

## Natural Resources - Introduction

Natural resources are the raw materials that make up the earth. Air, sunlight, water, land, animals, plants, and minerals are examples of these resources. Landforms are features of the landscape such as valleys, plains, hills, ridges, shorelines, and water bodies. Together, natural resources and landforms have a direct impact on community character and how a community develops. Historically, people settled in areas close to water with adequate land for farming and trees for construction and a source of heat. Clayton grew around the access to the St. Lawrence River and Depauville developed due to the power generated by the Chaumont River. This chapter looks at the

existing natural resources such as wetlands, major watersheds, soils, topography, and wildlife.

When looking at potential development the community must examine the potential physical impediments to development. A high water table or shallow depth to bedrock can make building in these areas difficult but they would be adequate for agricultural purposes. The topics discussed here are for general planning purposes. Specific development sites should be researched and reviewed for their own natural resource and landform issues.

## Regional Setting - Physical Characteristics

Clayton is located in the North Country region of New York State and the Thousand Islands in Jefferson County. Clayton lies within the St. Lawrence River Valley in close proximity to Lake Ontario, the Tug Hill and the Adirondacks. It is

### Natural Resources Goals:

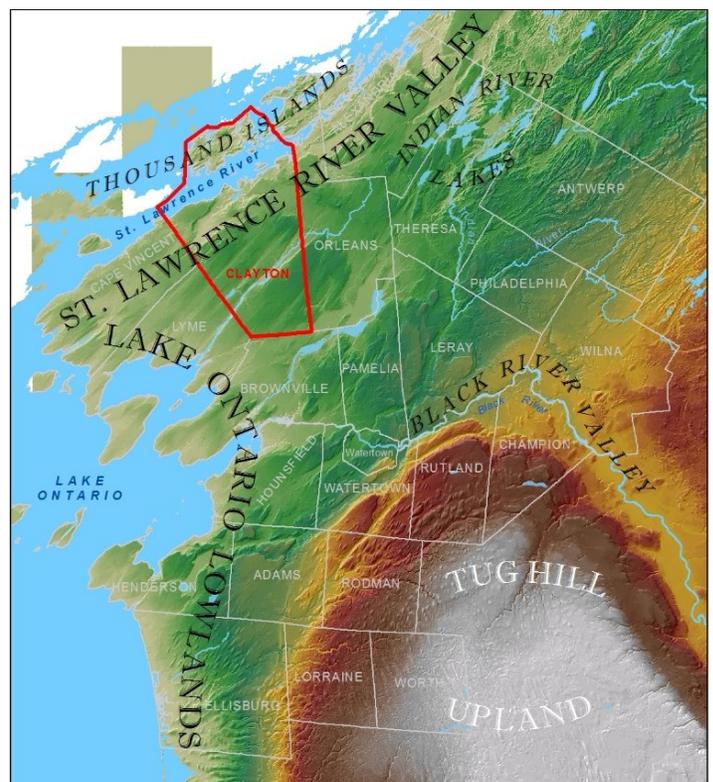
1. *Preserve and enhance open space, farmland, natural beauty, and critical environmental areas that provide scenic quality, help define rural character, waterfront community character, and recreational opportunities.*
2. *Encourage green infrastructure to preserve water quality, air quality, and increase community resiliency to storm events.*

### Natural Resource Objectives:

1. Designate scenic protection zones in appropriate areas.
2. Define character areas to enable priorities to be addressed by implementation steps.
3. Encourage green infrastructure at the site and neighborhood level.
4. Promote infill development by preserving, upgrading and reusing existing properties.
5. Protect important wildlife habitat, as well as threatened, endangered, and species of concern.

### Natural Resource Strategies:

1. **Designate priority farmland and critical environmental areas.**
2. **Consider green infrastructure needs within areas sensitive to flooding.**
3. **Examine open space and farmland protection needs in appropriate areas.**



MAJOR LANDFORM REGIONS  
Jefferson County, New York

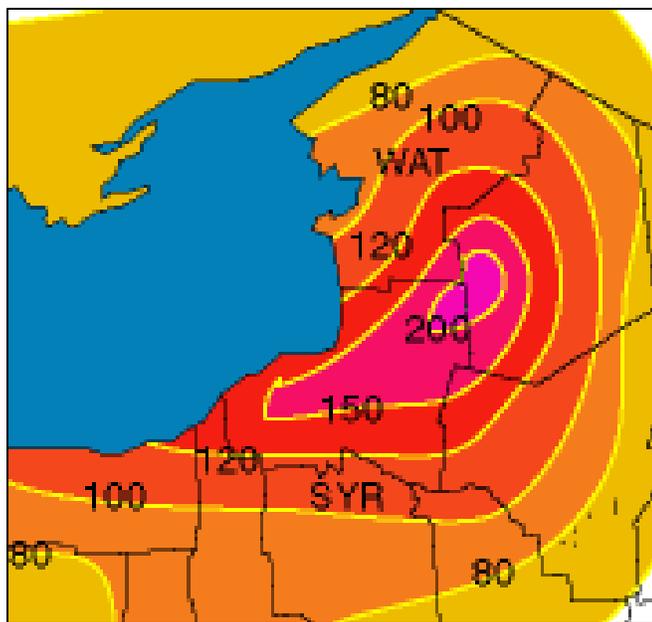


Created by M.H. Bunney in November 2003  
Source: Jefferson County Real Property Services, NY State DEC, US Geological Survey, ESRI, NYS CSD/C

bordered on the north by the St. Lawrence River and Canada, on the east by the Town of Orleans, on the south by the Town of Brownville and the west by the Towns of Cape Vincent and Lyme. The Town consists of 82.4 square miles and the Village is 1.6 sq. mi.. The Hamlet of Depauville is situated in the southern third of the town. The town consists predominantly of agricultural and forested areas with open skies and scattered residential and small commercial parcels. The waterfronts on the St. Lawrence and Chaumont Rivers are being developed residentially.

