ornamentals support 29 times less biodiversity than do native ornamentals⁷. We need to replace unnecessary lawn with local flora and woodlots that can serve as habitat for our local biodiversity. Homeowners can do this by planting the borders of their properties with native trees and shrubs such as white oaks (*Quercus alba*), black willows (*Salix nigra*), red maples (*Acer rubrum*), green ashes (*Fraxinus pennsylvanica*), black walnuts (*Juglans nigra*), river birches (*Betula nigra*) and shagbark hickories (*Carya ovata*), under-planted with shrubs like serviceberry (*Amelanchier canadensis*), arrowwood (*Viburnum dentatum*), hazelnut (*Corylus americanus*), blueberries (*Vaccinium* spp). Studies have shown that even modest increases in the native plant cover on suburban properties significantly increase the number and species of breeding birds, including birds of conservation concern.

Conserving Insect Pollinators

Conservation of insect pollinators is especially relevant at this time⁸. Wild bees are important pollinators of several agricultural crops, including apples, and the future of many agricultural activities depends upon their protection and developing a better understanding of their needs. Encouraging the growth of native plants, including flowering trees and shrubs, that bloom from early spring through fall assists native insect pollinators. Bumble bees and many other pollinators (bees, moths and butterflies) need a safe place to build their nests and overwinter, so that leaving some areas unmowed in summer and unraked in fall, and some standing plant stems in winter assists in maintaining the population of insect pollinators.

Recommendations and Proposed Actions for Dryden

The Conservation Board hopes the Town will take steps to protect important landscapes, ecosystems, habitats, and species of conservation concern, and improve the resiliency of local ecosystems to existing and new environmental stresses, including those brought on by climate change and increased human population. To accomplish these goals this Plan incorporates basic biodiversity conservation principles, and recommends general measures that can be applied to both Town-wide and site-specific land use decisions. Protecting large, contiguous land areas will help to protect the habitats of area-sensitive wildlife species that require large habitat patches to fulfill their life history needs, and will protect the array of natural communities in each area, including those of which we are yet unaware.

To directly lessen the threats to biological resources, this plan outlines the following general principles of biological conservation that strongly affect the ability of the various species to persist in landscapes dominated by humans:

- Broad landscape connectivity facilitates safe movement between habitat areas for plants and animals.
- Habitat patches in large, broad, contiguous configurations are preferable to small, narrow, or isolated patches.
- Roads, driveways, walls and fences create barriers and hazards to wildlife movement.
- Broad zones of undisturbed soils and vegetation around sensitive natural areas help to buffer those areas from effects of human activities (pollution, noise, lights, or soil erosion).



⁶ *Cornus florida* is unfortunately subject to Dogwood anthracnose disease to which *Cornus kousa* is immune, resulting in more *C. kousa* plantings as *C. florida* succumbs.

⁷ <http://www.bringingnaturehome.net/gardening-for-life.html>

⁸ http://www.dec.ny.gov/docs/administration_pdf/nyspollinatorplan.pdf

- Undisturbed vegetation and soils are most effective at maintaining natural patterns and volumes of water movement overland and through the soil.
- Ample groundwater recharge through the soils is essential to maintain the water quality, quantity, seasonal hydroperiods of surface water habitats (streams, lakes, ponds).
- Natural disturbance processes (such as fires, floods, seasonal drawdowns of water, ice scour, and wind forces) help to maintain habitat for important components of native biodiversity.



Grass Pink Orchid (*Calopogon tuberosus*), a state-listed, protected Exploitably-Vulnerable native plant of Dryden

This set of principles can be implemented in Dryden through the following actions.

- Protect areas representing all significant landforms, including the array of elevations and surficial geology, that are representative of the enduring features of the Town.
- Protect habitat areas in large, broad configurations, with broad connections to other habitat areas, to allow animals and plants to move freely and safely between habitat areas.
- Protecting high-quality representatives of all ecologically significant habitats.
- Protecting habitat complexes critical to known species of conservation concern (see lists at end of this report).
- Avoiding fragmentation of large forests and large meadows by roads, driveways, clearings, and structures.
- Direct human uses toward the least sensitive areas, and minimize alteration of natural features, including vegetation, soils, bedrock, and waterways. Maintain broad buffer zones of undisturbed vegetation and soils around ecologically sensitive areas.
- Encourage sustainable forestry practices in working forests, and sustainable agricultural practices that build living soils and conserve water.
- Work with landowners to increase access for responsible hunters in order to maintain deer herds compatible with sustainable woodland diversity.
- Encourage sustainable agricultural practices that build soil, conserve water, and protect water quality.
- Where possible promote wildlife-friendly agricultural practices, such as late mowing to accommodate ground-nesting grassland birds, leaving un-mowed strips and fallow rotations to support pollinators and other beneficial invertebrates, and minimizing applications of pesticides and fertilizers.
- Concentrate new development along existing roads; discourage construction of new roads in undeveloped areas.
- Maintain natural disturbances, such as floods, patterns of stream water flow, ice scour, and wind exposure, all of which help to create and maintain habitat for a wide variety of species.
- Consider environmental concerns early in the planning process for new development projects, and incorporate conservation principles into the choice of development sites, the site design, the stormwater management, and the construction practices.
- Encourage the planting of native plant species in order to maintain wildlife diversity.
- Inform Town agencies, landowners, and the general public about the Cornell Botanic Garden Natural Areas, Finger Lakes Land Trust Preserves, Tompkins County Unique Natural Areas, DEC Significant Biodiversity Areas, and the NY Natural Heritage Program Important Areas, to heighten awareness of their conservation importance.



Pink Ladyslipper Orchid (*Cypripedium acaule*), a state-listed, protected Exploitably-Vulnerable native plant of Dryden. C. Smith

Dryden needs to create a map of ecologically significant habitats created by a biodiversity assessment team of knowledgeable community volunteers, with assistance from biologists, naturalists and currently existing available resources. The map and associated report will describe the locations and extent of habitats, their importance for biodiversity, and the plants and animals of conservation concern that are known or likely to occur in those habitats.

This effort should delineate and map common habitats such as upland forests, meadows, swamps, and shrublands, and rarer habitats such as fens, kettle wetlands, and cool ravines. A report accompanying this map should describe the habitats and their ecological values, and provide site-specific recommendations for conservation. The map and report will help landowners, developers, and Town agencies understand the parts of the landscape that support our biodiversity resources, and devise ways to protect the most important areas. It would be valuable to consider mapping and establishing a minimum buffer zone around intermittent woodland pools, and allow for a larger buffer zone where warranted due to local habitat attributes.

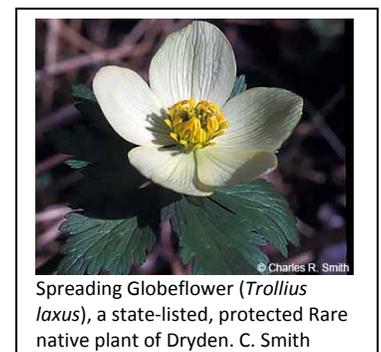
This Plan envisions the conservation of large, broadly-connected areas representing a variety of landforms (such as hill summits and valleys, side slopes, ravines), bedrock types, soil types, and hydrological conditions, and seeks to maximize the connectivity of intact habitat areas. This approach will help to maintain important biodiversity elements in the present, and will provide the greatest opportunities for future adaptation and safe migration of wildlife and plants to suitable habitats in a rapidly-changing environment.

Protecting large contiguous areas will help to protect the habitats of area-sensitive wildlife species that require large habitat patches to fulfill their life history needs, and will also protect the array of natural communities in each area, including those of which we are yet unaware. The Plan encourages the protection of high-quality representatives of all ecologically significant habitats or communities in the Town. Prioritizing the protection of areas with concentrations of unusual and rare habitats will help ensure that the most imperiled biological communities will not disappear from our landscape.

Developing Policy for Biodiversity Conservation

While laws to protect biodiversity have been enacted at the federal and state level, New York is a home-rule state, which means that local municipalities hold considerable power to set land use policies, to outline plans for biodiversity protection, and to regulate land use. Thus local areas are legally empowered to make decisions, but they also have responsibility for policy making through zoning and local planning processes. Citizens can wield considerable influence by attending local planning meetings, municipal council meetings, and zoning board meetings.

