Village of Lansing, NY
Natural Resources Inventory

Village of Lansing
Natural Resources Inventory

Acknowledgements

This Natural Resources Inventory is a Village of Lansing-specific, adapted, revised, and updated version of the Tompkins County Natural Resources Inventory (2001) with new sections added, used with permission from the Tompkins County Planning Department. The inventory was prepared by Rachel Zevin, Climate Smart Communities Coordinator, and reviewed by her successor, Jerry Sheng, CSC Coordinator, both with Cornell Cooperative Extension Tompkins County. The original template of this document was created by Sky Hart from Cornell University. Feedback and proposed edits were provided by the Village of Lansing CSC Task Force members (Ronny Hardaway, Simon Moll, Drew Riedl, Carolyn Greenwald, and Lynn Leopold) for the original template. The data used in this Natural Resources Inventory was the most up-to-date information available as of Fall of 2022, and much of it was provided by the Tompkins County GIS Division. Maps were prepared by Rachel Zevin.

Executive Summary

This Natural Resources Inventory (NRI) describes the natural resources of the Village of Lansing. The inventory highlights relevant data and interprets the results according to the New York Department of Environmental Conservation (DEC) and the Hudson River Estuary Program.

The primary purpose of the NRI is to inform community members and municipal officials with an awareness of the Village's natural resources, and the secondary purpose of the document is to provide natural resource awareness for municipal planning, including future Village comprehensive plans and building and zoning regulations. It can aid in land-use planning, in reviewing proposed development plans, in completing environmental assessments, and in mitigating the impacts of climate change on the Village of Lansing.

There is increasing evidence that climate change impacts are beginning to cause major damage and devastation to communities across the globe and locally within New York State.

Regional climate is increasingly moving towards unpredictable extremes, and governments cannot rely on historical weather patterns to inform management decisions for future governance. Measures must be taken to avoid facing the worst of the threatening climate change projections and their effects on our health and safety. These measures fall into two categories: mitigation and adaptation. Mitigation refers to reducing greenhouse gas emissions that escalate climate change, while adaptation refers to changing our personal and governmental practices to protect vulnerable resources from the consequences of climate-related damage.

The NRI describes the local bedrock and surficial geology, soils, topography, and slopes. Bedrock and surficial geological qualities significantly impact the construction, development, and maintenance of infrastructure and public goods (sewers, water supply sources, roads, bridges, etc.). Soil texture and drainage impact local agriculture, construction, and infrastructure engineering. The Village slopes down westward to Cayuga Lake, and the descent increases rapidly in western areas adjacent to the lake. The Village's streams have also created small valleys with increased slopes. These slopes and topographical features can increase the cost of construction and increase risk from flooding and erosion. Communities located in the down-slope or low-lying areas are most vulnerable to flooding and are likely to be affected by extreme weather patterns from climate change.

The NRI describes threats to surface water and ground water in the Village, including watersheds, streams, floodplains, and wetlands. Threats to the Village's water bodies include both point-source (single, known source of pollution, like discharge from a pipe) and non-point-source (pollution collected in runoff that is difficult to assign to a single source).

The inventory concludes with land cover, habitats, and wildlife descriptions, including unique natural areas, one agricultural parcel, open space and recreation areas, and walking paths. Due to increasing extreme weather patterns, it is important that the Village of Lansing carefully plan development and future land use to prevent unnecessary disturbance to these areas. It is important to consider how the land cover might change with the increasing temperatures and how, as a result, land use and development might be affected.

Contents

Introduction

What is a Natural Resources Inventory (NRI)?

In the simplest form, a Natural Resources Inventory (NRI) describes the natural resources of an area, highlights relevant data, and interprets the results, according to the New York DEC and Hudson River Estuary Program. Depending on the community, an NRI could also include historic resources. Oftentimes, the scope and level of detail is determined by the community preparing the document. While the simplest version is just a list of existing resources, the more complex NRIs could include detailed analysis of each existing resource. As the primary purpose of an NRI is to act as an informational source to community members and municipal officials, the secondary purpose of the document is to provide the building blocks for natural resource awareness in local and regional comprehensive plans, as well as building and zoning regulations. NRIs provide information that forms a basis for municipal planning. In other words, the NRI acts as a regional atlas that could be used when updating or developing local regulations. It can assist in the process of land use planning, review of proposed development plans, and completing environmental assessment.

Why Should Natural Resources be Protected?

Protecting environmental quality is a matter of choices and tradeoffs. There may be negative consequences from natural resource degradation, including wildlife displacement, loss of recreation corridors and scenic vistas, surface and groundwater contamination, increased pervasiveness of invasive species, and increased erosion and flooding. Decisions regarding development, infrastructure (new building and maintenance), and other land management issues will benefit from consulting the Village's NRI. Much development is irreversible, which makes good planning very important. Long-term planning is one way to minimize the short-term exploitation of a resource base resulting from "quick fixes". Planning at the local, regional, and state levels provides individual municipalities with a rational system for guiding land management and development with respect to the distribution and value of natural resources.

This document can serve as a guide for the municipality and local people of interest (including developers and farmers) when making land management decisions.

Village of Lansing

The Village of Lansing is located within the southern part of the greater Town of Lansing in Tompkins County, along the southeastern side of Cayuga Lake. The Village encompasses about three square miles and is significantly more urbanized than the rest of the larger township. The municipality is also near the City of Ithaca and Cornell University. It has significantly changed over time with the development and expansion of the Ithaca Mall and continuous urbanization. The entire Village lies within the Cayuga Lake Watershed and is traversed by more than a dozen minor streams. Six Unique Natural Areas (UNAs) are located within the Village. With increasing extreme weather events, the Village has been susceptible to flash floods and other environmental hazards that have led to threatened natural resources in parts of the municipality.

Climate Change

Climate encompasses the fundamental meteorological characteristics defining where we live. These are the long-term trends in seasonal weather patterns that, in turn, determine the species composition of our natural landscapes, waterways, and agricultural practices. Climate can also dictate business and recreational opportunities. Weather, by contrast, describes the day-to-day changes in meteorological conditions for a location.

Historically, while weather varied, climate rarely exceeded the norms expected within the climatic region. However, since the mid-20th century, the planet's average temperature has been rising as warming increases unevenly across the world. In addition, drought and rainfall patterns are changing at an unprecedented pace. These climatic changes have been largely attributed to the burning of fossil fuels (e.g., coal, oil, and natural gas) and other human activities that have increased the level of carbon dioxide and other heat-trapping greenhouse gases in the atmosphere.

The changing climate is causing sea levels to rise as glaciers and polar ice melt, disrupting growing seasons as precipitation patterns and temperatures change, and increasing extreme weather events including heat waves, droughts, and floods. There is growing evidence of climate change, and its impacts are beginning to cause major damage and devastation to communities across the globe and locally within New York State. This already impacts how and where we live, from farmers growing different crops to people leaving their no-longer-habitable homes. In addition, warmer temperatures can have adverse effects on health, for example, by increasing plants' pollen production and the formation of ground-level ozone, which in turn can worsen respiratory conditions such as asthma and allergies, as well as by creating a more hospitable environment for disease-carrying insects such as mosquitoes and ticks.

Regional climate is increasingly moving towards extremes, and the "new normal" is undefined. No longer can governance rely on historical weather patterns of the past to inform management decisions.

Addressing Climate Change

To avoid facing the worst of these climate change projections, we can take measures to address climate change. These measures fall into two categories: mitigation and adaptation. Mitigation refers to the reduction of greenhouse gas emissions, while adaptation refers to changing our practices to match new or inevitable climate conditions. Examples of mitigation strategies include reducing energy use by taking actions such as turning off electronics when they are not in use or switching to energy-efficient LED lightbulbs; switching to renewable energy sources such as solar or hydro power; reforestation to sustainably capture carbon dioxide emissions; and taking the bus, walking, biking, or carpooling instead of driving. Adaptation refers to changing our personal and governmental practices to protect vulnerable resources from the consequences of climate-related damages. Examples of adaptation strategies include relocating facilities away from areas prone to flooding, creating cooling centers for people to take shelter in on extremely hot days, and reducing water use during droughts.

Using a combination of mitigation and adaptation strategies at the individual, institutional, and municipal levels is important. Climate change cannot be prevented entirely even if humans were to cease greenhouse gas emissions, as the greenhouse gases currently in the atmosphere will remain there for decades or even centuries. Therefore, adaptation to a different climate is necessary. However, we can avoid experiencing the worst of the projections by reducing greenhouse gas emissions through mitigation strategies so that existing issues will not be exacerbated.

Previous Climate Characteristics and Recent Climate Change Impacts

The climate of the Village of Lansing and its previous seasonable weather patterns are similar to Tompkins County and the larger Northeastern United States. New York's Climate Aid report (2011, 2014) describes the average climate of the region, from 1900- 2012, as "Humid Continental" with the following attributes. The average annual precipitation for Tompkins County has been approximately 37 inches, most of which occurs between April and November. Historically, precipitation during the warm season has been characterized by relatively short periods of intense precipitation that produce substantial surface runoff and little recharge. Average summer temperatures have ranged from about 60 degrees Fahrenheit (°F) to 68°F, with average daily highs (for any given day but including both daytime and nighttime temperatures) up to 80 degrees in July. The cool season (October through March) has had large, low-pressure weather systems that move northeastward along the Atlantic coast or up the eastern side of the Appalachian Mountains. Storms that formed in these conditions were normally characterized by prolonged periods of steady precipitation in the form of rain, snow, or ice. They tended to produce less surface runoff and more recharge than the summer storms because of their longer duration and occasionally resulted in snowmelt. Winter high temperatures have been between 31°F and 36°F, with average minimum temperatures dipping to 15°F.

The paragraph above details the previously seen climate norms from New York's Climate Aid report, but their results, as well as those of other research groups, have seen evidence that indicated these climate norms are changing. This change is seen in the average

annual temperature rise by 2.4°F in New York State since 1970. In addition, average winter temperatures have increased by over 4.4°F. Climatic change has also resulted in increased precipitation in the winter, and less in the summer. The Northeast region is expecting a ~20 to 30% increase in winter precipitation in upcoming years. This winter precipitation may consist of less snow and more rain due to increases in temperature. All of these climatic changes have direct effects on the health of humans, animals, and plants in New York State.