The main water body is the St. Lawrence River which is five to seven miles wide from the Canadian mainland to the American mainland in the Township. The Chaumont River originates in the Town of Orleans and flows through Clayton and Depauville to Lake Ontario at the Village of Chaumont. There are several smaller streams or creeks and a Lucky Star Lake.

There are many islands within the Town. Grindstone is approximately 5.5 miles long, 2.5 miles wide and over 5,600 acres. Grindstone is home to approximately 18 year-round residents, (2010 Census), while it had 251 residences. Other islands over 100 acres include: Picton, Murray, and Round. There are 53 named islands and 46 unnamed islands



North Country average snowfall within region

according to the Jefferson County Real Property data. They range from 0.03 to 5,671 acres with a cumulative total of 6,474 acres.

A majority of Clayton is made up of gentle rolling hills with less than 1% of the Town area having slopes in excess of 15%. The French Creek Wildlife Management Area is NYS owned, DEC regulated and consists of 2,265 acres of preserved land abutting the French Creek. Within this area are 600 acres of wetlands starting from just above the French Creek Marina and extending to the St. Lawrence Corners Rd (County Road 9).

### Climate

The climate for Jefferson County is characterized as humid-continental. The winters are long and relatively cold; the spring is cool and short; summers are warm and moderate; and autumn is also warm but usually short. The climate is influenced by the proximity to Lake Ontario, particularly during the winter. The relatively warm lake water provides moisture for air masses moving across from the west which then often results in “lake effect” snowfalls primarily in the southern portion of the County but may also impact Clayton. The average yearly rainfall for Jefferson County is 38.2 inches which is above the national average of 36.5. Also the average yearly snowfall for the County is 93.1 inches which is almost 300% above the national average of 25 inches. The County is below the national average for sunny days, 161 days compared to 205 days. January has an average low temperature of 9 degrees and July has an average high of 80 degrees.

### Wetlands

Wetlands are shallow water areas commonly referred to as swamps, marshes, bogs, wet meadows, or potholes. These shallow areas are essential aquatic ecosystems that support many types of vegetation, mammals, reptiles, waterfowl, fish, and rare plants. Typically, wetlands are very productive, contributing greatly to biological

diversity. Wetlands are very dynamic in nature and can be vulnerable to human encroachment and damage.

Wetlands also provide flood and storm water control by absorbing and storing rain and snow melt waters, thus minimizing flood damage. They also act as surface and groundwater recharge areas and help maintain important water resources. Wetlands buffer shorelines from erosion and help cleanse waters of pollutants through natural filtration and other processes. The Town of Clayton has approximately 10,728 acres of NYS DEC designated wetlands and 3,961 acres federally designated.

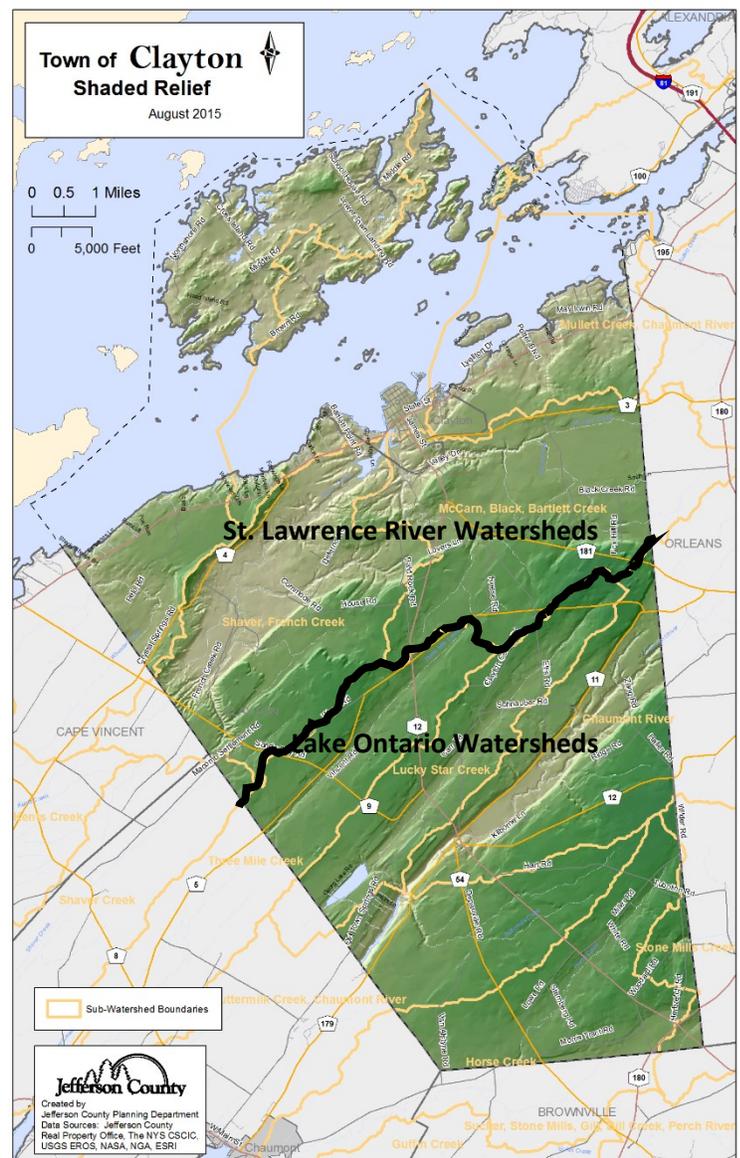
Wetlands also are valuable as a habitat for fish, waterfowl, and other wildlife. They are among the most productive ecosystems, providing a forage base for all levels of the food chain including spawning fish, nesting birds and many rare and endangered species. Another value of wetlands is that they provide natural beauty and open space that can often be utilized for education and recreation.