There are many opportunities for municipalities to influence biodiversity protection or to seek aid in projects that can support local biodiversity by working with local non-profit organizations such as land trusts and conservation groups. Habitat conservation strategies include conservation easements and transfer of development rights. Conservation easements are deeds that restrict future development. Transfer (or purchase) of development rights involves payment to landowners today to control development rights in the future. Alternatively, development rights can be exchanged from one property to another. As with conservation easements, a non-profit organization or municipality normally holds the development rights and monitors future compliance with the terms of the agreement.



Legal Protections

The importance of biodiversity for its own sake has been acknowledged in the formation of legal codes that protect species and their habitat, including water, air and wetlands⁹. There are legal protections for rare, threatened, endangered, and migratory species, in efforts to minimize threats to biodiversity. Agencies that administer these regulations usually also provide assistance to landowners. Because landowner participation is so important in conservation in New York, the US Fish and Wildlife Service and other agencies are charged with helping landowners design conservation plans, devise plans for development that maximize habitat conservation, and provide grants for assistance in habitat conservation.

The principal legal mechanism for environmental review in New York is the [State Environmental Quality Review \(SEQR\)](#). Like the federal government's Environmental Impact Statement, a SEQR study identifies probable environmental impacts and outlines how a project will address those impacts. State, county, and local governments can act to enforce the SEQR process. In addition, since 2005, all environmental impact statements must be posted online for public access. Thus citizens have access to examine the contents of review findings.

Biodiversity is protected most specifically at the federal level by the Endangered Species Act of 1973, which defines and lists rare, threatened, vulnerable, and endangered species both nationally and regionally. The ESA also provides assistance in planning for habitat conservation, and it provides a framework for enforcing species protection laws if necessary. The Migratory Bird Treaty Act of 1918 is one of our earlier landmark species protection laws that allows for protection of native wild birds. These and other federal policies can provide the most general policy protection for biodiversity in our area, if local polices prove insufficient.

Summary

The Town of Dryden has a wealth of different types of biological communities, many with a great amount of internal diversity, and many especially unique in the landscape of upstate New York. However, a great many of these communities and the habitats on which they depend are fragile, and can be easily lost from the landscape if not protected from overuse or development. Along with the great opportunities these abundant resources offer for nature enjoyment, study, and preservation comes a large responsibility of the Town to ensure that this complex set of species, populations, and ecosystems are allowed to sustain themselves and thrive for the benefit of generations to come.

References

Cunningham, M. A., Curri, N. and Wills R. 2010 Biological Resources and Biodiversity of Dutchess County, NY www.co.dutchess.ny.us/countygov/departments/planning/nrichapsix.pdf

Smith, C.R. and P.L. Marks. 2008. Land-use Changes and Breeding Birds. Pp. 59-68, in K.J. McGowan and K. Corwin (eds), Second Atlas of Breeding Birds in New York State. Cornell University Press, Ithaca, NY. 688 pp.

The New York Department of Environmental Conservation's Twin Sheds Unit Management Plan for the Hammond Hill and Yellow Barn State Forests:

<http://dryden.ny.us/board-commission-list/conservation-board/twin-sheds-unit-management-plan/>

A list of recommended species for planting for wildlife diversity in the mid-Atlantic region can be found at: <http://www.bringingnaturehome.net/what-to-plant.html> and a more extended Excel list is at http://copland.udel.edu/~dtallamy/new_xls/webplants.xls

Sustaining New York's Animals, Plants and Ecosystems: <http://www.dec.ny.gov/animals/279.html>

⁹ NYS Wetlands Protection Act (http://www.dec.ny.gov/docs/wildlife_pdf/wetart24a.pdf) and federal Clean Air (<https://www.epa.gov/history/epa-history-clean-air-act-amendments-1990>) and Clean Water Acts (<https://www.epw.senate.gov/water.pdf>) (the basis for federal protection of wetlands).

FARMLAND AND AGRICULTURE



Dryden crops (corn left; soybean right) from Ferguson Road in September. Peter Davies

Agriculture in Dryden

Productive and profitable local agriculture benefits the local economy, local food security, the visual landscape, and the culture of the human community. There are approximately 14,512 acres involved in farming (24% of the Town's land base), with an estimated \$12 million economic impact, of which about \$8 million is attributed to dairy farms (Town of Dryden Agricultural Profile Draft 5-26-2016). Active, fallow, and abandoned farmland can also contribute significantly to native biodiversity, and intact habitats in the vicinity of farms can, in turn, provide services and resources, such as micro-climate, critical to the success of local farms. The Town is dedicated to supporting Dryden's working farms, and protecting the best farmland for current and future agricultural uses.

Dryden is fortunate to have large areas of good farmland soils, and many active farms (Figure 10). The overall viability of agriculture in Dryden is healthy. This is evident from the increased number of acres of abandoned/fallow acres being brought back into active production over the past 10 years. Agriculture is also evolving in the Town. This is most evident from the expansion and consolidation of large dairy farms. What was once a patchwork of many small dairy farms across the Town has now evolved into three dairy farms shipping milk (2 large, 1 medium, as categorized by NYS DEC).

Competition between farms for good agricultural soils is in part responsible for rising farmland property values, as well as land development interests, to some degree. Even with these trends there remains a strong diversity of all size farms and farm enterprises with a

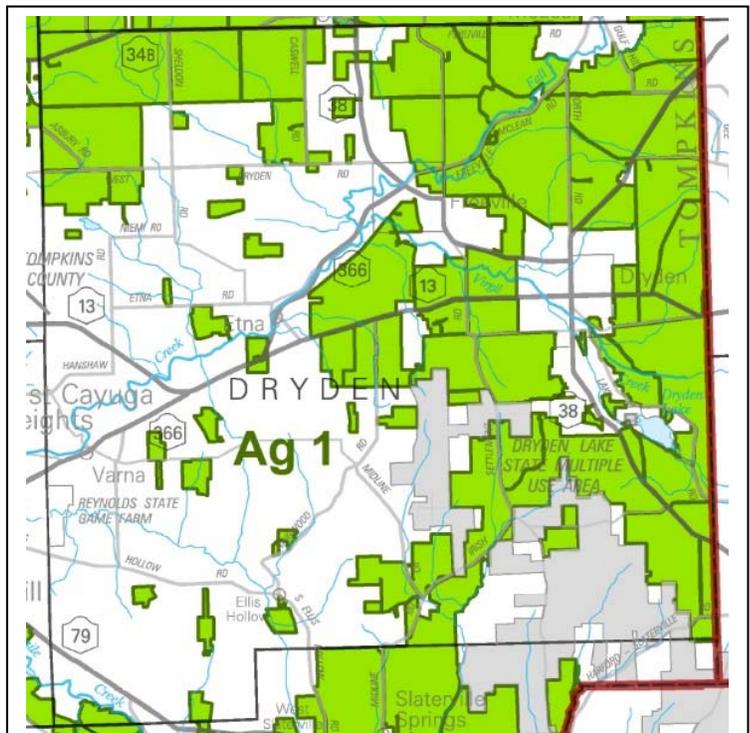


Figure 10. Dryden Town map with some of the farmland (Ag 1 classification) in green



Cattle along Livermore Road on the Lew Lin Farm. Craig Schutt

diversity of crops grown (using both conventional and organic production), including hay, corn, soybeans, fruits and vegetables, beef, sheep and goats, equine, small grains, horticulture, hops, and farm markets. Recent interest in locating large commercial solar arrays on Town of Dryden agricultural lands will inevitably have an effect on land values that is yet to be determined.

While farmland can provide important habitat for native plants and animals, the kinds of farm practices on any site will help to determine the actual positive or negative impacts on biodiversity and on groundwater and surface water resources. For example, mowing schedules, grazing intensity, use of fertilizers and pesticides, and treatment of soils will all influence the habitat quality of farmlands, the interchange of on-farm and off-farm organisms, and the effects on groundwater and nearby streams. Many kinds of farm practices help to support important habitats and water quality while improving soil health and farm productivity. Farmers are among the largest landowners and the most important land stewards in Dryden, and are thus essential partners in natural resource conservation efforts.