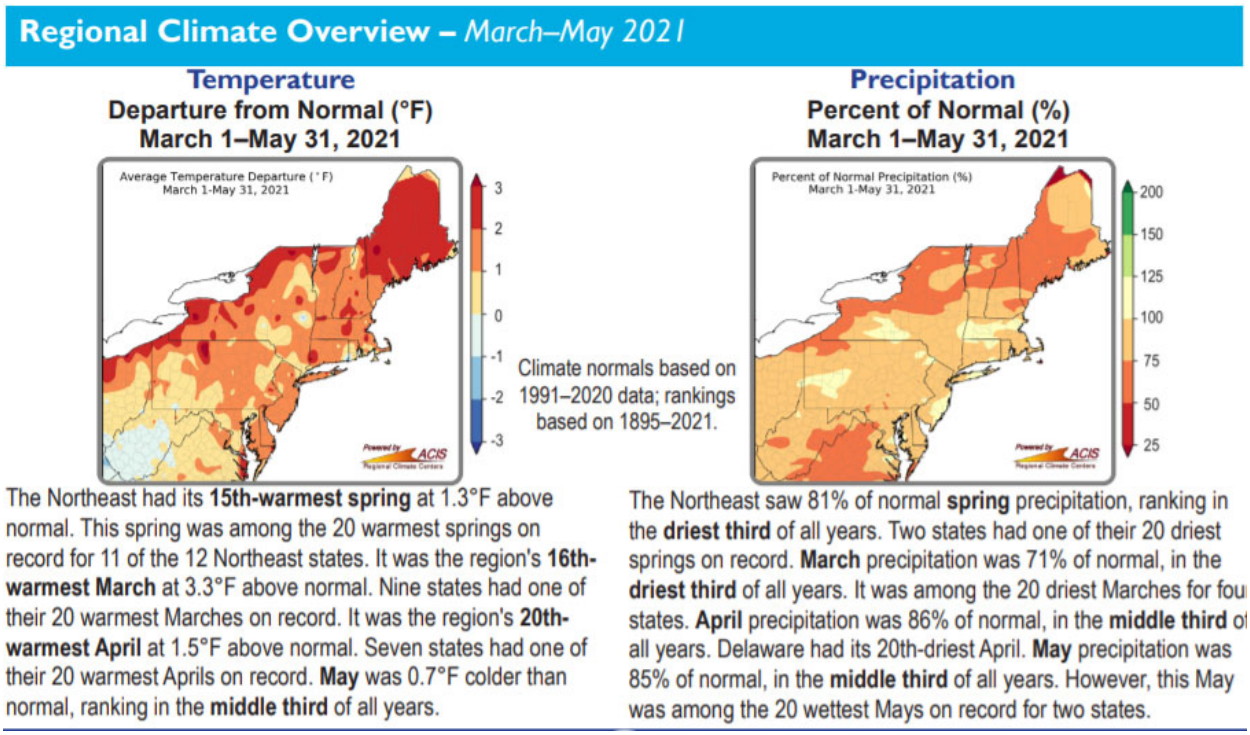


Figure 1: The above image is from the Northeast Regional Climate Center's report on Quarterly Climate Impacts and Outlook for the region from March-May 2021 (the most recent report available as of the writing of this plan). It shows that all regions are recording temperatures above the normal average for that location (on left) and that the Northeast had an extremely dry spring with most areas receiving less precipitation than their location's normal average (on right).

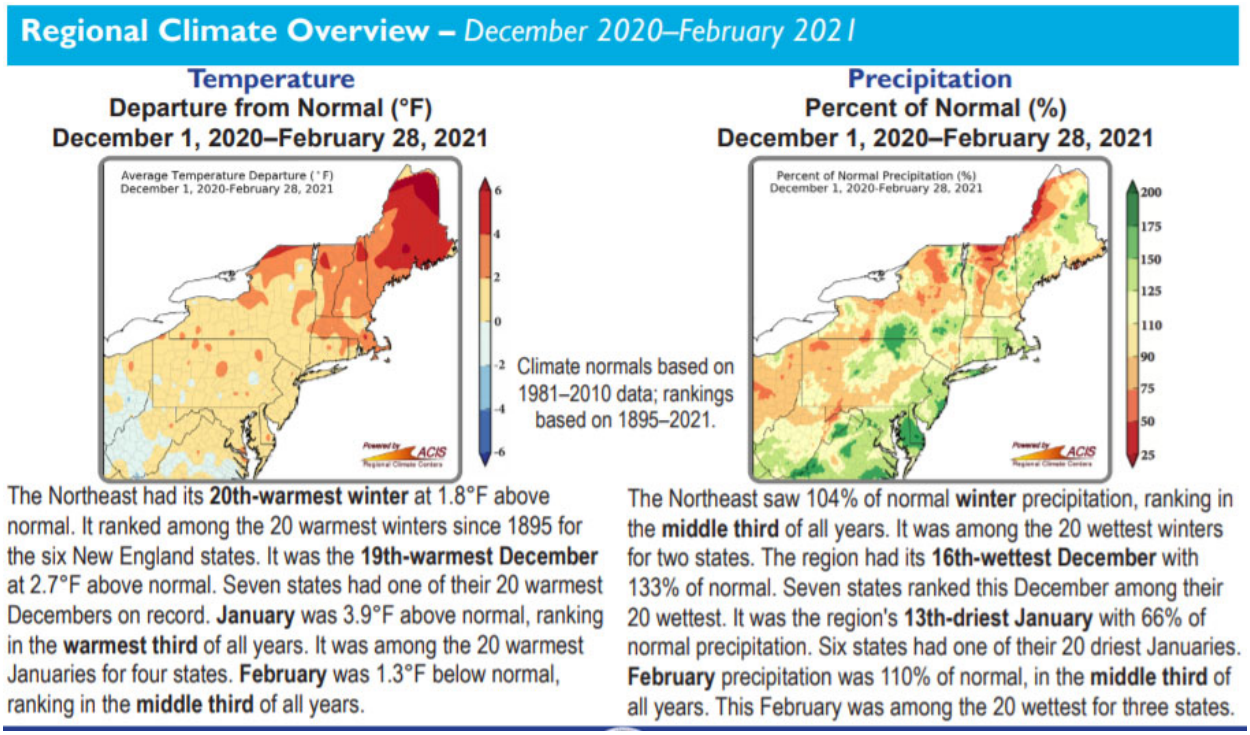


Figure 2: The above image is from the Northeast Regional Climate Center's report on Quarterly Climate Impacts and Outlook for the region from December 2020 -February 2021. Again, it shows that most regions are recording temperatures above the normal average for that location (on left). There is some variance in the precipitation seen across the Northeast. With rising temperatures, more of this precipitation may have formed in rain, rather than traditional snowfall.

Inventory of Resources

Geology and Soils

Bedrock and Surficial Geology

Bedrock is the hard, solid rock beneath surface materials such as soil and gravel, although it can occasionally be exposed at surface level, often along roads or stream beds. Bedrocks were formed millions of years ago and form the foundation of materials and topography within a region.

Shallow bedrock (up to ~ 5 to 10 ft below surface) can significantly impact the construction, development and maintenance of infrastructure and public goods (sewers, water supply sources, roads, bridges, etc.). Determination of specific bedrock qualities are best done on a site-specific basis.

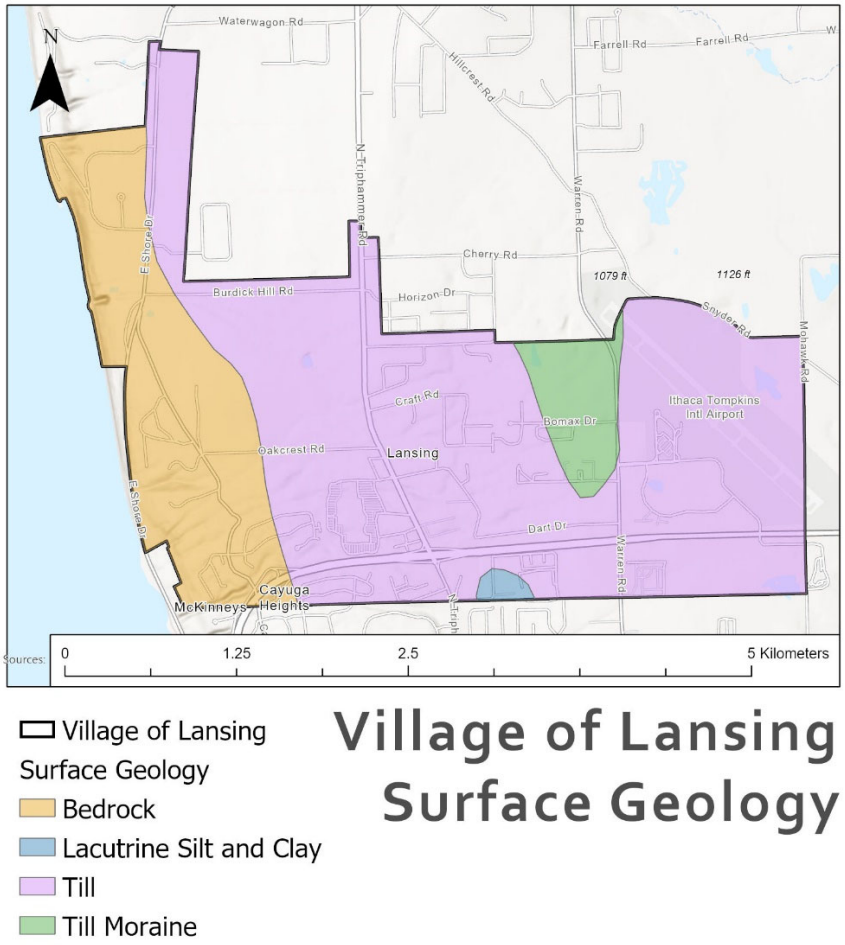
Approximately 550 million years ago, the land that is now the Village of Lansing and the surrounding region was submerged under an ancient sea. Over the course of 325 million years, layers of sediment (sand, mud, salt, and lime) were deposited on the lake bottom and slowly hardened into beds of sedimentary rocks that we now know as sandstone, shale, and limestone. The Village of Lansing lies over the Ithaca Formation (Dg) and is part of the Genesee Group (characterized by limestone, shale and siltstone.)

Surficial geology describes the rocks and unconsolidated materials that lie between the bedrock and the land surface. Surficial geology differs from soils as soils refer to the organic components in these materials, while surficial geology refers only to the rock and mineral components.

The surficial geology of Tompkins County was created from deposits from glaciers receding ~ 12,000 to 25,000 years ago. The rocks and debris originally frozen in the ice were deposited from the glacier melt as it receded. Formations within the surficial geology changed with the rate (fast or slow) of the glacier's recession.

Surficial geology defines much of the characteristics of the materials below surface level. It can impact construction, infrastructure, land use, and agriculture suitability.