Threats to wetlands include encroachment by residential land use, over utilization and disruption of nursery and fish spawning areas by powerboats, and possible eutrophication and siltation. The area surrounding the French Creek causeway, where French Creek flows into French Creek Bay, is an important aquatic ecosystem that was significantly disturbed by the construction of the causeway which restricted natural water flow, significantly altering the ecology of French Creek. The removal of the natural marsh grasses has caused an increase in siltation that has rendered the creek barely navigable by personal watercraft, and changed the natural vegetation. Replacing the causeway with a bridge would help to restore this important ecosystem by restoring natural flows and sediment movement.

## Clayton's Watersheds

The northern half of Clayton is located within the St. Lawrence River watershed. According to NYS DEC its water quality is affected by atmospheric deposition of pollutants that originate largely outside the basin. Acid rain and mercury deposition are the most widespread issues in the watershed which affect fish consumption. Impacts from agricultural activities and associated runoff are also frequently cited in this very rural and agriculturally intensive area.

Runoff from the southern half of Clayton flows directly into Lake Ontario through the Chaumont River. Water quality concerns in the watershed



relate to invasive species and other aquatic plant growth which discourage recreational uses.

### Topography and Geology

In general, the topography within the Town and Village is generally level, with some undulation. As evidenced on the Shaded Relief map, there are some noticeable ridges that help define the area, including ridgelines on the north and south sides of French Creek, along the mainland shoreline west of the Village, along the north edge of McCarn Hill, and generally along both sides of the Chaumont River.

### Surficial Geology

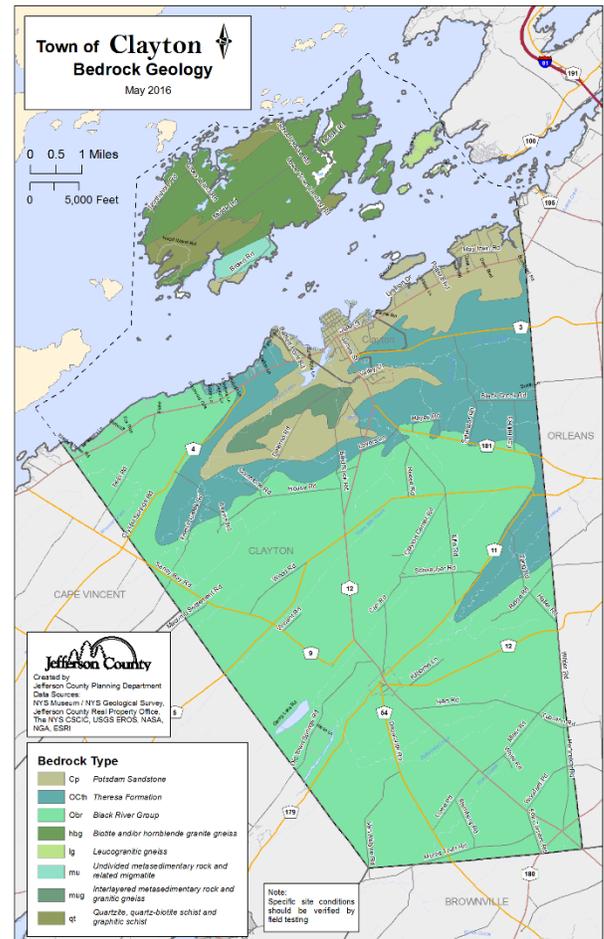
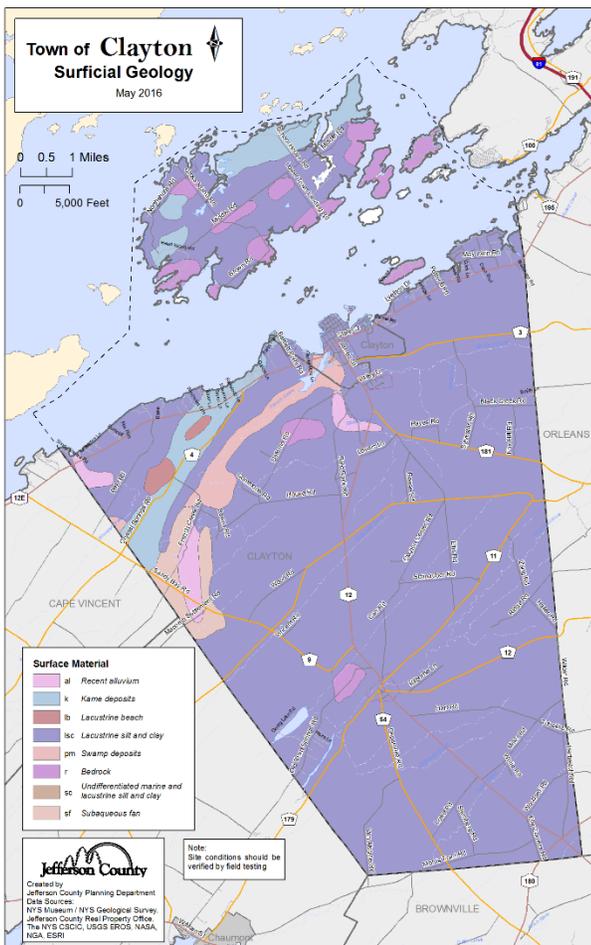
Surficial geology concerns the loose sedimentary materials that overlay bedrock and which are found near the earth’s surface. A large portion of the Town consists of lacustrine silt and clay, as does more than half the village. However, there are a few areas with

some Kame deposits, swamp deposits, and subaqueous fan. Swamp deposits also exist along the French Creek area with some recent alluvium as well. The two lacustrine beach deposit areas have served the Town as sand and gravel sources for years.