Dryden Agriculture Recommendations

The Town of Dryden recognizes that local agriculture brings innumerable benefits to the local economy, to local food security, to the scenic character of the landscape, and to the culture of the human community. Maintaining our ability to produce food locally has obvious advantages in the face of unstable and unpredictable energy supplies, and the worldwide imperative to reduce carbon emissions. Active and abandoned farmland can also contribute significantly to native biodiversity, and intact habitats in the vicinity of farms can, in turn, provide critical and irreplaceable services and resources (such as climate moderation, high quality water, flood attenuation, and habitat for pollinators and insect predators on agricultural pests) to farm enterprises.

Active, fallow, and abandoned farmland can also provide habitats important to native plants and animals of conservation concern, such as grassland birds and turtles that nest in meadows, raptors, mammals and snakes that hunt in meadows, and insect pollinators that rely on cropland, hayfields, old fields,

and brushy edges to meet their needs for food, resting, pupation, and overwintering. Farmland that is adjacent to unmanaged habitats (e.g., forests, abandoned fields, wetlands) can be especially valuable



Sheep along Schutt Road, Dryden. Bard Prentiss



Farm along McClintock Road in winter. The barn has a steel frame and was built in 1908 by the Groton Bridge Co. It is unique. Peter Davies



Dryden farmstand in fall. Charles Smith



Cutting oats to be chopped for feed: Schutt Road. Craig Schutt

for wildlife that needs a complex of different habitats to meet their life history needs. Intact adjacent habitats also support the diverse pollinators that are essential to certain agricultural crops.

General Measures for Farmland Conservation

- Protect active farmland, prime farmland soils, and farmland soils of statewide importance from development as much as possible.
- Design new subdivisions and development sites in ways that preserve the areas of best farmland soils intact and unfragmented as much as possible.
- Maintain intact habitats in and near hayfields, cropland, orchards, and pastures to help support pollinators and wildlife.
- Promote farming practices that conserve water, prevent soil erosion and soil loss, build living soils, and minimize applications of toxic substances.
- Minimize applications of fertilizers and pesticides, and especially in the more sensitive areas such as floodplain fields, and maintain cover crops and thatch to minimize soil loss during heavy precipitation or flood events.
- Where possible, shift tilled land in floodplains to other uses (such as pastures, hayfields) more resilient to flooding.
- Encourage farms to participate in the NYS Agricultural Environmental Management (AEM) administered through the Tompkins County Soil and Water Conservation District (SWCD).
- Encourage farms to work with the Natural Resources Conservation Service (NRCS) and SWCD to develop conservation plans that will allow farms access to programs and funding to implement Best Management Practices (BMPs) on their farms.

The Town's dedication to supporting working farms and protecting the best farmland for current and future agricultural uses will be highlighted in the Town of Dryden Agriculture and Farmland Protection Plan currently under development by the Town of Dryden Agricultural Advisory Committee. A major threat to local agriculture, as elsewhere, currently is volatility of commodity prices.

Summary

This Natural Resources Conservation Plan places a high priority on support of active farms and conservation of the best farmland soils to maximize the current and future potential for farming in the Town. The Plan also promotes best farming practices that improve soils, conserve water quality and quantity, enhance wildlife habitats, reduce wildlife mortality, and increase resiliency to the effects of climate change. The Town can promote local food production and markets through strategic conservation of working lands and high-quality farmland soils, partnering with other organizations and government to build new infrastructure and services, and offering events and educational programming to foster production and consumption of local agricultural products. Protecting the best farmland soils, whether or not they are actively farmed at present, will help to ensure the future of viable agriculture in the Town.



RECREATIONAL RESOURCES

General Goals

Outdoor recreation is an important part of local family and community life, attracts visitors, and benefits local businesses, and can serve to strengthen people's connections to and appreciation for the land. Outdoor recreation includes hiking, cross-country skiing, bicycling, horseback riding, nature observation, and outdoor photography, among other activities. The kinds of public outdoor recreation best suited to Dryden are those that take advantage of natural landscapes and cultural features while protecting intact the resources of conservation concern. Public recreational opportunities tied to the natural landscape can help to spur economic development and, if designed carefully, have relatively low environmental impacts. Expansion of such opportunities will benefit Town residents, visitors, and the businesses that serve visitors, such as restaurants, retailers, and hospitality services.

Existing public recreation opportunities and features in Dryden:

- Hiking trails (Figure 11) and nature preserves (Figure 12); excellent for recreation, bird watching, nature study, research and appreciation.

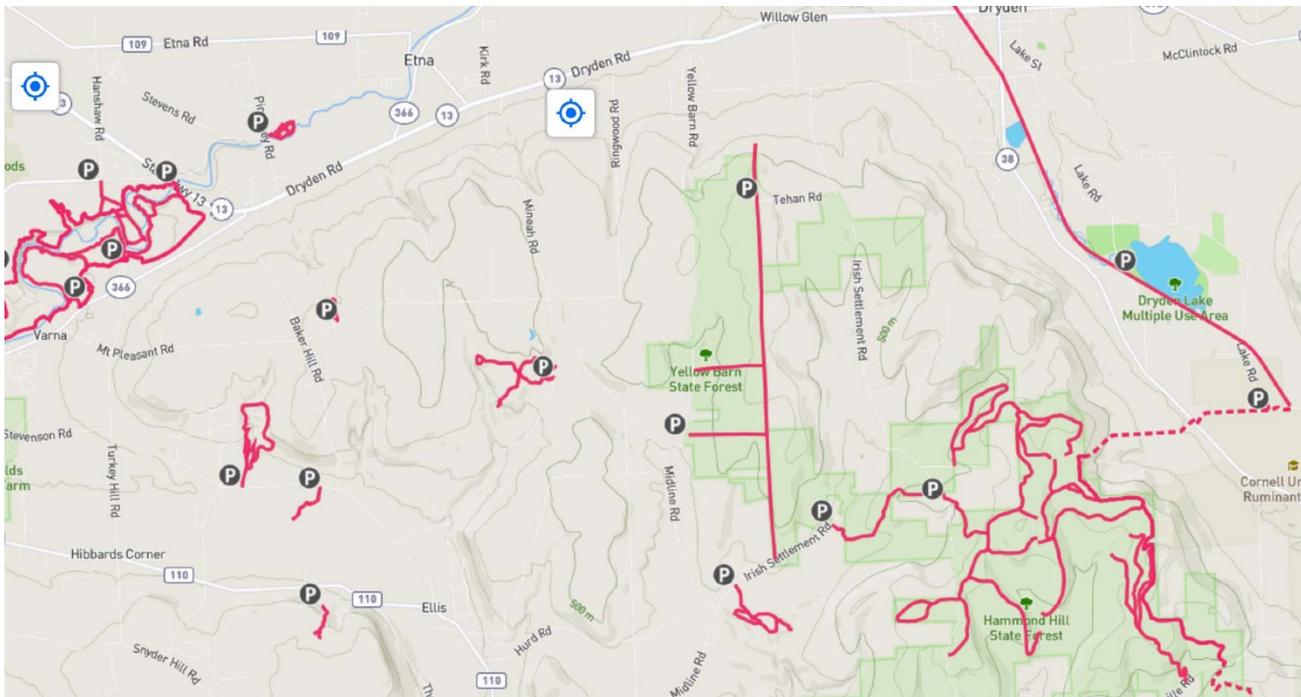


Figure 11. Trails in southern Dryden with parking areas. For full map see <https://ithacatrails.org/>
A complete map and descriptors of Dryden trails is in Appendix A