The Village of Lansing has four types of surficial geology within its boundaries: Bedrock, Lacustrine Silts and Clay, Till, and Till Moraine (Figure 3). Lacustrine Silts and Clay are generally composed of laminated silt and clay, deposited from lakes formed during the glacial recession. They are high in calcite, have low permeability, form potentially unstable land, and have a variable thickness of up to ~160 ft. Till is formed of poorly sorted materials of varying sizes and textures that were deposited beneath glacial ice. The amount of compaction dictates the permeability of Till and the thickness may vary from ~3 to 160 ft. Till Moraine is similar to Till, but it has more variable sorting and, in general, is more permeable than Till. Till Moraines were typically deposited next to glacial ice and thickness can vary from ~30 to 100 ft.



Village of Lansing Surface Geology

Figure 3: This map of the Village of Lansing's surface geology was created with data from the United States Geological Survey (USGS.) The Village has 4 types of surficial geology, the majority is made up of till (pink), followed by bedrock (orange), till moraine (green), and finally a small amount of Lacustrine silt and clay (blue).

Soils

Soil is a material composed of five ingredients: minerals, soil organic matter, living organisms, gas, and water. The United States Department of Agriculture (USDA) defines twelve major soil texture classifications (sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay). Soil textures are classified by the fractions of sand, silt, and clay in a soil. Classifications are typically named for the primary constituent particle size or a combination of the most abundant particle sizes (sandy clay, silty clay). Loams are soils having roughly equal proportions of sand, silt, and/or clay in a soil sample. Texture affects many soil properties, such as infiltration, structure, porosity, water holding capacity, and chemistry.

Soil drainage refers to a soil's ability to retain water and is influenced by soil texture and organic content. Soils can be broken down into four Hydric Soil Categories (HSC) based on their permeability. HSC ranges from group A (sand, loamy sand, or sandy loam), with low runoff and fast draining, to group D (clay loam, silty clay loam, sandy clay, silty clay, or clay), with high runoff and extremely slow draining.

Soils can impact many human activities including agriculture, construction, and infrastructure engineering. The USDA Natural Resources Conservation Service (NRCS) ranks soils in terms of their capacity to support agriculture. Their rankings range from Class I soils, which are productive and easily worked, to Class VIII soils, which are not suitable for growing crops, pasture, or trees for profit.

Soils maps (Figure 4) can be used to identify areas suitable for development as homes, industry, agriculture, or recreation. They can also help locate sites ideal for septic tanks, roads, bridges, water wells, and other important human infrastructure.

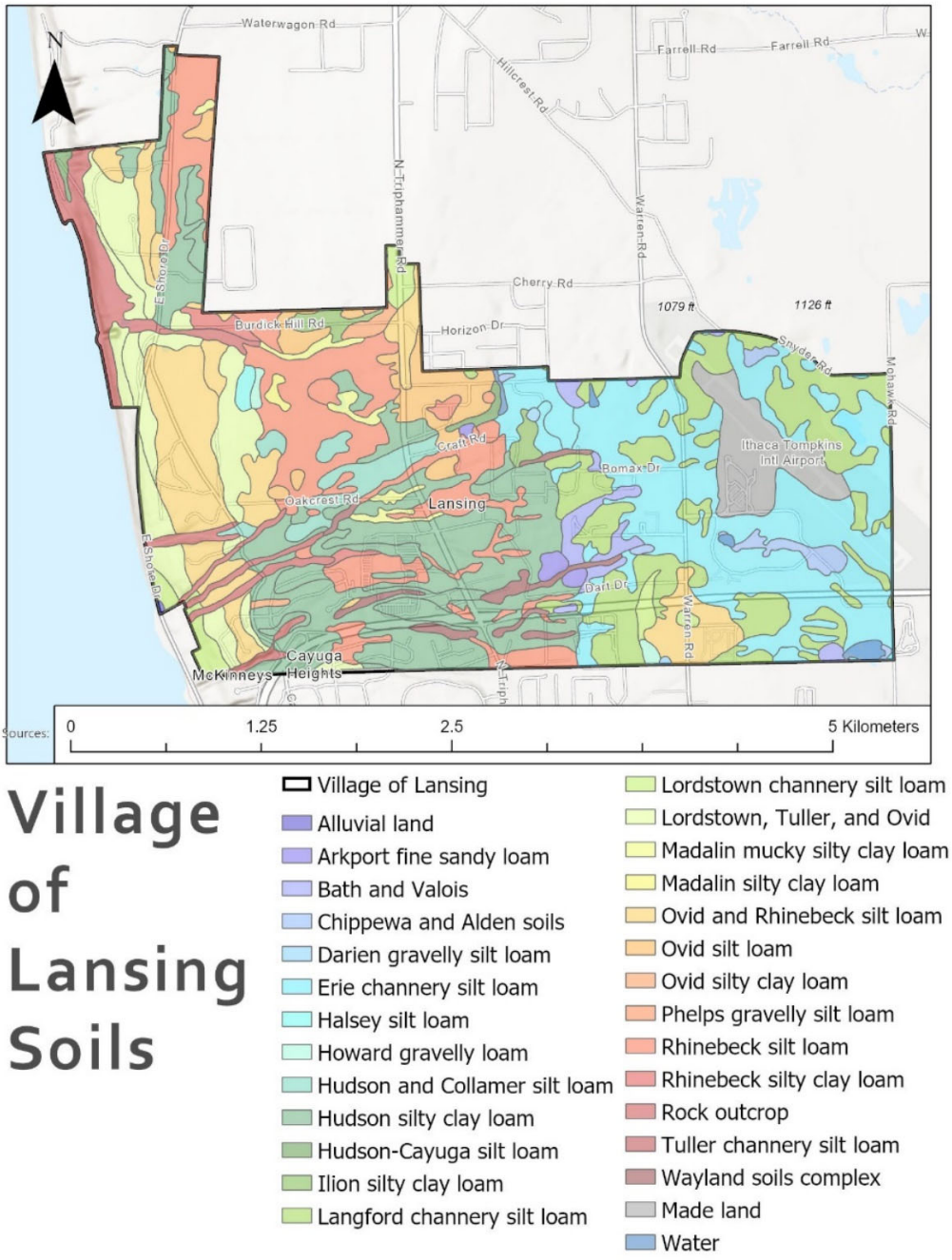


Figure 4: This map of the Village of Lansing's soils was created from the U.S. Department of Agriculture's Natural Resources Conservation Service's Soils Division's U.S. General Soil Map. Ovid and Rhinebeck silt loam and silty clay loam take up about 1.2 sq miles of the total 4.63 sq miles of land within the Village, mostly lying in the western portion. Hudson silt clay loam and Hudson soil mixes sum to approximately 0.9 sq miles again mostly found in the western part of the Village. Erie channery silt loam is the predominant soil type in the eastern part of the town, with a total of about 0.8 sq miles. The remaining 1.73 sq miles is a mix of mostly different types of silty or clay loams.

Slopes/ Topography

Topography is the measurement of elevation, while slope is the percent change in elevation over a certain distance. Together they describe the shape and relief of landscapes. Topography may be measured with lines that connect points representing the same elevation; these are called topographic contours. Slope is measured by calculating the difference in the elevation from one point to another divided by the lateral distance between those points. Topographic data can also be used to create a model of the land's surface, called a digital elevation model (DEM).

Slope and topography are important to consider when making land use decisions. Slope can increase the cost of construction and increase risk from natural disturbance from flooding and erosion. Flash floods can easily occur in streams and rivers located in valleys/ravines, even with moderate precipitation. As a result, communities located in these low-lying areas are most likely to be affected by extreme weather patterns. Thus, it is important to consider topography when determining communities that are most vulnerable to flooding.

The Village of Lansing has its highest elevations and lowest slopes in the eastern area of the Village (Figure 5). The Village slopes down westward to Cayuga lake. The descent increases rapidly in western areas adjacent to the lake. Lansing's streams have also created small valleys with increased slopes.

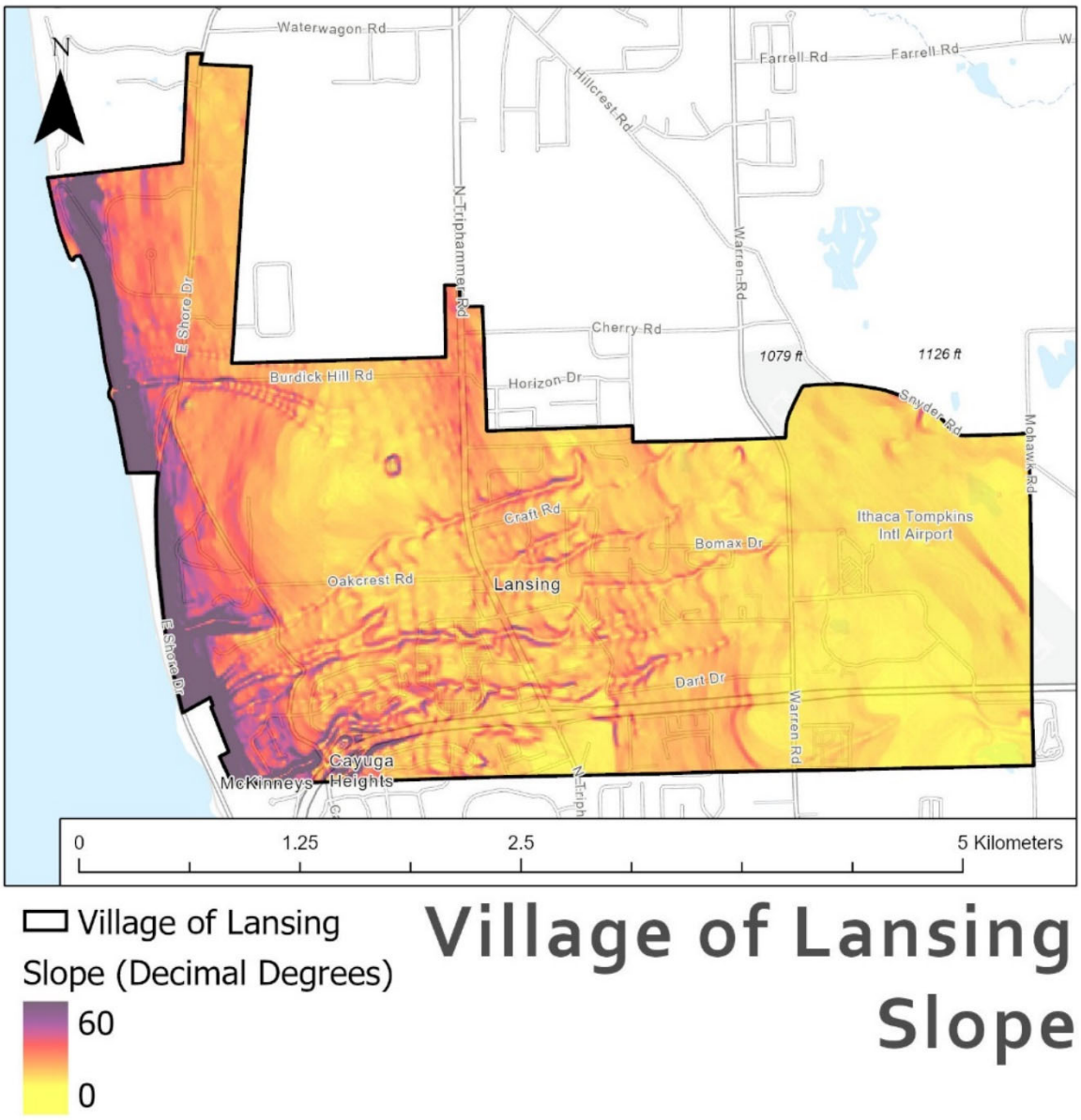


Figure 5: This map of the Village of Lansing's slopes was created from the USGS Digital Elevation Model (DEM). Slope was calculated on 1 by 1m square cell size. Areas of low slope are shown in bright yellow and darken to deep purple with increasing slope values.