Some of the other surficial rock formations are sedimentary rocks. The sandstone and dolomitic sandstone are of the Cambrian Age while the limestone is of the Ordovician Age. Other areas, such as Grindstone Island, consist of some quartzite and schists along with larger areas of biotite and/or hornblende granite gneiss.

### Bedrock Geology

Bedrock geology refers to the physical rock visible underneath the soil, river systems, till, etc. The geological character of the north and northeasterly



area of the Town consists of sandstone bedrock known as Potsdam Sandstone. The absence of other sedimentary rock in it reflects a broad transition from the more predominant and recently deposited limestone (Black River Group) from the northwest to the southern portions of the Town, and the older gneisses and granites located in the north and northeasterly areas within the Town.

The Black River Group outcrops periodically and contains mainly limestone rocks separated into two formations, the Lowville and the Chaumont. The Lowville Formation is a medium-light to light gray, generally thinly bedded, micritic limestone. The Chaumont Formation overlies the Lowville Formation and contains more massively bedded limestone and basal chert.

### Aquifer recharge/groundwater

Karst is a kind of landscape, and an aquifer type. Karst areas consist of solid but chemically soluble rock such as limestone (most important) and dolomite, but also gypsum, anhydrite and several other soluble rocks. This type of aquifer is vulnerable to contamination due to their hydrogeological properties. Contaminants can easily enter karst aquifers through thin soils or via shallow holes (sinks). Once, inside the aquifer, contaminants can quickly spread over large distances, due to rapid flow in the conduit network. Natural attenuation processes such as filtration and retardation are often less effective than in other aquifers.

The Limestone/karst aquifer covers a large portion of the Town (Black River Group) and is not mapped, therefore the areas of flow, depths to groundwater, and flow rates may not be quantified at this time.

### Soil Groups

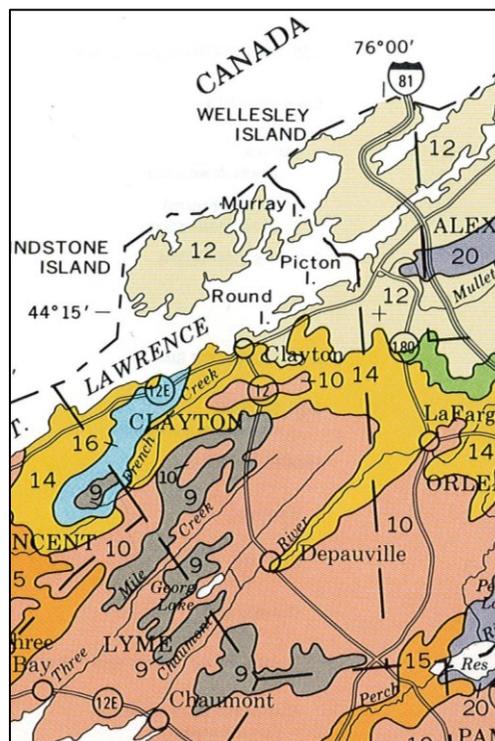
According to the Soil Survey of Jefferson County, NY, Soil Conservation Service and Cornell University, 1988, the Town and Village consist of 5 soil groups.

#### Soil Group Name

10. Chaumont - Galoo - Wilpoint - Guffin, 50% of the Town. Moderately deep to very shallow, excessively drained to very poorly drained, clay or loamy on lowland plains.
12. Rhinebeck - Hudson - Rock outcrop, 15% of the Town. Very deep, somewhat poorly drained and moderately well drained, clay soils and Rock outcrop, on lowland plains.
14. Vergennes - Kingsbury - Elmridge, 15% of the Town. Very deep, moderately well drained and somewhat poorly drained, loamy soils over clay sediments, on lowland plains.
16. Groton - Windsor - Alton, 10% of the Town. Very deep, excessively drained to well drained, loamy or sandy soils, on ridges, terraces and plains.
9. Benson - Newstead - Galoo - Rock outcrop, 10% of the Town. Moderately deep to very shallow, excessively drained to poorly drained,

loamy soils and rock outcrop on lowland plains and uplands.

Four general types of soil are distributed throughout the Village waterfront. Silt loams are deep, fine textured, well-drained soil and are found on the eastern end of the peninsula. Silty clay loams are moderately deep and poorly drained, and are located on the western and northern portions of the Village peninsula. Under the drainage ways of French Creek and Bartlett Creek sit



saprists and aquents consisting of mixed organics and mineral materials. Highly altered soils from filling operations can be found at the western end of Mary Street.

The thin soils of the Town's waterfront are represented by five general categories. These categories include: Benson-Newstead-Galloo Outcrop, Chaumont-Gallo-Wilpoint-Guffin clayey loam, Rhinebeck Hudson Rock Outcrop, Vergennes-Kingsbury-Elmridge loams and clays, and Groton-Windsor-Alton sands. Although loams are identified within these soil categories, they represent only a small portion in land area. The soil categories are predominantly composed of silty clays that drain poorly and are susceptible to ponding.

### Septic System Suitability

Soils in Clayton, generally described above, continue to influence development levels throughout the Town and Village. Certain soils or soil conditions present have limitations for buildings and private septic system placement.