- Public access sites for fishing on Fall Creek and Dryden Lake.
- Various public access sites for picnicking.
- Unpaved public roads throughout the Town for biking and walking (and skiing before they are plowed).
- Deer hunting and turkey hunting in season (NYS hunting license required).
- Public-accessible area for mountain biking, with approximately two miles of intermediate-level trails that are also used by hikers, skiers, snowshoers and snow bikers.
- Snowmobiling and ATV use. Because of their contributions to noise and air pollution, damage to soils, and disturbance to wildlife, their use is discouraged in ecologically sensitive areas.
- Areas that can be used with landowner permission. Most large private land parcels and many smaller ones in Dryden are posted against trespassing, so most private lands are inaccessible for



Tracking in winter on Hammond hill. Suzanne Gervais



Snowshoeing on Hammond hill Suzanne Gervais

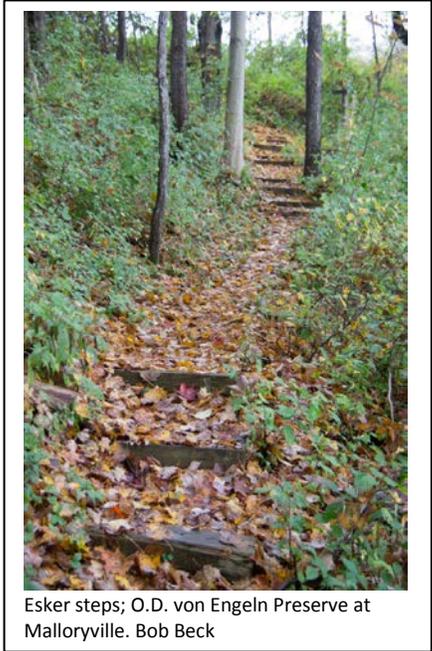
walking, hiking, biking, skiing, motor sports, hunting, or other recreational use without landowner permission.



Red squirrel tracks; Ellis Hollow. Nancy Munkenbeck

Complete Streets

One way to expand recreation opportunities in Dryden, while simultaneously making our roads and hamlets safer for all users, is to adopt a “Complete Streets” program for transportation projects. The New York State Complete Streets program, authorized under Chapter 398 of the Laws of New York, requires that any transportation projects receiving state and federal funding must be designed with consideration of the convenience, mobility, and safety of users of all ages and abilities, including bicyclists, pedestrians, people with disabilities, riders on public transportation, as well as motorists. Although the law applies only to projects using federal and state funds, local governments are also encouraged to consider these principles for locally funded projects. Street design features may include, but are not limited to: sidewalks, paved shoulders suitable for use by bicyclists, lane striping, bicycle lanes, “share the road” signage, crosswalks, pedestrian control signals, bus pull-outs, curb cuts, raised crosswalks and ramps and traffic calming measures.



Esker steps; O.D. von Engeln Preserve at Malloryville. Bob Beck

The purpose of the Complete Streets program is to promote a “cleaner, greener transportation system,” promote the health benefits of non-motorized travel, create safer conditions for all users, relieve traffic congestion, and reduce auto-related air pollution. In the Villages of Dryden and Freeville, and the hamlets of Etna and Varna, sidewalks, well-marked pedestrian crossings, accessible curb cuts, and street trees can improve the safety and comfort of users. On Dryden’s rural roads, wide shoulders can improve the safety and comfort of pedestrians and bicyclists, as well as motorists. More information on Complete Streets can be obtained at

<https://www.dot.ny.gov/programs/completestreets>.



O.D. von Engeln Preserve at Malloryville. Bob Beck

Dryden Rail Trail

There is a current (2017) effort to establish a **Dryden Rail Trail** to connect the Jim Schug Trail to the East Ithaca Recreation Way, passing through Freeville, Etna and Varna along the route: <http://dryden.ny.us/board-commission-list/rail-trail-task-force/>

This Plan supports projects that protect, enhance, or expand opportunities to engage the public, especially children, in outdoor activities, and expand local and regional hiking, multi-purpose trails, and rail trail systems. All trails and other recreational features should be located and designed to minimize impacts on intact habitats, wildlife, and water resources.

Actions for Conservation and Enhancement of Outdoor Recreation Resources

- Work to complete Cayuga Lake's Emerald Necklace¹, which will incorporate much of what we wish to save in the Town of Dryden as well as produce a contiguous link of natural habitats across a wide region.
- Support the completion of the Rail Trail from Dryden Village, through Freeville, Etna and Varna to Game Farm Road in the Town of Ithaca.
- Work with homeowners associations to develop additional public trails.
- Adopt the Complete Streets approach to enhancing the quality and safety of Dryden's roads for biking, walking, and other uses.
- Develop additional public access sites for fishing and non-motorized boating on Dryden's lake and streams.
- Plan and develop hiking trail connections
- Develop potential trails and other recreational features on the Dryden Town Hall property.
- Plan and develop additional walking trails within reach of the more densely populated areas.

References

Ithaca Region (Tompkins County) Trail Map <https://ithacatrails.org/>

Dryden Trails: <http://dryden.ny.us/departments/planning-department/dryden-trails/>

Parks and Trails Maintenance Guidelines 31 March 2015:

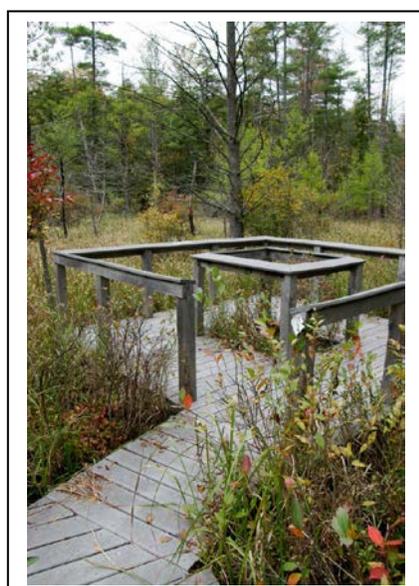
<http://dryden.ny.us/wp-content/uploads/2017/01/Trail-Maintenance-Guidelines-3-31-15.pdf>



Yellow Birch (*Betula alleghaniensis*) in winter; O.D. von Engeln Preserve at Malloryville. Bob Beck



Boardwalk with ferns; O.D. von Engeln Preserve at Malloryville. Bob Beck



Bog Overlook; O.D. von Engeln Preserve at Malloryville. Bob Beck

¹ A corridor of protected areas that ring Ithaca approximately 10 miles to the west, south, and east, including Dryden.

SCENIC RESOURCES, VIEWSHEDS AND NATURAL AREAS

Dryden Views

The term *viewshed* denotes a concept that allows us to make a visual assessment of the scenic value(s) of a particular area or region. We obviously recognize, with little effort, a delightful view versus an unsightly one. Terms such as remarkable, spectacular, terrific, or beautiful come to mind as we gaze, identify features, estimate distance and in general appreciate our ability to see and understand so much from a single location. Few people need be told the value of seeing the landscape from a distant vantage point. While landforms and valleys can be large, major and even minor changes can affect a viewshed in negative ways. Clearly, we need to recognize a need for caution as we build out, cut down, rearrange and develop our existing open lands.

Dryden's visual landscape - the wooded hills, rocky hillside

streams and meandering valley-streams; Dryden Lake and smaller ponds; hayfields, pastures, cropland and old fields - is central to the history, economy, and culture of the Town. Scenic resources help connect people to the land, foster appreciation of our natural resources, and offer a strong sense of place for residents and visitors alike who are drawn to the area.

The scenic beauty of the Town is closely tied to the other natural resources addressed in this conservation plan - the physiographic patterns, water resources, biological communities, and



View from Mt. Pleasant in Dryden. Charles Smith



Dryden Lake from Dryden Lake Park. Bard Prentiss



Downey farmstead on NY Route 392 from Daisy Hollow Road. Bard Prentiss

farmland activities. While many scenic areas will be protected under their own natural or legal umbrella, other areas deserve conservation attention in their own right.