Surface Water

Surface water bodies are connected to public health as well as the economic and environmental well-being of the local area. Quality and quantity of local surface freshwater can impact the economy and ecology in many ways including, but not limited to, drinking water, flooding, recreation, and future economic growth.

Threats to the Village of Lansing's water bodies include both point source (single known source of pollution, like discharge from a pipe) and nonpoint source (pollution collected in runoff that is difficult to assign to a single source). Some nonpoint sources of pollution are construction, agriculture, and paved surface runoff.

There are many obvious benefits to protecting waterbodies and their surrounding banks/riparian buffers; with the constantly changing climate conditions it is important to understand the critical role of natural water networks and how they can protect a community. The following is meant to be an incentive to encourage preservation and protection, and thus increase the community's resiliency to future climate-related events.

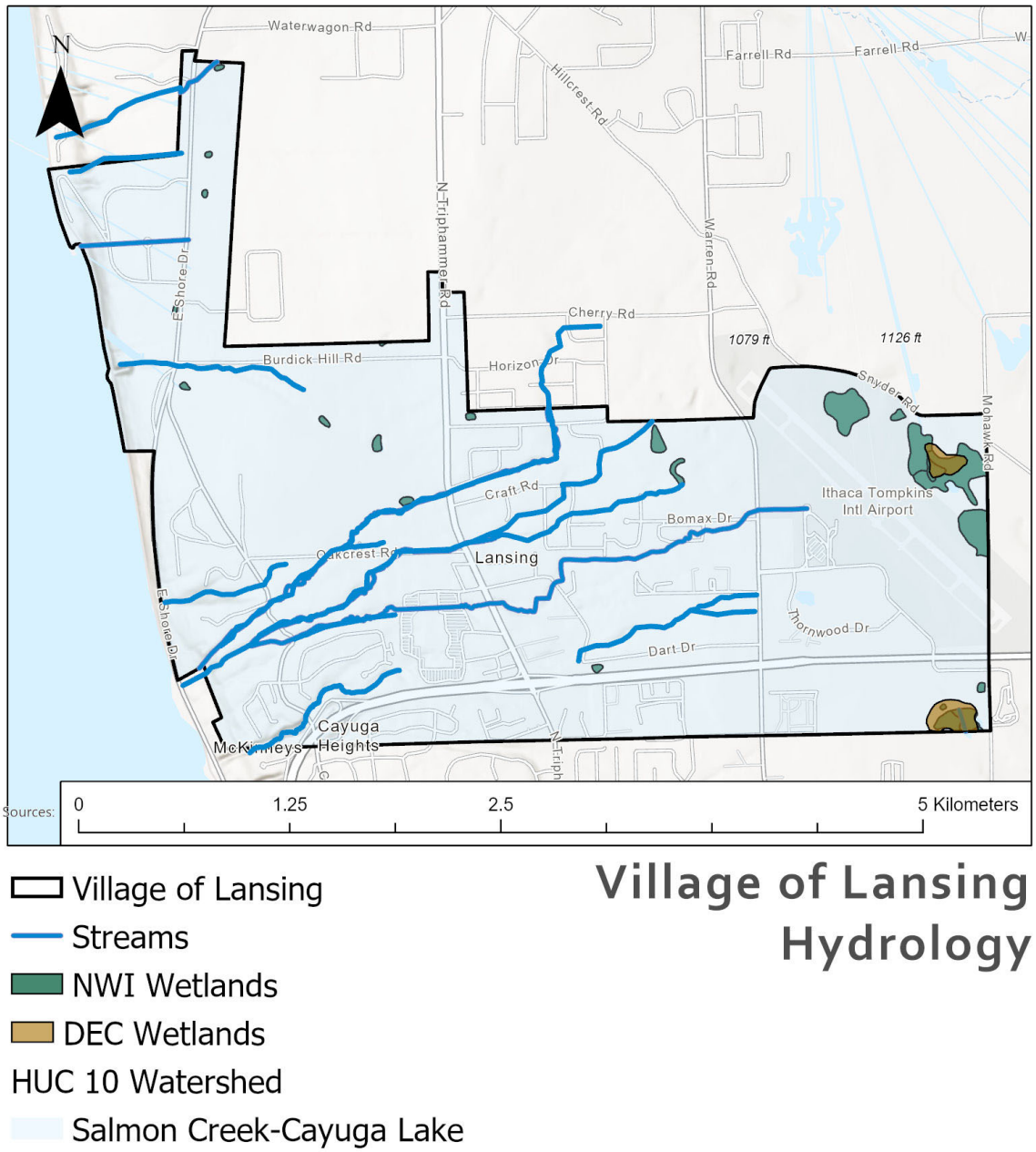


Figure 6: This map of the Village of Lansing's surface hydrology was created from the USGS NHD and New York State DEC. The entirety of the Village's area lies in the Salmon Creek watershed (light blue). The National Wetlands Inventory designated wetlands are shown in teal. Streams are shown in dark blue and are flowing northeast to southwest.

Watersheds

Watersheds encompass the total land area where overland runoff will contribute water to a given point. The size of a watershed (also called a drainage basin or catchment) is defined

on several scales—referred to as its Hydrologic Unit Codes (HUC) based on the geography that is most relevant to its specific area. A watershed can be small, such as a modest inland lake or a single county.

Land use throughout a watershed (or the commercial, industrial, agricultural, and/or residential activities a land area can support) and the availability of reliable water sources within a watershed are directly related. That is, the land use in a particular area is often determined by the availability of reliable water supplies, and land use is a key determinant of the quality, quantity, and availability of local water resources. Because of this dynamic relationship between water and land use, the characteristics of the entire watershed must be considered when addressing water quality and water quantity issues, including such factors as the amount of impervious surface and effectiveness of local land management practices.

Additionally, the critical influence and impact of water on important ecological and economic systems (such as provision of drinking water, flooding, recreation, and future economic growth) make watersheds increasingly common management and planning units. State and federal agencies use and look favorably on water-related management and planning processes that also use the principles and concepts of watershed management.

According to the USGS, the Village of Lansing lies within the Salmon Creek watershed and is adjacent to Cayuga Lake (Figure 6). Cayuga Lake is the second largest Finger Lake and is located in a steep-sloped glacial valley. It is the longest of the eleven Finger Lakes (38.2 miles). Compared to other lakes, Cayuga Lake's water quality is generally good. Water quality standards, particularly levels of pathogenic bacteria as indicated by E. coli, have historically been met for the protection of recreational uses. An exception to this is in the shallow southern tip of the lake (in Tompkins County) where sediment and nutrients loaded from Fall Creek and the Cayuga Inlet result in weed and algal growth that impair summer recreational uses. The Cayuga Lake watershed (which encompasses the nested Salmon Creek watershed) is part of the Oswego River Basin that flows north to Lake Ontario.

Streams

The Village of Lansing's streams (Figure 6) act as tributaries to Cayuga Lake, flowing from higher elevations in the east to the lower western shores of the lake. Past research conducted on Cayuga Lake tributaries found most tributary streams exhibit moderate to high water quality. They also exhibit habitat conditions that support a balanced biological community, as indicated by benthic macroinvertebrate (BMI) analysis. However, levels of pathogenic bacteria exceed the recommended limit for contact recreation (235 colonies E. coli per 100 ml) at most of the surveyed stream locations.

There are many obvious benefits to protecting surface waterbodies and their surrounding banks/riparian buffers; with the constantly changing climate conditions it is important to understand the critical role of natural water networks and how they can protect a community.

Floodplains

Flood Hazard Areas (FHA) are areas that the Federal Emergency Management Agency (FEMA) has determined to be vulnerable to flooding. The Village of Lansing does not have any FHA within its boundaries.

Wetlands

As defined by the US Army Corps of Engineers, "Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Freshwater wetlands commonly include marshes, swamps, bogs, and fens. While some wetlands are easily spotted, others are not as clear because they are dry part of the year.

The DEC classifies and ranks wetlands according to their respective functions, values, and benefits. Of the four classes of wetlands, Class I wetlands are the most valuable and are subject to the most stringent standards. For regulatory purposes, the Army Corps only classifies wetlands as regulated or not regulated based on the presence of wetland hydrology, hydric soils, and hydrophytic vegetation (wetland plants).

Unlike waterbodies, wetland borders can be difficult to delineate. Because wetlands are fragile ecosystems, a 100-foot buffer is legally established by the state around each individual wetland. The boundaries are determined based on three factors: existence of hydrophytic vegetation, hydric soil type, and standing water. In order to be designated as a wetland, usually two or more of the factors must exist. While Figure 6 may represent existing wetlands, their existence and size can continually fluctuate, especially with climate change.

The National Wetlands Inventory has identified ~30 acres of wetlands within the Village of Lansing's boundaries (approximately 1% of all municipal land area). These wetlands are mostly located in the northern and eastern regions of the Village (Figure 6). If a municipal official or community member believes they know of a wetland that is not mapped, the following manual can be used to identify potential new wetlands: Freshwater Wetlands Delineation Manual.