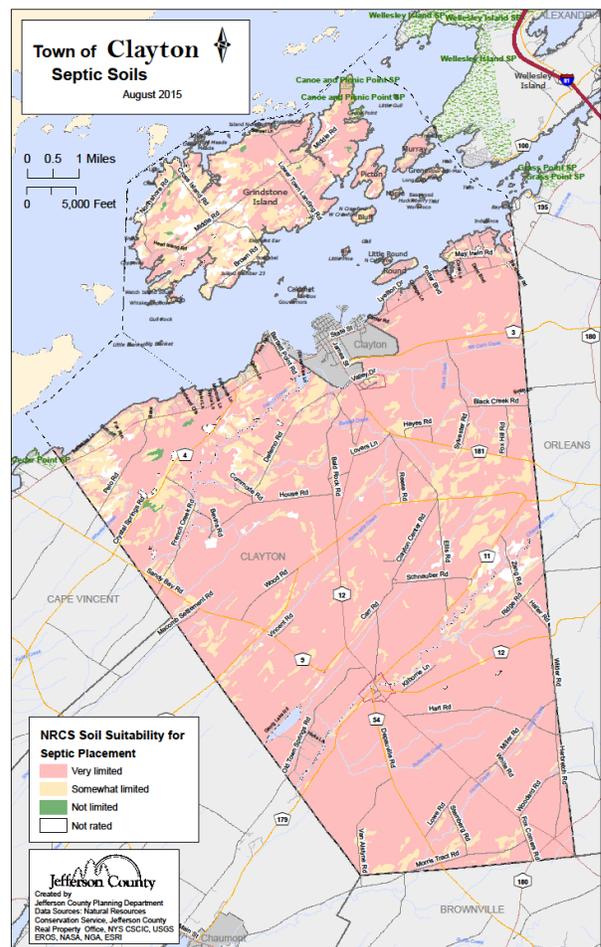
Soils in the County have been classified according to their ability to support on-site septic systems by the Soil Survey. Such septic systems consist of septic tank absorption fields in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. The following ratings are based on soil properties, site features, and observed performance of the soils. Permeability, high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan also interfere with installation of individual septic systems.

Suitability is considered '*not limited*' if soil properties and site features are very favorable

for the indicated use. Good performance and very low maintenance can be expected.

Suitability is considered '*somewhat limited*' if soil properties and site features are moderately favorable for the indicated use. The limitations can be overcome by special planning, design or installation. Fair performance and moderate maintenance can be expected.

Suitability is considered '*very limited*' if soil properties or site features have one or more features that are unfavorable for the specific use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.



Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent.

On-site tests or investigations must be performed to be certain whether the present soils or soil conditions will support an individual septic system on a given site or project area. Initially refer to the Septic Soils Map as a guide.

### St. Lawrence River

The St. Lawrence River is one of the most significant waterways in North America. Extending 760 miles from Lake Ontario to the Gulf of St. Lawrence, the River is the gateway between the Atlantic Ocean and the Great Lakes. At its most downstream point in the US, it drains an area of 300,000 square miles. The upper St. Lawrence can be divided into three sections: the Thousand Islands section, the middle corridor section, and Lake St. Lawrence. The Thousand Islands section (northwestern Jefferson County and southwestern St. Lawrence County) includes a complex of islands, numerous shoals, and channels.

Despite the heavy use that has occurred over time, including international commercial transport, hydroelectric power generation, and industrial and residential development, the river continues to support a diverse array of fish and wildlife. Passage of the Lake Ontario St.

Lawrence River Plan 2014 should improve habitat for most species, as it is a more environmentally appropriate water levels plan.

### Chaumont River Revitalization

The Chaumont River Corridor has been the subject of a recent Waterfront Revitalization Strategy study completed in January of 2015. The Strategy identifies a series of area specific recommended projects to enhance the River, as well as Chaumont Bay to increase public access and use throughout the area. The effort could be considered a precursor to a potential Local Waterfront Revitalization Program but LWRP funding has not yet been secured.

### Flood Plains

Most floodplains are found in low areas adjacent to streams, rivers, lakes and ocean and are prone to periodic flooding. In undeveloped areas, this natural interaction restores soil fertility, recharges groundwater supplies creating unique and diverse habitats.

The Federal Emergency Management Agency (FEMA) has designated 100-year flood zones. This designation does not mean that flooding will occur only once a century. Instead, it means that in any given year, there is a one-in-one hundred chance of flooding. Frequency of flooding is dependent on many factors, including weather conditions and upstream development changes to the watershed.

Flooding is not considered a significant problem within Clayton's waterfront area. In the Village, the 100 year floodplain generally consists of a narrow band of 10-100 feet wide around the edge of the village peninsula. In the Town, the 100-year floodplain mostly surrounds creeks and bays. Specifically, areas within the 100-year floodplain on the mainland include low areas at French Creek and Wheeler Creek. On Grindstone Island, areas within

the 100-year-floodplain include low areas adjacent to Delaney Bay, Rusho Bay, Aunt Jane's Bay, and Flynn Bay.

The Town of Clayton and the Village of Clayton are in compliance with the terms of the National Flood Insurance program as administered by FEMA. Both the Town and Village of Clayton have adopted floodplain regulations to control the location and siting of new construction activities within flood zone areas in an effort to minimize damage to property, life, and natural resources.

### River Area and Town Species

The 700 + mile long St. Lawrence River is home to many fish species and can be divided into four hydrographic zones. The Town and Village of Clayton are part of the Fluvial Section, which runs from Lake Ontario past Montreal to Trois Rivières. The river life can be divided into seven categories: plants, plankton, benthic organisms, fish, amphibians, birds and mammals.