Dryden's Natural Amenities

The Town of Dryden is home to many prominent and valued natural areas that serve as important habitat to native species and support a rather rich biodiversity (Figure 12). The Town stretches over 94.2 square miles or 60,288 acres (of which water represents 0.3 sq. mi. or 0.31%), with 10,760 acres designated as permanently-protected open space. Despite considerable population growth over the last 40 years, 90% of the land area remains in active or fallow (inactive) agricultural land, pasture, shrublands, woodlands, forests², or wetlands. Yellow Barn and Hammond Hill State Forests are two prominent natural and recreation areas in Dryden, and total more than 8,700 acres of forest. Of the 10,760 acres of designated open space, 1,870 acres are considered ecologically or geologically significant. That land, composed of stream corridors, wetlands, and upland hardwood forests, is in 16 private preserves that are owned and maintained by Cornell University, Cornell Botanic Gardens, Cayuga Nature Center, Finger Lakes Land Trust, and The Nature Conservancy.



Looking south from McClintok Road, Dryden, winter. Bard Prentiss



Looking southwest from McClintok Road, Dryden. Bard Prentiss

Important Preserves in the Town of Dryden include:

- Jim Schug Trail (Dryden Lake Trail)
- O.D. Von Engeln Preserve at Malloryville.
- Genung Nature Preserve
- Etna Nature Preserve
- Sapsucker Woods Sanctuary (Eastern half)
- Monkey Run Natural Area
- Ellis Hollow Nature Preserve
- Roy H. Park Nature Preserve

Threats to Viewsheds, Environment, and Mental Well Being:

- Disregard or failure to consider impacts to the entire viewshed of any new structure or new land use.
- Failure to protect unique geological features, natural areas and active farms, visible from public roadways.
- Ignore or neglect to maintain intact hilltop tree canopy lines, steep slope vegetation, and soil erosion issues on both fallow and active farmland.
- Failure to recognize potential negative impacts of new buildings and the lighting that often comes with their development.



Black Cherry tree from Mt Pleasant road. Bard Prentiss

² Wooded areas with 75% or greater canopy cover are categorized as forests, and areas with less than 75% canopy cover are woodlands.

Conserved Lands in the Town of Dryden Tompkins County, NY

- | | |
|---|--|
| <ul style="list-style-type: none"> ■ FLLT Nature Preserves (547 ac) ● FLLT Easements (955 ac) ■ Cornell University Conserved Lands | <ul style="list-style-type: none"> ■ Municipal Conservation Lands ■ The Nature Conservancy Lands ■ NYS DEC Lands |
|---|--|

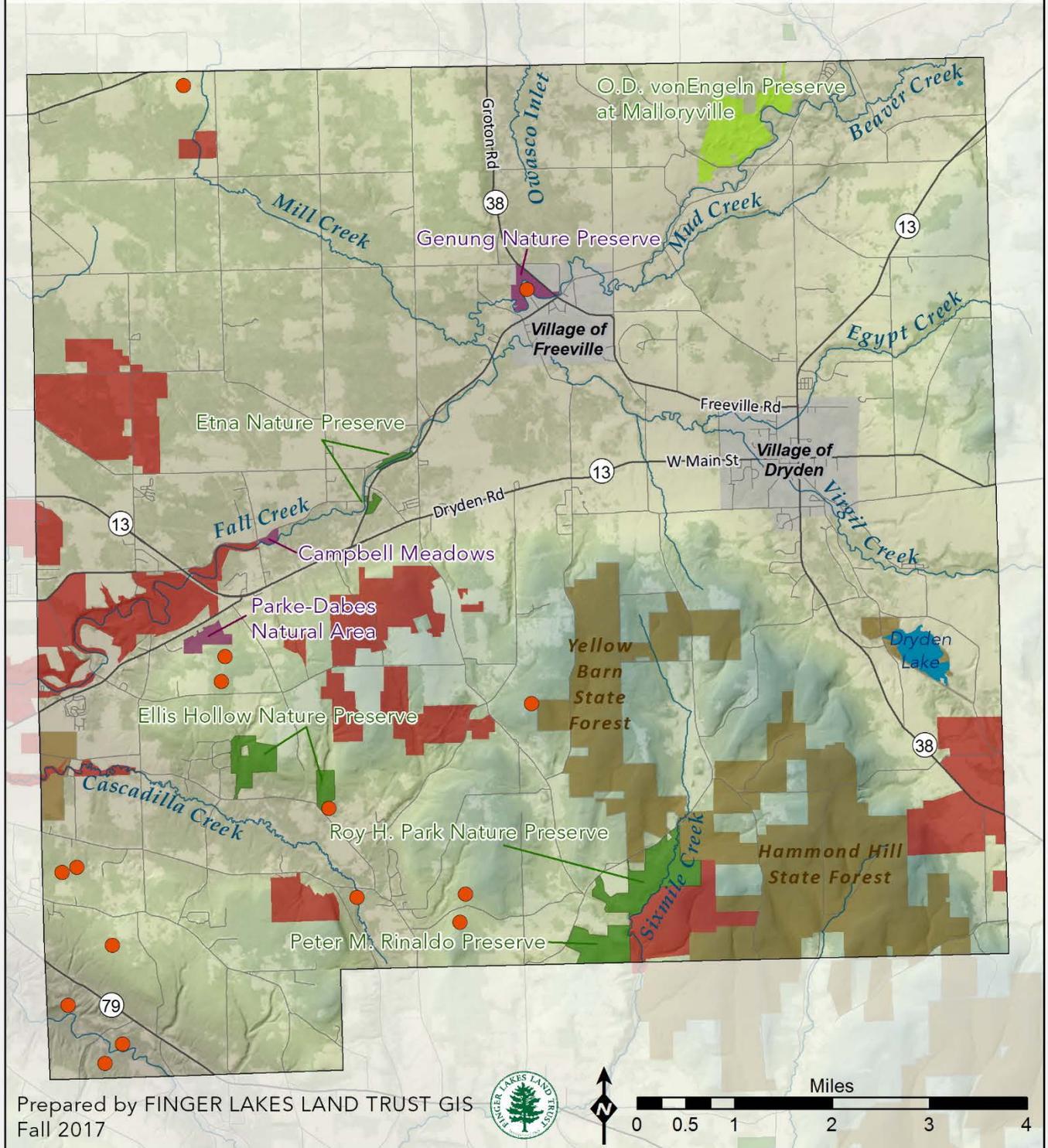


Figure 12. Nature Preserves in the Town of Dryden

Recommendations:

- Consider the impacts on the entire viewshed in the location and design of any new structure or land use within the Town.
- Maintain intact, both natural areas and active farmlands that are visible from public roads when possible.
- Wherever possible maintain intact hilltops, steep slopes, and tree canopy lines, particularly in viewshed areas.
- Endorse Town policies that support working landscapes of farms and forests, but emphasize sustainability of soil and water resources for all practices.
- Avoid clearcutting but favor select harvest techniques to help maintain forest coverts and avoid disruption of tree canopy lines.
- Expand the appreciation and knowledge base about the viewshed resources of the Town and County. This can help ensure sustainability and preserve the sense of place that now exists.
- Enlist/Engage the public schools to make full use of the ecological laboratory at hand.
- Develop an art and/or photo contest with award recognition and prizes for differing age groups, and display the works prominently in local establishments.



Conclusion

The natural beauty of the Town of Dryden, as seen from many vantage points is truly remarkable, and should be preserved so as to provide a tranquil and dignified sense of place for current and future inhabitants. Let us move forward with care and reverence as we recognize, appreciate, value, celebrate and protect our Town's scenic resources.

Online Inventories of Scenic Resources.