Wetlands are critical, natural ecosystems, and they provide a variety of benefits, such as: filtering harmful toxins, nutrients, and sediment from surface runoff; storing floodwaters and reducing the magnitude of flood events; and providing valuable habitats for a diverse array of flora and fauna, including many rare, threatened, or endangered species. Wetlands function as natural sponges that hold and slowly release surface water, rain, snowmelt, groundwater, and flood waters. Trees, root mats, and other wetland vegetation also slow the speed of flood waters and distribute them over the floodplain. This lowers flood level and power and reduces erosion. A wetland's ability to act as a sponge also acts as a natural water purifier, filtering sediment and absorbing many pollutants in surface waters. In some wetland systems, this cleansing function also enhances the quality of groundwater supplies.

Wetlands also store carbon within their plant communities and soil instead of releasing it to the atmosphere as carbon dioxide. Thus, wetlands help to moderate global climate conditions.

Wetlands are extremely biologically diverse and provide suitable habitat for many species. Wetlands play an integral role in the ecology of a watershed. The combination of shallow water, high levels of nutrients, and primary productivity is ideal for the development of organisms that form the base of the food web and feed many species of fish, amphibians, shellfish, and insects. Many plant species, including several that are threatened or endangered, are dependent on wetland habitat for survival. Many species of birds and mammals rely on wetlands for food, water, and shelter, especially during migration and breeding.

The recreational uses associated with wetlands are also very diverse and include birdwatching, hunting, and fishing, all of which provide direct economic benefits to local communities. Because wetlands are crucially important both economically and environmentally, they are highly regulated by the Army Corps and the DEC.

The Army Corps regulates wetlands under Section 404 of the Clean Water Act and issues wetland permits for the placement of fill or dredge materials and the construction of certain structures in waterways (navigable and non-navigable) and wetlands. Disturbances to wetlands must be mitigated in accordance with Army Corps regulations. The Army Corps permit required for activities within a wetland, and the amount of wetlands mitigation required, vary depending on the type of project proposed and the area of wetland impacted.

The DEC primarily regulates wetlands that are 12.4 acres (5 hectares) or larger in size under the Freshwater Wetlands Act. It protects smaller wetlands if they are considered to have unusual local importance. For any work occurring within a wetland or within 100 feet of a wetland boundary, the DEC requires that a wetlands permit be obtained.

Prior to conducting work in or near a wetland, the Regional DEC office or the Army Corps district office should be contacted to obtain the necessary approvals and permits. Each of these agencies will automatically forward permit applications to the other, and each agency will contact the applicant if additional permits and/or paperwork are needed. If permits are not

obtained or wetlands are improperly altered, the Army Corps and the DEC have the authority to levy fines.

In May 2023, the Supreme Court ruled that isolated wetlands that do not drain directly into navigable waters are no longer protected. Therefore, the fates of small wetlands are in peril nationwide. Because of the many benefits of wetlands described above, the Village should consider continuing to ensure that its wetlands are protected even if they do not flow into navigable waters.

Ground Water

Aquifers are geologic formations beneath ground surface, that store and provide ground water. They are an important source of water for residential, commercial, and industrial use. The Village of Lansing sits on till/bedrock. Bedrock aquifers yield much less water than sand/gravel aquifers. These aquifers may be sufficient to supply individual residences or small farms with water, but the water may be heavily mineralized and/or unreliable.

Land Cover, Habitats, and Wildlife

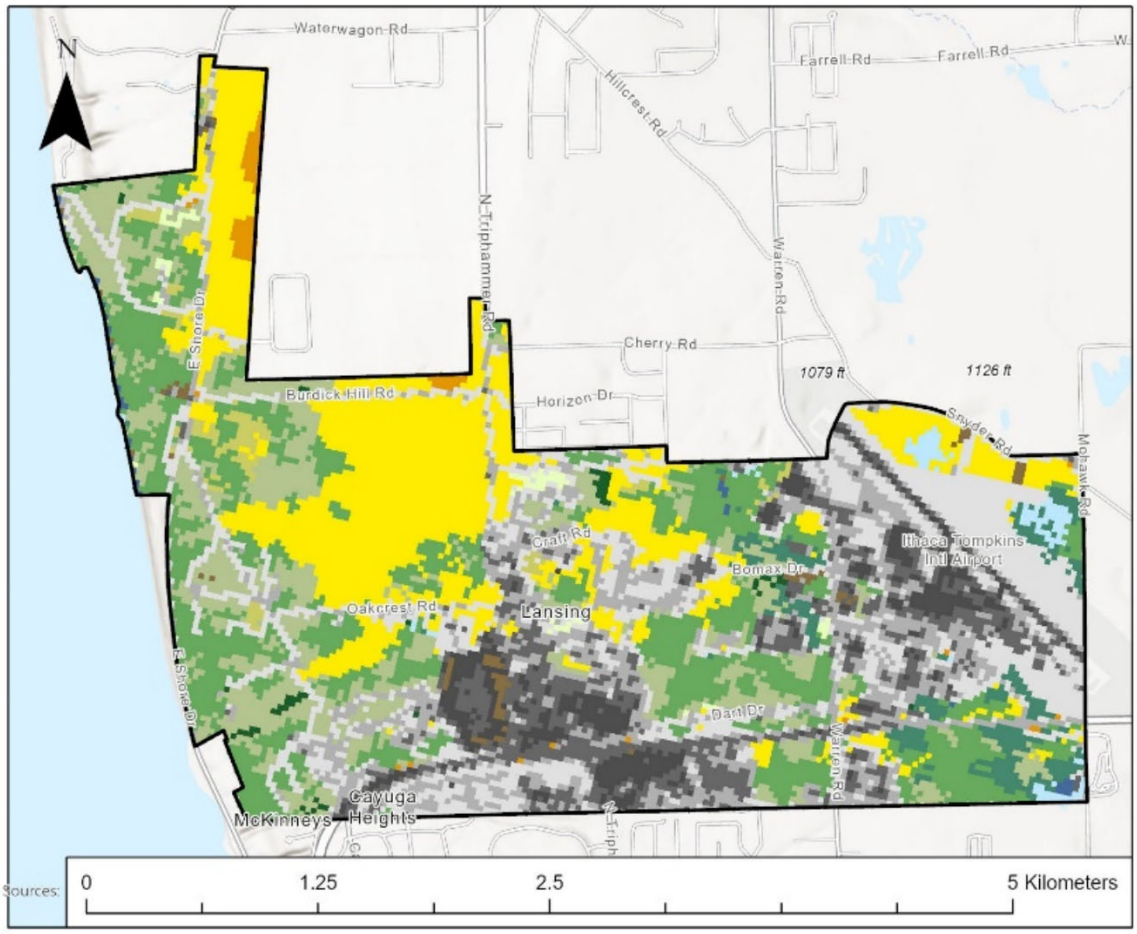
Land Cover

Land cover can contain areas altered for a specific purpose, such as residential, commercial, or industrial use of areas either unaltered or containing natural vegetation or surfaces like rock. Understanding current land cover helps communities guide development and other land management planning.

Due to increasing extreme weather patterns, it is important for a community to carefully plan development and future land use to prevent any unnecessary disturbance to the area. It is also helpful to consider how the land cover will change with the increasing temperatures and how, as a result, land use and development can be affected. According to the USDA, native tree species such as the Sugar Maple are projected to migrate north between now and 2100. In

addition to changing species, the density of forests is expected to thin out over time, causing less ground stability and thus increased potential for landslides. Between 2000 and 2050, the Northeast is expected to have an overall decline in forest and cropland by 7% and 6%, respectively. While it is not possible to predict exactly how the land cover will change over time, it is possible to forecast change by referring to and cross-comparing current with historical land cover maps. Combining land cover data with information on other natural resources in the area will help guide municipal decision making.

Data from the National Land Cover Dataset (NLCD) (Figure 7) indicate that the Village of Lansing's major land cover groups are agriculture (hay/pasture and cultivated crops), forest (deciduous and mixed), and developed (low, medium, and high). Areas of development are located near Route 13, clustered around the Shops at Ithaca (shopping mall) and Ithaca Tompkins International Airport. Much of the agriculture and forests are in the western and northern parts of the Village.



Village of Lansing Land Cover (NLCD)

- Village of Lansing
- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Herbaceuous
- Hay/Pasture
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceuous Wetlands

Figure 7: This map of the Village of Lansing's land cover was created from the USGS NLCD. The NLCD provides land cover at a 30m resolution with a 16-class legend based on a modified Anderson Level II classification system.

Unique Natural Areas

The Unique Natural Areas (UNA) identify places in Tompkins County that contain special natural or cultural features. A Unique Natural Area is a part of the landscape that has outstanding geological and environmental qualities, such as special natural communities, or plants and animals that are rare or scarce elsewhere in the county or region. UNAs are intended to help landowners, municipal governments, and planning boards make the wisest choices possible in balancing development with protection of the rural character and natural beauty. The Village of Lansing has 7 UNAs, representing ~294 acres and ~10% of the Village's total area (Figure 8).

A UNA is not a regulatory designation, and it does not provide legal protection for an area. Instead, it provides an alert to municipal planning and decision-making processes that resources exist that may require modification of proposed activities. The UNA Report, generated by Tompkins County, has specific information on each UNA including location of each UNA (municipality, latitude and longitude, USGS topographic quad, and tax parcels), a map of the UNA, site and vegetation descriptions, reasons for selection, special land-use information (land-use or legal designations, water resources information), conservation information (adjacent land use, sensitivity of site to visitors, evidence of disturbance, management), physical characteristics of each site (slope, elevation, soil types, geological features), and biological characteristics (ecological communities, plant and animal species present) .