**Plants** - Thousands of species of plants inhabit the water and shorelines of the St. Lawrence River system. In the Fluvial Section many are found in wetlands, such as marshes, wet meadows and swamps. Plants provide an important food source for other species and create habitats for many organisms.

**Plankton** - Plankton are tiny creatures that drift in the water with limited ability to propel themselves. They form the base of the food chain in the St. Lawrence River and include bacteria, yeast, phytoplankton and zooplankton. Like plants, the phytoplankton has a role of fixing carbon dioxide via photosynthesis. Zooplankton, on the other hand, is the animal-form of plankton, such as the larvae of fishes that drift along the length of the river.

**Benthic Organisms** - Benthic organisms dwell on the river bottom and are important for recycling organic matter, particularly in deep areas where sunlight does not penetrate. They are also a food source for

other species, as well as people. Some bottom dwellers found in the Fluvial Section include mollusks (e.g., clams), crustaceans (e.g., crabs), oligochaeta worms, diptera larvae, amphipods, gastropods (e.g., snails) and tubificids.

**Fish** - Freshwater fish species found in the Fluvial Section include bullhead, carp, large and smallmouth bass, pumpkinseed, walleye, stickleback, sturgeon, pike, burbot, sucker, perch, shiner, trout, mud-minnow, char, muskellunge, and redhorse.

**Amphibians and reptiles** - Amphibians and reptiles are important secondary consumers in the food chain, eating, for example, insects or plankton. A range of amphibians can be found in and along the river including salamanders, newts, mudpuppies, turtles and frogs.

**Mammals** - Other than bats, most of the area's mammal population can be found in the marshes and wetlands. Examples include mink, muskrats, otters, beavers and raccoons.

**Bats** - Bats are also mammals, and New York is home to nine bat species. Six of the nine bats are cave bats while the other three are tree bats. Indiana Bat, Little Brown Bat, Northern Bat, Eastern Pipistrelle Bat, Big Brown Bat, and Small-footed Bat use caves during winter hibernation, while the Red Bat, Hoary Bat, and Silver-haired bat live year round in trees.

**Birds** - Most birds along the St. Lawrence inhabit the wetlands in the Fluvial Section, as well as the estuaries closer to the Gulf. Many migrate to the river ecosystem during the spring in search of food and breeding grounds. The main birds in the Fluvial Section include blue heron, Canada geese, mallard, merganser, goldeneye, snow geese, moorhen, wood duck, green heron, pied billed geese and peregrine falcon, bald eagle, and golden eagle. Less common species include redhead and yellowtail.

## Wildlife Species and Plants at Risk

Species at risk currently occupying waterfront and other area habitat, include, but are not limited to: the **Bald Eagle** (NYS Threatened); **Northern Harrier** and **Common Tern** (NYS Threatened); **Common Loon** (NYS Species of Special Concern); **Lake Sturgeon** (NYS Threatened); and **Muskellunge** (status unrated, but of significant concern at local and state levels). Other species that frequent areas within the Town include the **Short Eared Owl** (NYS Endangered; Osprey (NYS Species of Special Concern); the **Indiana Bat** (Federal and NYS Endangered), and the **Northern long-eared bat** (Federal and NYS Threatened). An at risk plant species is Small **Skullcap** (a flowering plant rated as especially vulnerable, with 5 or fewer recorded occurrences in New York State). The location and presence of these species are described:

### **Bald Eagles** - (NYS Threatened)

Bald Eagles are present in the waterfront area as spring and fall migrants and winter residents. As winter residents, they occupy open water pools in the ice cover and forested shoreline areas. Seasonally persistent open water pool habitat occurs in the vicinity of Woronoco and Basswood Islands. Bald Eagles also frequent the Perch River Wildlife Management Area adjacent to the southern portion of the Town according to NYS DEC.

### **Northern Harriers** - (NYS Threatened)

Northern Harriers are present in migration, as nesting residents and as winter residents. They occupy wetlands, shorelands, shrublands and fields.

### **Black Tern** – (NYS Endangered)

Black Terns migrate back to the area in early May breeding on inland marsh complexes (such as Perch River Wildlife Management Area), ponds, mouths of rivers, and shores of large lakes.

### **Common Terns** - (NYS Threatened)

Common Terns are present as migrants and as colonially nesting residents. They occupy open water, shoreline and wetlands such as French Creek Marsh.

### **Common Loons** (NYS Species of Special Concern)

Common Loons may be present in breeding season, as well as in migration. They occupy open water, shoals, shoreline, and wetland edge habitats.

### **Lake Sturgeon** - (NYS Threatened)

Lake sturgeons are known to inhabit waters of the waterfront area. Critical habitat locations have not been identified – perhaps due to a lack of data.

### **Muskellunge** – (significant concern NYS)

Muskellunge spawning/nursery habitats (occupied) have been identified in several waterfront embayment areas (Steve LaPan to SLEOC: 9/28/89), including Blind Bay and two unnamed bays between McRae and Delaney Bays on Grindstone Island.

**Short Eared Owl** – (NYS Endangered) Northern populations are believed to be highly migratory, and there is a marked increase in the number of birds in New York in the fall and spring. Short-eared Owls are more common as winter residents in New York State. As breeders they are very rare, being largely limited to the St. Lawrence and Lake Champlain Valleys, the Great Lakes plains and the marshes of Long Island's south shore. Probable locations have been noted in the approximate vicinity of Clayton according to DEC.