County Scenic map: <https://geo.tompkins-co.org/html/?viewer=scenic>

Tompkins County: Protecting Our Scenic Resources (2010):

http://www.tompkinscountyny.gov/files/planning/Natural_Agriculture/Protecting%20Our%20Scenic%20Resources%20December%202010.pdf

Tompkins County Scenic Resources Inventory (2007):

http://www.tompkinscountyny.gov/files/planning/Natural_Agriculture/TCSR%20report%20Jan%202017.pdf
Report; [Interactive Map](#)

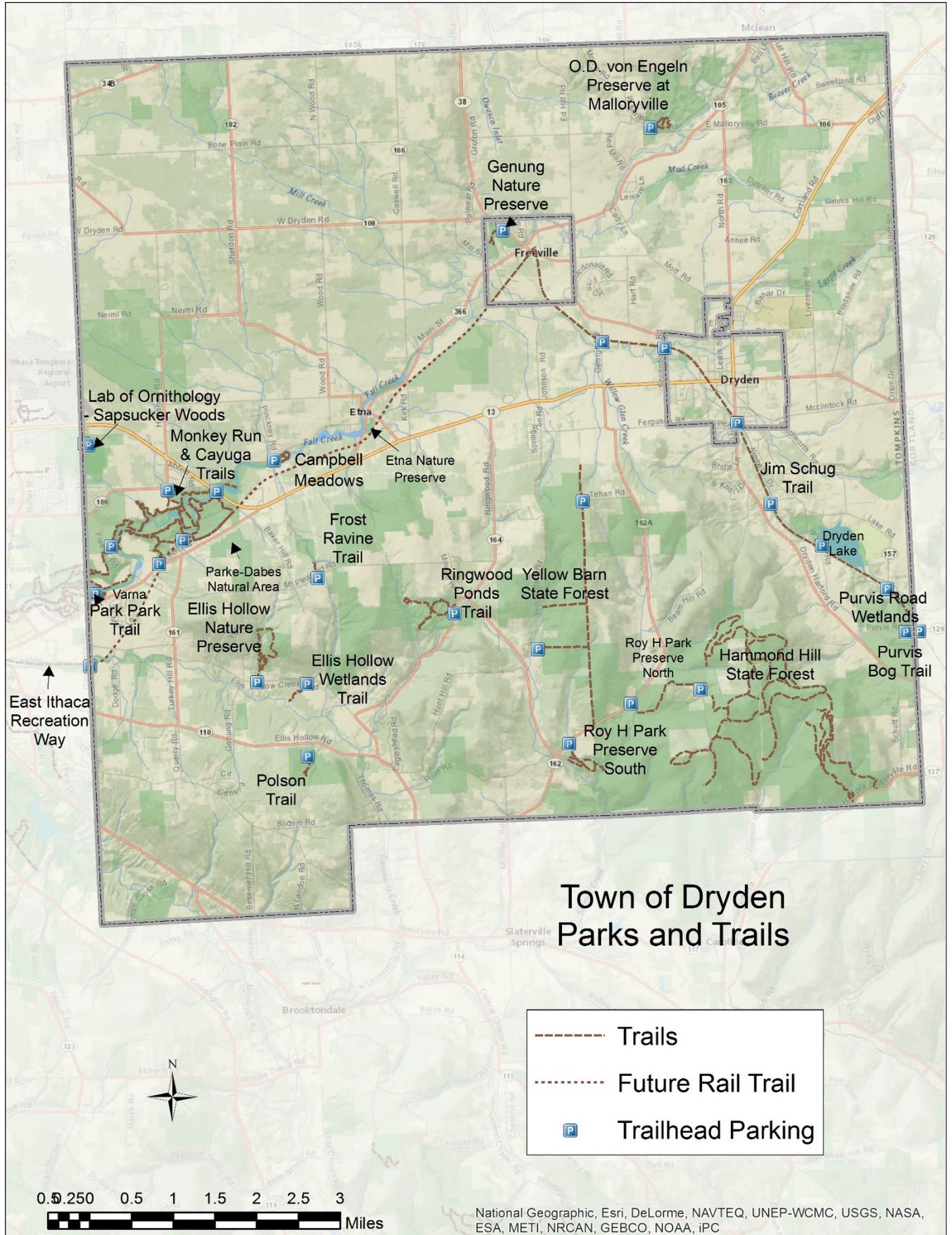
Dryden Critical Environmental Areas (draft report): <http://dryden.ny.us/board-commission-list/conservation-board/cea-documents/>

Tompkins County Unique Natural Areas:

http://www.tompkinscountyny.gov/files/emc/educationalmaterial/9_una_countywide_map.pdf

APPENDIX A

TOWN OF DRYDEN PARKS AND TRAILS



TOWN OF DRYDEN PARKS AND TRAILS

The Town of Dryden offers many beautiful trails and natural areas to explore!

[Campbell Meadows](#)– Easy winding trails follow Fall Creek with many scenic views and places for a picnic.

[Dryden Lake Park](#)– This .75 mile long lake is great for family gatherings. Parking area for Jim Schug Trail.

[Ellis Hollow Nature Preserve](#)– This 1.5 mile trail is a medium to difficult rating. Hiking, bird watching, and cross-country skiing are all allowed.

[Etna Nature Preserve](#)– A .25 mile trail through a 12 acre nature reserve, with an abundance of wildlife and foliage.

[Genung Nature Preserve](#)– This 53 acre land preserve has an easy hiking trail roughly 1 mile long along Fall Creek.

[Hammond Hill State Forest](#)– 3,618 acres and 8 trails with 5.6 miles in length offer the public many opportunities.

[Jim Schug Trail](#)– This 4.2 mile trail is flat and easy. Good for walking, bike riding, snowshoeing and more.

[Monkey Run Preserve](#)– Medium to hard difficulty, this preserve offers scenic views and beautiful foliage along Fall Creek.

[O.D. Von Engeln Preserve at Malloryville](#)– On 308 acres, two trails offer 1.75 miles of hiking through glacier-formed terrain, wetlands and luscious plant life. These medium difficulty trails are great for hiking, bird watching, and low impact activities.

[Roy H Park Preserve – North and South](#)– This 241-acre preserve encompasses an extensive forest, wetlands, and a rugged stretch of Six Mile Creek. An easy and inviting trail leads you through a former farm field along one of the loveliest, wildest stretches of the creek.

[Sapsucker Woods Sanctuary](#)– The 230-acre sanctuary encompasses forests, ponds, ferny swamps, and abundant wildlife.

[Yellow Barn State Forest](#)– Yellow Barn State Forest covers 1,289 acres of land. The forest is primitive in nature and passive recreational activities such as hunting, trapping, and snowmobiling can be enjoyed.

APPENDIX B: NOTABLE BIOLOGICAL SPECIES IN DRYDEN

Plants of Conservation Concern, Dryden, NY

Several state-listed rare species of plants and animals are known to occur in Dryden. Below we present lists of plants of conservation concern known to occur within the Town of Dryden, as of December 2016. This is an incomplete list as it is likely that several additional species could be added to this list, especially from more difficult-to-identify groups like grasses, sedges, and asters, if more detailed information were available. A link to the complete list of protected plants in New York State can be found at <http://www.dec.ny.gov/animals/7135.html>.



Note that it is a violation of the Environmental Conservation Law §9-1503 to collect or destroy listed plants without the permission of the landowner. The regulation gives landowners additional rights to prosecute people who collect plants without permission. (For a more complete description of regulations, refer to the Official Compilation of Codes, Rules and Regulations of The State of New York. Title 6. Department of Environmental Conservation Chapter II. Lands and Forests, Part 193. Trees and Plants - See 6 NYCRR-193.3³)



Following are lists of endangered, threatened, rare, or exploitably vulnerable species that are protected native plants pursuant to section 9-1503 of the Environmental Conservation Law. The common names contained on these lists are included for information purposes only; the scientific name shall be used for the purpose of determining any violation. Site means a colony or colonies of plants separated from other colonies by at least one-half mile.

Endangered native plants:

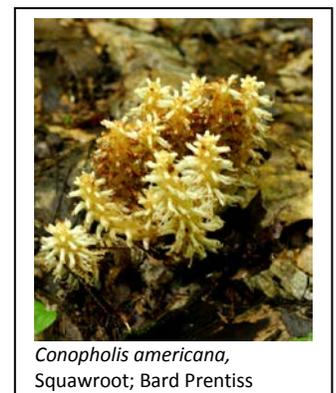
The following are endangered native plants in danger of extirpation throughout all or a significant portion of their ranges within the State and requiring remedial action to prevent such extinction. Listed plants are those with five or fewer extant sites, or fewer than 1,000 individuals, or restricted to fewer than four U.S.G.S. 7½ minute series maps, or species listed as endangered by the United States Department of the Interior in the Code of Federal Regulations.