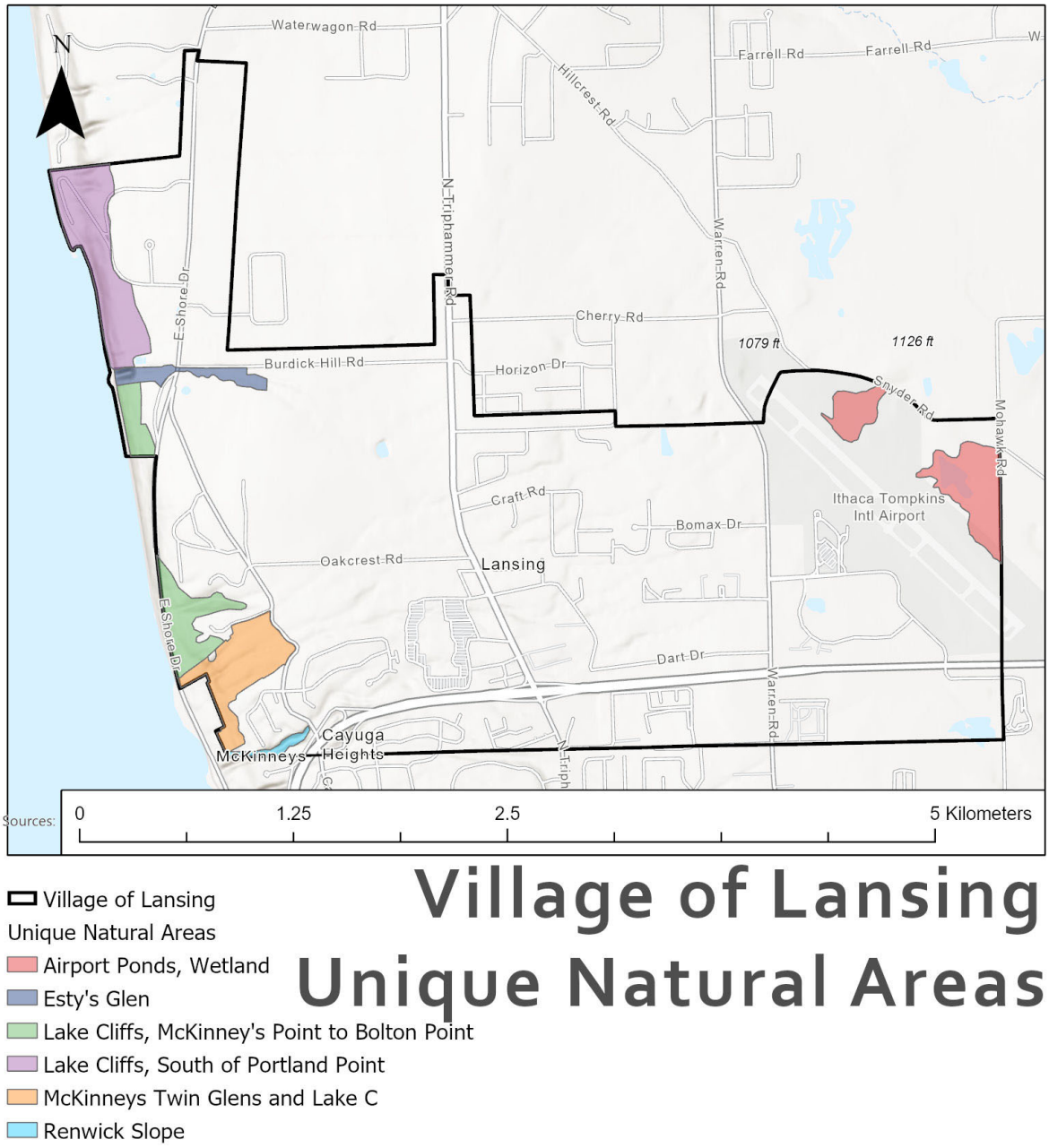


Figure 8: This map of the Village of Lansing's UNAs was created using data from Tompkins County. The Village has 7 UNAs (airport ponds are considered part of two separate UNAs).

Critical Environmental Areas

Critical Environmental Areas are areas in New York State that are designated by a local or state agency to recognize a specific geographical area with one or more of the following characteristics:

- a feature that is a benefit or threat to human health;
- an exceptional or unique natural setting;
- an area with exceptional or unique social, historic, archaeological, recreational, or educational value; or
- an area with inherent ecological, geological, or hydrological sensitivity to change that maybe adversely affected by any physical disturbance.

At this time, the Village of Lansing has no Critical Environmental Areas identified locally or by the New York State DEC.

Rare Plant and Animal Communities, and Significant Natural Communities

According to the New York State DEC, as of 2014, the following table lists potential rare and endangered animals, plants, and significant natural communities (animal assemblages) within the Town of Lansing (including the Village of Lansing).

Common Name	Scientific Name	Group	Subgroup
Blackchin Shiner	Notropis heterodon	Fish	Minnows, Shiners, Suckers
Ashton's Cuckoo Bumble Bee	Bombus ashtoni	Bees, Wasps and Ants	Bees
Waterfowl Winter Concentration Area	Waterfowl Winter Concentration Area	Animal Assemblages	Animal Assemblages
American Ipecac	Gillenia stipulata	Flowering Plants	Other Flowering Plants
Drummond's Rock Cress	Boechera stricta	Flowering Plants	Other Flowering Plants
Forest Blue Grass	Poa sylvestris	Flowering Plants	Grasses
Hill's Pondweed	Potamogeton hillii	Flowering Plants	Other Flowering Plants
Reflexed Sedge	Carex retroflexa	Flowering Plants	Sedges
Rock Whitlow Grass	Draba arabisans	Flowering Plants	Other Flowering Plants
Slender Marsh Blue Grass	Poa paludigena	Flowering Plants	Grasses

Open Space and Recreation Areas

As defined by the NYS DEC, open space is “land or water that is undeveloped (free from residential, commercial, industrial, or institutional use). Open space can be either private or publicly owned and includes areas such as forests, agricultural fields, public parks and preserves, and coastal lands. These spaces can be as small as a vacant lot or as large as the Adirondack and Catskill Forest Preserve.” NYS is very interested in designating and preserving open space, due to its many benefits to local economy, culture, environment, and our population's general well-being. Open space can provide scenic beauty, cultural value and historic significance, production of food and forest products, outdoor recreation, protection or restoration of ecological functions, wildlife diversity and habitat for endangered plant and animal species, fisheries, viewsheds, public access and ecotourism potential, mitigation of natural hazards, such as flooding, and protection of water supplies, values that can take decades or centuries to mature and can be quickly lost to new development.

The Village of Lansing has ~132 acres of designated open space, which takes up a little less than 5% of all Village area (Figure 9). The Village has developed a Greenway Plan to help manage and maintain the Village’s open space, parks and walking/biking paths. The Village of Lansing Greenway Plan is a guide for the development and use of a comprehensive network of parks, natural habitats, and recreation systems consisting of pathways, walkways, park land, and designated green or open space areas within the boundaries of the Village of Lansing.

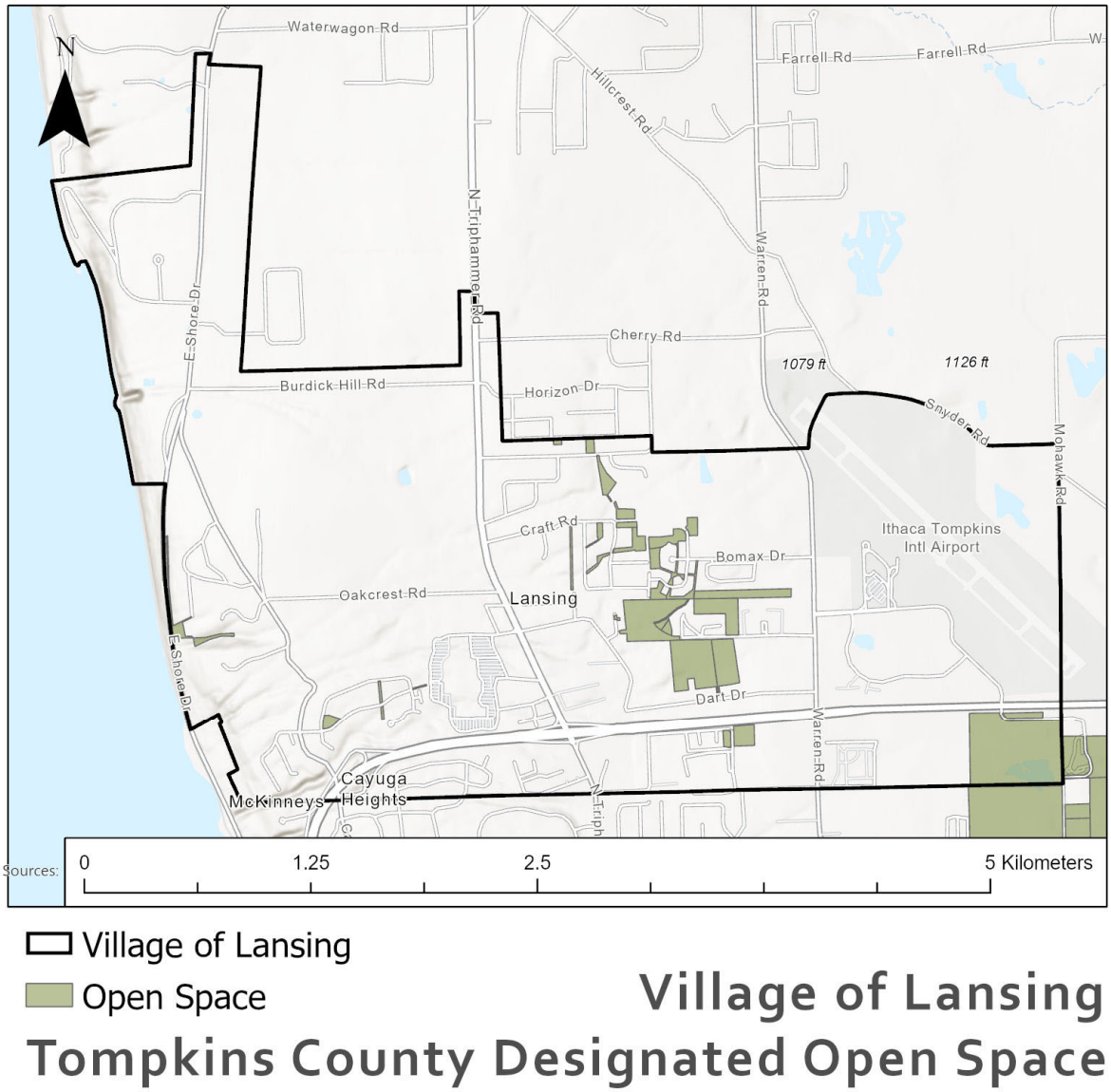


Figure 9: This map of the Village of Lansing's UNAs was created using data from Tompkins County. The Village has 34 parcels (~132 acres) of land designated as "Open Space." The largest parcel (~48 acres), a bird sanctuary named "Sapsucker Woods," is owned by Cornell University and located in the southeast corner of the Village.

Parks

The Village of Lansing has six parks within its boundaries. Parks are public areas of land used for recreational purposes. A park may be left in its natural state or may contain improvements for recreational purposes. Parks are important to communities, as they have economic value, health, and environmental benefits, as well as social importance.

Data from the National Recreation and Parks Association has shown that parks improve the local tax base and increase property values. Having access to places for physical activity, such as parks and trails, encourages community residents to participate in physical activity and to do so more often. Parks and protected public lands are shown to improve water quality, protect groundwater, prevent flooding, improve the quality of the air we breathe, provide vegetative buffers to development, produce habitat for wildlife, and provide a place for children and families to connect with nature and enjoy outdoors together. Parks reflect the quality of life in a community and can be social and community centers for many residents.