**Osprey** – (NYS Species of Special Concern) In New York, there are two main Osprey breeding populations, one on Long Island and the other in and near the Adirondack Mountains. However, nests have been established throughout Jefferson and St. Lawrence County near waterbodies. Within its range, the osprey prefers to make its home along the coastline, and on lakes and rivers. Osprey also frequent the Perch River Wildlife Management Area adjacent to the southern portion of the Town according to NYS DEC.

**Upland Sandpiper** (NYS Threatened) In the northeastern United States populations are declining due to loss of grassland habitat. Historically the upland sandpiper was reported as a locally common

breeder in parts of New York. Today the state population is restricted to remaining grassland habitats of the St. Lawrence Valley in Jefferson County, and the Mohawk Valley.

**Blandings Turtle (NYS Threatened)** Jefferson and St. Lawrence counties (between US Route 11 and the St. Lawrence River) are among the few places in New York State home to threatened Blanding's turtles.

**Indiana Bat - (Federal and NYS Endangered)** Indiana Bats have established winter hibernacula and summer ranges within central Jefferson County.

**Northern Long-eared Bat – (Federal and NYS Threatened)** Northern Long-eared Bats are known by NYS DEC to summer in the Town of Clayton and winter in Brownville and Watertown.

**Small-footed Bat – (NYS Species of Special Concern)** Small footed Bats are all known to have hibernacula and maternity colonies in Jefferson County according to Integrated Environmental Data, LLC.

**Small Skullcap – (NYS vulnerable)** The Small Skullcap plant has been identified as present on three small islands and one mainland site within the waterfront area.

## Scenic Resources

The Thousand Islands region is recognized as one of the greatest landscapes and impressive scenic vistas in the United States. Its open skies and protruding islands and mainland outcroppings, abundant natural vegetation and wildlife habitats, and historically and culturally significant boathouses and other structures are all a part of the characteristics associated with the scenic quality of the Clayton Community and Thousand Islands region.

Impressive scenic views within the Town include views to the St. Lawrence River from roadways and upland areas, views from shoreline locations and from the water, and views from various locations of open space and agricultural resources. The highway

gateways and corridors along NYS Routes 12 and 12E are very important to the visual quality and image of the Town's traditional rural character. Additionally, Routes 12 and 12E through Clayton are part of the Great Lakes Seaway Trail, a national scenic byway along the St. Lawrence River, Lake Ontario, the Niagara River, and Lake Erie. Important scenic views from the river to a mostly natural shoreline are present along the western, northern and eastern shores of Grindstone Island and from the channel looking towards the Village. Smaller islands, such as Picton and Bluff, contribute equally significant vistas and add to the overall aesthetic quality of the Thousand Islands region.

Efforts to protect and maintain some of the most important scenic views on Grindstone and Murray Islands are presently being undertaken by organizations such as the Thousand Islands Land Trust (TILT), the Trust for Public Lands, Clayton Town Planning Board, and private individuals. These organizations and individuals have taken positive steps to limit development, protect scenic vistas and wetlands, and create a forest preserve through fee acquisition and conservation easements.

In the Village, shoreline properties along Riverside Drive afford exciting views of an expanse of the St. Lawrence River with islands, seaway traffic, fishing and boating activities characteristic of the Thousand Islands region. Views of the St. Lawrence River on axis with other village streets, such as James Street are also significant. Additionally, the views from the Mary Street docks, the 1,000 Islands Harbor Hotel and those from and in the vicinity of the Route 12E Bridge at French Creek warrant protection and enhancement.

## Save The River

Save The River is a non-profit community-based environmental organization with the mission to restore, preserve and protect the ecological integrity of the Upper St. Lawrence River through advocacy, education and research. Operating in both Canada and the U.S., their office is in Clayton, and serves to further its members' and followers' vision for the St. Lawrence as a healthy river that provides safe drinking water, is home to a thriving range of indigenous species and supports sustainable economic activity. Their mission and vision is premised on a simple core value that the River is a commons [commonly shared for all] to be nurtured and passed on undiminished for future generations to share.

Since 1978 Save The River has campaigned to stop the introduction of aquatic invasive species through the dumping of ballast water of ocean-going ships, advocated for an environmentally appropriate water levels plan, and organized water quality restoration and monitoring programs to track River health and identify pollution problems. Save The River's educational programs, which provide place-based experiences that connect area kindergarten to 12th grade students to the St. Lawrence, reach over 1,000 students each year. Every summer its Riverkeeper Volunteer trainings give adults and children the tools they need to identify and report potential issues on the River. Save The River is a member of the international Waterkeeper Alliance as the Upper St. Lawrence Riverkeeper and champions a swimmable, fishable, drinkable St. Lawrence River.

Save The River hosts two annual events for fund raising and hosts a Winter Environmental Conference, bringing together researchers, opinion leaders, elected officials and seasonal and year-round residents to hear about issues of concern to

the River community.

## Significant Fish and Wildlife Habitats

The Town and Village of Clayton Local Waterfront Revitalization Program (LWRP) describes the significant coastal habitats. A brief summary of each is included within the Plan, as well as the inland habitats, to ensure the sites will be incorporated during future priority planning and regulatory processes.

### Eel Bay

Eel Bay is located on the upper St. Lawrence River, on the west side of Wellesley Island in the towns of Clayton and Orleans. One of the most extensive shallow bay areas in the St. Lawrence River, this fish and wildlife habitat consists of an approximately 2,100 acre shallow bay, containing extensive beds of submergent marsh vegetation, and several small islands including Big Gull and Little Gull Islands. The habitat extends southwest to the shores of Murray Isle and Picton Island. There are two sizeable emergent wetland areas, totaling about 75 acres, around the bay shoreline. Eel Bay is somewhat sheltered from prevailing winds and wave action, by being situated in the lee of Grindstone Island.