Platanthera hookeri, Hooker's Orchid

Threatened native plants:

The following are threatened native plants that are likely to become endangered within the foreseeable future throughout all or a significant portion of their ranges within the State. Listed plants are those with 6 to fewer than 20 extant sites, or 1,000 to fewer than 3,000 individuals, or restricted to not less than four or more than seven U.S.G.S. 7½ minute series maps, or species listed as threatened by the United State Department of the Interior in the Code of Federal Regulations.

Botrychium oneidense, Blunt-lobe Grape Fern



³ <http://www.dec.ny.gov/regulations/regulations.html>

Rare native plants:

The following are rare native plants that have from 20 to 35 extant sites or 3,000 to 5,000 individuals statewide.

- Trollius laxus*, Spreading Globeflower
- Pinus banksiana*, Jack Pine (introduced)

Exploitably vulnerable native plants:

The following are exploitably vulnerable native plants likely to become threatened in the near future throughout all or a significant portion of their ranges within the State if causal factors continue unchecked.

- Adiantum pedatum*, Maidenhair Fern
- Asplenium platyneuron* var. *platyneuron*, Ebony Spleenwort
- Asplenium trichomanes* ssp. *trichomanes*, Maidenhair Spleenwort
- Athyrium filix-femina* ssp. *angustum*, Lady Fern
- Botrychium dissectum*, Cut-leaf Grape Fern
- Cornus florida*, Flowering Dogwood
- Calopogon tuberosus* var. *tuberosus*, Grass Pink Orchid
- Chelone glabra*, Turtlehead
- Conopholis americana*, Squawroot
- Cornus florida*, Flowering Dogwood
- Cypripedium acaule*, Pink Ladyslipper
- Cypripedium parviflorum* var. *makasin*, Small Yellow Ladyslipper
- Cypripedium parviflorum* var. *pubescens*, Yellow Ladyslipper
- Cypripedium reginae*, Showy Ladyslipper
- Drosera rotundifolia* var. *rotundifolia*, Sundew
- Dryopteris carthusiana*, Spinulose Wood Fern
- Dryopteris cristata*, Crested Wood Fern
- Dryopteris intermedia* ssp. *intermedia*, Fancy Fern
- Dryopteris marginalis*, Marginal Wood Fern
- Epigaea repens*, Trailing Arbutus
- Gentiana linearis*, Closed Gentian
- Gentianella quinquefolia* ssp. *quinquefolia*, Stiff Gentian
- Gentianopsis crinita*, Fringed Gentian
- Goodyera pubescens*, Downy Rattlesnake-plantain
- Huperzia lucidula*, Shining Firmoss
- Ilex verticillata*, Black Alder
- Juglans cinerea*, Butternut
- Lilium canadense* ssp. *canadense*, Canada Lily
- Lobelia cardinalis*, Cardinal-flower
- Lycopodium clavatum*, Running Cedar
- Matteuccia struthiopteris*, Ostrich Fern
- Mertensia virginica*, Virginia Bluebells
- Monarda didyma*, Bee-balm
- Osmunda cinnamomea*, Cinnamon Fern
- Osmunda claytoniana*, Interrupted Fern
- Osmunda regalis* ssp. *spectabilis*, Royal Fern
- Parnassia glauca*, Grass-of-parnassus
- Phegopteris hexagonoptera*, Broad Beech Fern
- Platanthera dilatata* var. *dilatata*, Bog-candle Orchid



Cypripedium reginae, Showy Ladyslipper; Bard Prentiss



Cypripedium parviflorum var. *pubescens*, Yellow Ladyslipper; Bard Prentiss



Cypripedium parviflorum var. *makasin*, Small Yellow Ladyslipper; Bard Prentiss



Drosera rotundifolia var. *rotundifolia*, Sundew; Bard Prentiss



Epigaea repens, Trailing Arbutus; B. Prentiss

Platanthera grandiflora, Large Purple Fringed Orchid
Platanthera lacera, Ragged Fringed Orchid
Platanthera orbiculata, Large Round-leaved Orchid
Platanthera psycodes, Small Purple Fringed Orchid
Polystichum acrostichoides, Christmas Fern
Rhododendron periclymenoides, Pinkster
Sanguinaria canadensis, Bloodroot
Sarracenia purpurea, Pitcher-plant
Spinulum annotinum, Bristly Clubmoss
Spiranthes cernua, Nodding Lady's-tresses
Spiranthes lacera var. *lacera*, Slender Ladies-tresses Orchid
Spiranthes romanzoffiana, Hooded Lady's-tresses
Thelypteris noveboracensis, New York Fern
Thelypteris palustris var. *pubescens*, Marsh Fern
Trillium erectum, Purple Trillium
Trillium grandiflorum, White Trillium
Trillium undulatum, Painted Trillium
Woodsia obtusa spp. *obtusata*, Blunt-lobed Woodsia
Woodwardia virginica, Virginia Chain Fern



Eriophorum gracile,
Slender Cottongrass; BP



Gentianopsis crinita,
Fringed Gentian; BP

The following list contains plants known to occur in the Town of Dryden and identified by local botanists as “rare” or “scarce” in the Cayuga Lake Basin (see Wesley, F. R., S. Gardescu, and P.L. Marks. 2008. Vascular Plant Species of the Cayuga Region of New York State. eCommons Digital Repository at Cornell University. <https://ecommons.cornell.edu/handle/1813/9413>); or known to be rare or scarce in the Town of Dryden. These species are not included in the list of protected plants for New York State, but should be given special consideration and protection where they occur in the Town of Dryden. For this list, English names are from the USDA Plants Database (<http://www.plants.usda.gov/>).

Abies balsamea, Balsam Fir
Adlumia fungosa, Allegheny Vine
Asarum canadense, Canadian Wildginger
Comptonia peregrina, Sweet Fern (a small shrub, not a fern)
Eriophorum callitrix, Arctic Cottongrass
Eriophorum gracile, Slender Cottongrass
Eriophorum viridi-carinatum, Thinleaf Cottonsedge
Larix laricina, American Larch
Menyanthes trifoliata, Buckbean
Monotropa hypopithys, Pinesap
Orobanche uniflora, One-flowered Broomrape (Cancer-root)
Phlox divaricata, Wild Blue Phlox
Picea mariana, Black Spruce
Castanea dentata, American Chestnut



Gentiana linearis, Closed Gentian; B. Prentiss



Goodyera pubescens,
Downy Rattlesnake-
plantain; Bard Prentiss

Animals of Conservation Concern (Species of Greatest Conservation Need)

Species listed here are those identified as “Species of Greatest Conservation Need,” (SGCN) by the New York State Department of Environmental Conservation (NYSDEC) in 2015 (see <http://www.dec.ny.gov/animals/7179.html>) as part of its State Wildlife Action Plan (plants were not included). Species listed here are known to occur or likely to occur within the Town of Dryden. For birds, only those species known to

breed or likely to breed in the Town of Dryden are listed. The list, as promulgated by NYSDEC, includes many additional bird species that likely migrate through Dryden in Spring or Fall. Though included in the NYSDEC list, fish species are not listed here because of lack of current knowledge of their site-specific occurrence within waters of the Town of Dryden. Museum specimens of fish can be found in the Cornell University Museum of Vertebrates (<http://www.cumv.cornell.edu/>).



Ilex verticillata, Winterberry; Bard Prentiss

The NYSDEC list also includes many insect species on its list. Except for damselflies and dragonflies, no other insects are listed for the Town of Dryden, because of limited site-specific knowledge (the American Rubyspot, a damselfly, is an exception). Information about damselflies and dragonflies likely to occur in the Town of Dryden is from *Where to Find Damselflies and Dragonflies in the Cayuga Lake Region and the Vicinity* (2014), by Meena Haribal, and is based upon their documented occurrences in nearby areas. More field work needs to be done to establish occurrences of damselflies and dragon flies in Dryden, many of which are important indicators of the health of streams, lakes, and wetlands. The English and scientific names used here are the same as those found on the web site, though they may not always agree with either older or more recent names. In preparation of this list, the assistance of Bard Prentiss, an experienced field naturalist, conservationist, and former Conservation Board member, is greatly appreciated.