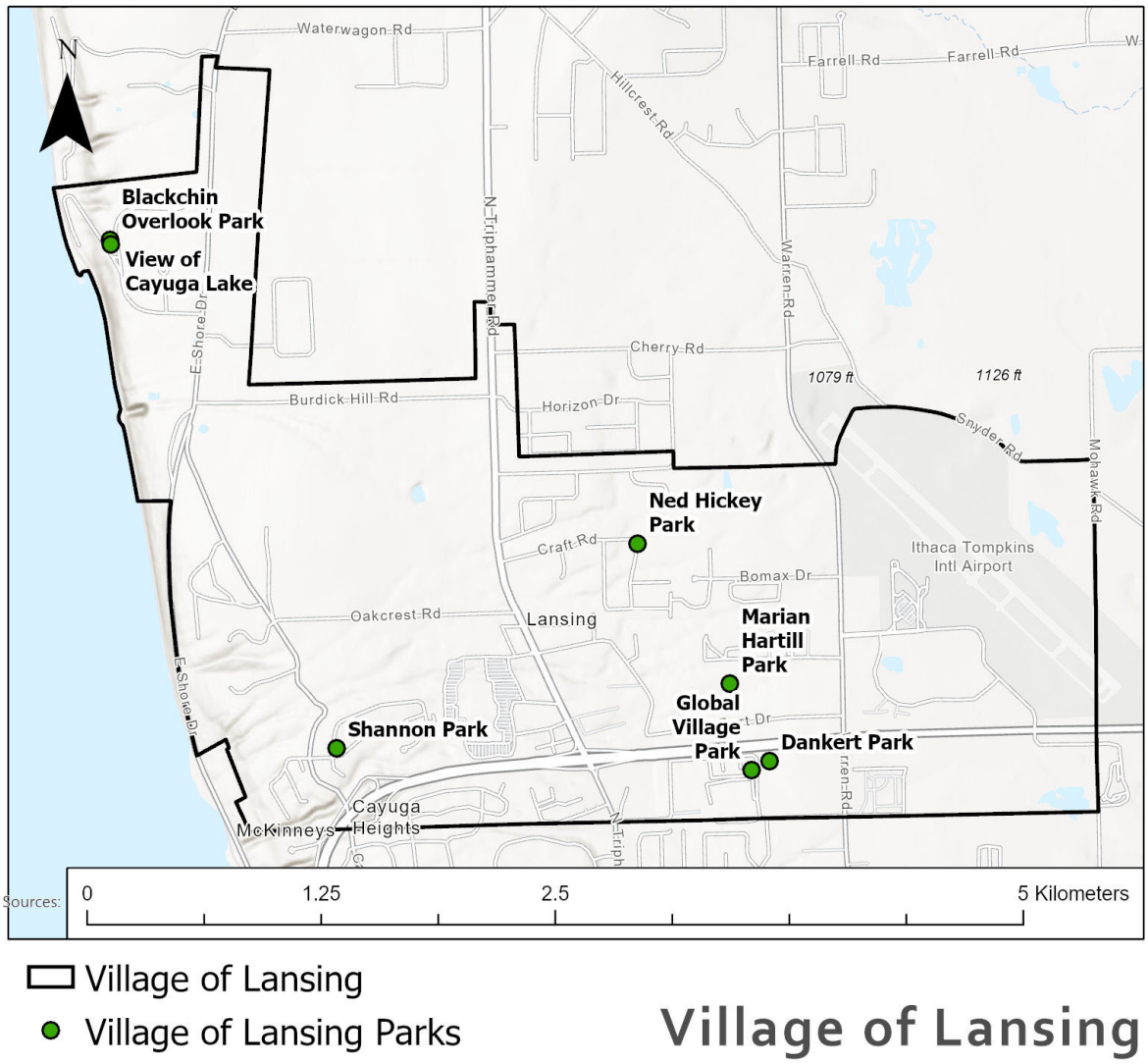


Figure 10: This map of the Village of Lansing's six parks was created using data from the Village of Lansing.

Walking Paths

In a well-designed community, homes, parks, stores, and schools are connected by safe walking and biking routes. Such routes allow all members of the community a chance to enjoy the outdoors and get physical and mental health benefits.

In the Village of Lansing, walkways and pathways are important because they connect residents and visitors to green spaces, to unique natural areas (like Sapsucker Woods), to

commercial centers (such as the Cornell Business and Technology Park and local businesses and malls), to public facilities (such as the Village Hall, the Post Office, and the Cayuga Medical Convenient Care Center), and to recreational facilities (such as the YMCA and Village parks). The walkways and pathways increase the walkability and cyclability of the Village, and they link neighborhoods, businesses, and public facilities into a shared community. They also promote alternative travel through the Village, reducing vehicle traffic and related traffic emissions.

In 2021, Village Local Law 3 (2021) Amendment of the Codification to Add a Section on Sidewalks and Walkways (Section 145-20.1) required any special action requested by a developer to the Planning Board be required to build sidewalks or walkways unless waived by the Planning Board. If a sidewalk or walkway is not feasible at the time of building, a Village controlled escrow account is to be funded by the developer for the addition of a sidewalk at a later date or in another part of the Village as deemed appropriate by Village officials.

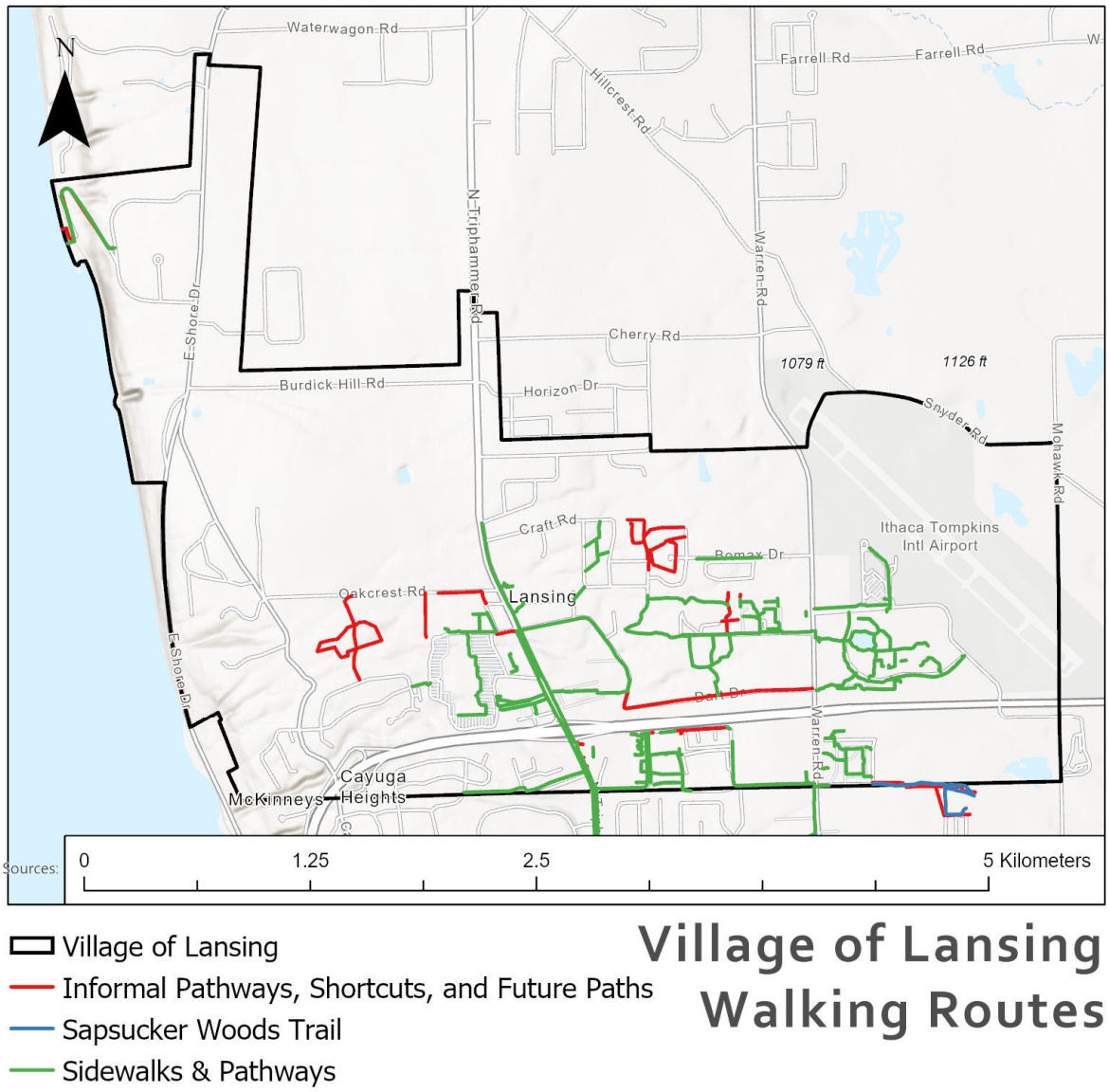


Figure 11: This map of the Village of Lansing's walking routes was created using data from the Village of Lansing.

Agricultural Resources

Agricultural Districts

Agricultural Districts provide the framework to limit unreasonable local regulation on farm practices, to limit public agencies' ability to acquire farmland by eminent domain, and to

limit the use of public funds to construct facilities that encourage development of farmland. Also, benefit assessments, special ad valorem levies, or other rates and fees for financing of improvements such as water, sewer or non-farm drainage may not be imposed upon land used in agricultural production and within a New York State Certified Agricultural District. The Village of Lansing has one parcel (0.49 acres) in the northwest that is within an agricultural district. However, there are more parcels located near the Village's borders (Figure 12).

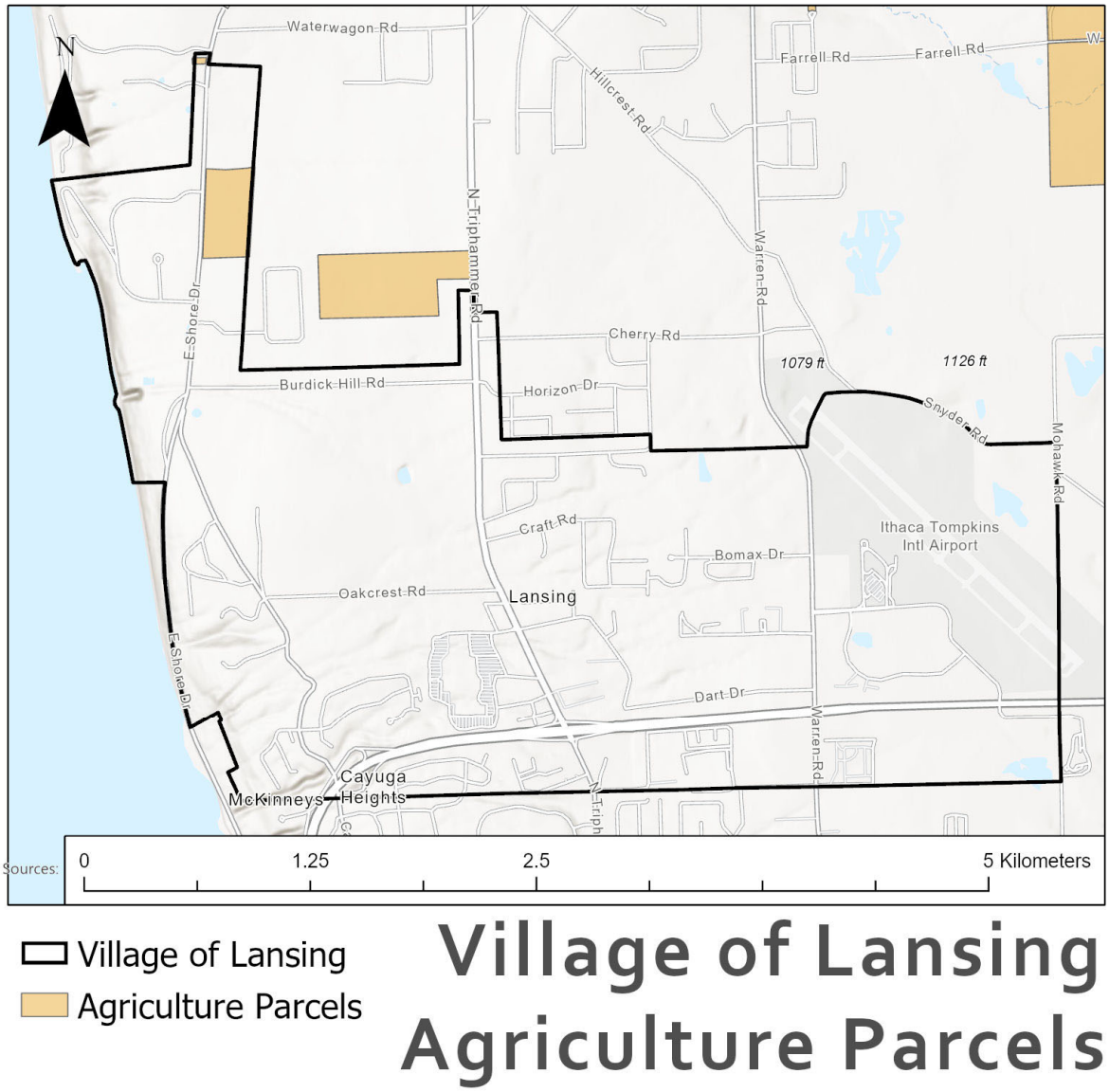


Figure 12: This map showing agriculture parcels was created using data from CUGIR, the Cornell University Geospatial Information Repository. These parcels are part of a New York State Certified Agricultural District.

Summary and Conclusions

The primary purpose of this NRI is to inform community members and municipal officials of the Village of Lansing's natural resources. Its secondary purpose is to provide building blocks for natural resource awareness in municipal planning such as the Village comprehensive plan, building and zoning regulations, proposed development plans, and in completing environmental assessments. The NRI describes local natural resources, including geology and soils, surface water, ground water, habitats and wildlife, open space and recreation areas, and agricultural resources.

Major Takeaways

Protecting environmental quality is a matter of choices and tradeoffs. Uninformed decisions might degrade the Village's natural resources, including wildlife displacement, loss of recreation corridors and scenic vistas, surface and groundwater contamination, increased pervasiveness of invasive species, and increased erosion and flooding. Development can be irreversible, which makes good planning very important. Long-term, NRI-consulted planning can help to minimize the short-term exploitation of a resource base resulting from "quick fixes". Decisions on development, infrastructure (new building and maintenance), and other land management issues will benefit from consulting the Village's NRI to provide a rational system for guiding land management and development with respect to the distribution and value of natural resources.

Looming climate change also threatens local natural resources. Climate encompasses fundamental meteorological characteristics defining our local environment. Long-term trends in seasonal weather patterns affect the species composition of natural landscapes, waterways, and agricultural practices. Climate can also dictate business and recreational opportunities. Since the mid-20th century, the planet's average temperature has risen as warming increases unevenly across the world. Additionally, drought and rainfall patterns are changing at an unprecedented pace. These climatic changes have been largely attributed to the burning of

fossil fuels (e.g., coal, oil, and natural gas) and other human activities that have increased the level of carbon dioxide and other heat-trapping greenhouse gases in the atmosphere.

To avoid facing the worst of these climate change projections, this NRI can guide Village municipal officials to address climate change through mitigation and adaptation. Mitigation refers to the reduction of greenhouse gas emissions, while adaptation refers to changing our practices to match new or inevitable climate conditions. Examples of NRI-based mitigation strategies include switching to renewable energy sources such as solar or hydro power; reforestation to sustainably capture carbon dioxide emissions; and offering transportation alternatives to driving, such as taking the bus, walking, biking, or carpooling. Examples of NRI-based adaptation strategies include relocating (or developing) facilities away from areas prone to flooding, creating cooling centers to shelter people on extremely hot days, and reducing water use during droughts.

Future Action Plans

To protect and preserve the Village's natural resources, the Village staff and municipal officials should read the Natural Resources Inventory and plan to consult the NRI when planning for Village facilities, green spaces, and infrastructure projects, and when planning future commercial or residential development within the Village. Additionally, the Village should make the NRI available to Village residents and potential developers to help plan future Village developments with a goal to protect and preserve natural resources.

It is recommended that the NRI be reviewed every 3 years and the inventory's information and goals be revised if necessary.

Resources and References

Cayuga Lake Watershed Intermunicipal Organization, https://cwio.org/.

Cayuga Lake Watershed Network, http://www.cayugalake.org/.

Cornell University Geospatial Information Repository (CUGIR), https://cugir.library.cornell.edu/.

Fakundiny, R. H., & Albanese, J. R. (2005). New York State Geological Survey (NYSGS). In P. Eisenstadt & L. E. Moss (Eds.), The Encyclopedia of New York State. Syracuse, NY: Syracuse University Press.

National Aeronautics and Space Administration (NASA), What Are Climate and Climate Change https://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-is-climate-change-58.html.

New York State Department of Environmental Conservation

Climate Change, http://www.dec.ny.gov/energy/44992.html.

Critical Environmental Areas, https://www.dec.ny.gov/permits/6184.html.

Freshwater Delineation Manual, https://www.dec.ny.gov/docs/wildlife_pdf/fwdelman.pdf.

Freshwater Wetlands Mapping, http://www.dec.ny.gov/lands/5124.html.

Freshwater Wetlands Permits, http://www.dec.ny.gov/permits/6058.html.

Freshwater Wetlands Program, http://www.dec.ny.gov/lands/4937.html.

Observed and Projected Climate Change in New York State: An Overview (2021). https://www.dec.ny.gov/docs/administration_pdf/ccnys2021.pdf.

Rare Animals, Plants, and Communities (2014), https://www.dec.ny.gov/natureexplorer/app/location/town/results.6.

New York State GIS Clearinghouse, http://gis.ny.gov/.

National Association of Wetland Managers: https://www.nawm.org/. .

U.S. Army Corps of Engineers

Buffalo District, http://www.lrb.usace.army.mil/.

Regulatory Program and Permits, http://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/.

U.S. Department of Agriculture

U.S. Department of Agriculture National Engineering Handbook Par 630 Chapter 7: https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba.

USDA Web Soil Survey: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

U.S. Department of Agriculture, Natural Resources Conservation Service

Ithaca Service Center, https://offices.sc.egov.usda.gov/locator/app?service=action/1/ServiceCenterSummary/4/agencyToOfficeLink.

Wetlands Reserve Program, https://www.nrcs.usda.gov/programs-initiatives/wre-wetland-reserve-easements.

Wetlands, https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/water/wetlands/.

U.S. Department of Agriculture, Natural Resources Conservation Service, Hydrologic Unit Boundaries, https://www.usgs.gov/national-hydrography/watershed-boundary-dataset

U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Division.

Hydric Soils – Introduction, https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/soil/hydric-soils.

Official Soil Series Descriptions (OSDs),

https://www.nrcs.usda.gov/resources/data-and-reports/official-soil-series-descriptions-osd.

U.S. Department of Agriculture, Soil Conservation Service, & Cornell University Agricultural Experiment Station. (1965). Soil Survey: Tompkins County, New York (1961 No. 25). Washington, D.C.: U.S. Government Printing Office.

U.S. Environmental Protection Agency

Healthy Watersheds Protection, https://www.epa.gov/hwp.

Surf Your Watershed, https://cfpub.epa.gov/surf/locate/index.cfm.

U.S. Environmental Protection Agency, "Streams," https://archive.epa.gov/water/archive/web/html/streams.html.

U.S. Fish and Wildlife Service, National Wetlands Inventory, https://www.fws.gov/wetlands/data/State-Downloads.html.

U.S. General Soils Map, https://gdg.sc.egov.usda.gov/GDGOrder.aspx?order=QuickState.

U.S. Geological Survey

National Geologic Map Database, https://ngmdb.usgs.gov/Geolex/search.

New York Water Science Center, Ithaca Program Office, https://ny.water.usgs.gov/about/officeithaca.html.

U.S. Supreme Court (2023), "Sackett et ux. v. Environmental Protection Agency et al." https://www.supremecourt.gov/opinions/22pdf/21-454_4g15.pdf

Tompkins County Natural Resources Inventory (2001), https://tompkinscountyny.gov/files2/planning/nri/inventory.pdf.

Tompkins County Unique Natural Areas Inventory, https://tompkinscountyny.gov/files2/planning/nri/eco_resources.pdf.

Village of Lansing Comprehensive Plan (2015): http://www.vlansing.org/Reports/2015_Comprehensive_Plan.pdf

Village of Lansing Code, Section 145 – Zoning: https://www.vlansing.org/Village_Code/Part_II/Chapter145Zoning.pdf.

Von Englen, O.D. (1961). *The Finger Lakes Region: Its Origin and Nature*. Ithaca, NY: Cornell University Press.

Winter, T.C., J.W. Harvey, O.L. Franke and W.M. Malley (1998). *Ground Water and Surface Water: A Single Resource.* USGS Circular.