Platanthera grandiflora, Large Purple Fringed Orchid;

The status of the following species is known and conservation action is needed in the next ten years. These species are experiencing a population decline, or have identified threats that may put them in jeopardy, and are in need of timely management intervention or they are likely to reach critical population levels in New York.

Amphibians

Four-toed Salamander, *Hemidactylum scutatum*

Reptiles

Wood Turtle, *Glyptemys insculpta*

Woodland Box Turtle, *Terrapene Carolina*

Birds

Black Duck, *Anas rubripes*

Brown Thrasher, *Toxostoma rufum*

Bobolink, *Dolichonyx oryzivorus*

Canada Warbler, *Cardellina canadensis*

Golden-winged Warbler, *Vermivora chrysoptera*

Eastern Meadowlark, *Sturnella magna*

Grasshopper Sparrow, *Ammodramus savannarum*

Henslow's Sparrow, *Ammodramus henslowii*

Horned Lark, *Eremophila alpestris*

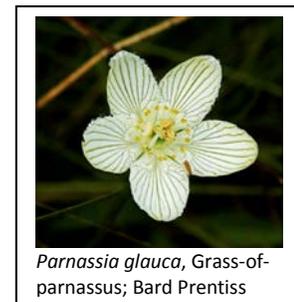
Upland Sandpiper, *Bartramia longicauda*

Vesper Sparrow, *Pooecetes gramineus*

Yellow-breasted Chat, *Icteria virens*



Monarda didyma, Bee-balm; Bard Prentiss



Parnassia glauca, Grass-of-parnassus; Bard Prentiss



Phlox divaricata, Wild Blue Phlox; Bard Prentiss

Mammals

- Eastern Pipistrelle, *Perimyotis subflavus*
- Little Brown Myotis, *Myotis lucifugus*
- Northern Long-Eared Bat, *Myotis septentrionalis*

The status of the following species is known and conservation action is needed. These species are experiencing some level of population decline, have identified threats that may put them in jeopardy, and need conservation actions to maintain stable population levels or sustain recovery.

Dragonflies and Damselflies

- American Rubyspot, *Hetaerina American*
- Arrowhead Spiketail, *Cordulegaster obliqua*
- Comet Darner, *Anax longipes*
- Cyrano Darner, *Nasiaeschna pentacantha*
- Dusky Dancer, *Argia translata*
- Lyre-tipped Spreadwing, *Lestes unguiculatus*
- Mocha Emerald, *Somatochlora linearis*
- Spatterdock Darna, *Rhionaeshna mutata*

Amphibians

- Common Mudpuppy, *Necturus maculosus*

Reptiles

- Eastern Black Racer, *Coluber constrictor*
- Eastern Ratsnake, *Pantherophis alleghaniensis*
- Smooth Greensnake, *Opheodrys vernalis*
- Snapping Turtle, *Chelydra serpentina*

Birds

- American Bittern, *Botaurus lentiginosus*
- American Kestrel, *Falco sparverius*
- American Woodcock, *Scolopax minor*
- Black-billed Cuckoo, *Coccyzus erythrophthalmus*
- Black-throated Blue Warbler, *Setophaga caerulescens*
- Blue-winged Warbler, *Vermivora cyanoptera*
- Louisiana Waterthrush, *Parkesia motacilla*
- Northern Goshawk, *Accipiter gentilis*
- Northern Harrier, *Circus cyaneus*
- Pied-billed Grebe, *Podilymbus podiceps*
- Prairie Warbler, *Setophaga discolor*
- Red-shouldered Hawk, *Buteo lineatus*
- Ruffed Grouse, *Bonasa umbellus*
- Scarlet Tanager, *Piranga olivacea*
- Wood Thrush, *Hylocichla mustelina*

Mammals

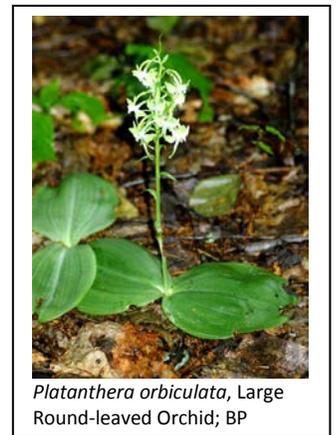
- Eastern Red Bat, *Lasiurus borealis*
- Hoary Bat, *Lasiurus cinereus*
- Silver-haired Bat, *Lasionycteris noctivagans*



Platanthera dilatata var. *dilatata*, Bog-candle orchid; BP



Platanthera grandiflora, Large Purple Fringed Orchid; BP



Platanthera orbiculata, Large Round-leaved Orchid; BP



Platanthera orbiculata, Large Round-leaved Orchid; BP



Platanthera psychodes, Small Purple Fringed Orchid; Bard Prentiss



Sarracenia purpurea, Pitcher-plant; Bard Prentiss



Spiranthes cernua, Nodding Lady's-tresses



Platanthera lacera, Ragged Fringed Orchid; Bard Prentiss



Lobelia cardinalis, Cardinal-flower; Bard Prentiss



Spiranthes lacera var. *lacera*, Slender Ladies-tresses Orchid; Bard Prentiss



Spiranthes romanzoffiana, Hooded Lady's-tresses; BP



Sanguinaria canadensis, Bloodroot; B. Prentiss



Trillium grandiflorum, White Trillium; Bard Prentiss



Trillium undulatum, Painted Trillium; Bard Prentiss



Adlumia fungosa, Allegheny Vine; BP



Trillium erectum, Purple Trillium; BP

Appendix C

A Short History of the Town of Dryden Conservation Board

Town of Dryden Local Law No. 4 of the year 2000 created the Conservation Advisory Council (CAC). Among the responsibilities of the CAC was preparation of an inventory of the open spaces of the Town of Dryden. That inventory was completed in 2003 and submitted to the Dryden Town Board. Upon completion and submission of the open space inventory, the CAC was eligible to be designated as the Town of Dryden Conservation Board.

Local Law No. 1 of the year 2004 designated the CAC as the Town of Dryden Conservation Board (CB). That Local Law provided that the Board shall: “Adopt rules and procedures for its meeting and matters referred to it.” Those Rules and Procedures mirror provisions of the CB enabling legislation. The CB Rules and Procedures were submitted and approved unanimously by the Dryden Town Board at its meeting on 16 February 2012.

The Conservation Board consists of nine members, appointed by the Town Board. The term of appointment is for three years. Persons residing within the Town of Dryden, who are interested in the improvement and preservation of environmental quality, are eligible for appointment as members of the Conservation Board. Vacancies on the Board are filled in the same manner as the original appointment. The Chair of the Board is appointed annually by the Town Board, usually in consultation with members of the Conservation Board.

Rules and Procedures of the Board can be found at
[http://dryden.ny.us/Conservation Board Files/CB Rules Procedures.pdf](http://dryden.ny.us/Conservation_Board_Files/CB_Rules_Procedures.pdf)

Among significant actions by the CAC and the CB, are the following, which can be viewed on the Town of Dryden web site at the addresses indicated (as of March 2017). Note that web addresses (URLs) can be changed and the addresses for the sites listed below may change at some future date.

“Open Space Inventory of the Town of Dryden,” 15 May 2003:
<http://www.dryden.ny.us/Downloads/OpenSpaceInventory.pdf>

“Methods and Selection Criteria for Land Protection and Acquisition,” 30 December 2014:
<http://dryden.ny.us/wp-content/uploads/2017/01/Methods-Criteria-for-Land-Protection-12-30-14.pdf>

“Parks and Trails Maintenance Guidelines,” 31 March 2015:
<http://dryden.ny.us/wp-content/uploads/2017/01/Trail-Maintenance-Guidelines-3-31-15.pdf>

Comments on DEC’s “Twin Sheds Unit Management Plan” for the Hammond Hill and Yellow Barn State Forests, 3 April 2013:
<http://dryden.ny.us/board-commission-list/conservation-board/twin-sheds-unit-management-plan/>