Eel Bay is one of about five major waterfowl concentration areas in the St. Lawrence River. The bay provides excellent food resources for a variety of migratory bird species, especially diving ducks, such as scaup, canvasback, common goldeneye, redheads, and mergansers. Concentrations of several thousand birds have been observed in the area during spring (March-April) and fall (September – November, primarily) migrations in some years. Considerable numbers of other waterbirds,

including loons, grebes, herons, and shorebirds also occur in the area during periods of open water (especially during migration). Bald Eagles have been observed using perches on various islands in the bay for hunting and roosting during the winter, although the extensive use is not well documented. Common loons have bred regularly in the bay since at least the 1950's, and active nests are located on islands in the bay. This is one of the only confirmed breeding locations for this species on the St. Lawrence River. Big Gull Island continues to have marginal common tern colonies, while various species of gulls and terns, including common tern (T), and black tern (SC), feed in the area during ice-out periods.

Eel Bay provides suitable habitat for various warmwater resident fish species, including large and smallmouth bass, yellow perch, brown bullhead, and panfish such as rock bass and pumpkinseed. Other fish documented in the area include the rare pugnose shiner (E), and the blackchin shiner (SC). Eel Bay is an especially important concentration area for young and adult northern pike, supporting the best year-round recreational fishery for this species in the St. Lawrence River. Anglers from throughout New York State and beyond are attracted to this area.

### **French Creek Marsh**

French Creek is one of about four very large, undeveloped, streamside wetland ecosystems along the St. Lawrence River. This extensive area of undisturbed habitat has a high degree of interspersed wetland vegetation, open water, and uplands, creating favorable conditions for many fish and wildlife species. French Creek Marsh is a very productive nesting

area for waterfowl and other marsh birds, including pied-billed grebe, green heron, American bittern, least bittern (SC), Canada goose, mallard, American black duck, blue winged teal, wood duck, northern harrier (T), Virginia rail, sora, common snipe, belted kingfisher, eastern kingbird, red-winged blackbird, yellow warbler, and swamp sparrow.

French Creek Marsh has also been documented as an important feeding area for common terns (T) nesting at nearby islands and navigation cells in the St. Lawrence River. Locally significant concentrations of waterfowl use the area for feeding and resting during spring and fall migrations. Other wildlife species inhabiting the area include raccoon, mink, beaver, muskrat, northern leopard frog, northern water snake, snapping turtle, painted turtle, and Blanding's turtle (T). Extensive beds of submergent and emergent aquatic vegetation in French Creek Marsh serve as valuable fish spawning and nursery habitats. The area is used extensively for spawning by a variety of warmwater fish species. French Creek is considered one of the most productive fisheries habitats along the St. Lawrence River, especially for northern pike, brown bullhead, largemouth bass, white sucker, and a variety of panfish, such as pumpkinseed, rock bass, and black crappie.

Access to the marsh for passive recreation use is available from several points in the Wildlife Management Area, and from commercial access sites in the Village of Clayton.

### **Grindstone Island Wetlands and Bays**

Grindstone Island is the second largest island in New York's portion of the upper St. Lawrence River, located approximately one and a half

miles northwest of the Village of Clayton, in the Town of Clayton. The fish and wildlife habitat consists of four large coastal wetland and bay areas on the island. These are: Flynn Bay (270 acres), which includes adjacent Lindley Bay, located at the southern end of Grindstone Island; McCrae Bay (325 acres), which includes adjacent New Bay, located at the northwestern part of the island; Delaney Bay (200 acres), located in the northeastern part of the island; and the littoral shoreline which extends from Canoe Point south to Point Angiers (200 acres), located along the eastern part of the island.

Grindstone Island wetlands encompass some of the largest undeveloped bays and wetlands in the St. Lawrence River. These areas comprise an extensive riverine natural area complex that is rare in the Great Lakes Plain ecological region of New York. The Grindstone Island wetlands provide valuable habitats for a variety of fish and wildlife species. The bay areas are known to be very productive nesting areas for waterfowl and other marsh birds, including green heron, American bittern, mallard, gadwall, northern harrier (T), Virginia rail, sora, common gallinule, spotted sandpiper, belted kingfisher, marsh wren, common yellowthroat, red-winged blackbird, and swamp sparrow. Other species which regularly feed in these areas during the breeding season include black-crowned night heron, great blue heron, and common tern (T), but the extent of use by these species is not well documented. Concentrations of waterfowl (especially dabbling ducks) also use the bays for feeding and resting during spring and fall migrations (March-April, and September – November, primarily). At least several hundred ducks have been observed in these areas for years. Other wildlife species occurring in

Grindstone Island bays include muskrat, mudpuppy, many common species of frogs and turtles, and northern water snake. The area also serves as a major reproductive habitat for fish populations in the upper St. Lawrence River. The bay and wetlands are productive fish spawning and nursery areas, supporting sizeable populations of many warmwater species, such as northern pike, brown bullhead, largemouth bass, and various minnows and shiners. In addition to the wetland fish spawning and nursery values, the littoral shoals are significant for muskellunge reproduction. These bays, along with the other St. Lawrence River shoreline bays, comprise the majority of all documented muskellunge spawning areas in the St. Lawrence River.

The adult muskellunge population provides some of the basis of a sports fishery which attracts anglers from throughout the northeastern US. Recreational fisheries for pike, bullhead, and bass in the major bays on Grindstone Island attract additional anglers from throughout NY and PA.

### **St. Lawrence River Shoreline Bays**

The St. Lawrence River shoreline bays are located on the upper St. Lawrence River, between the Villages of Cape Vincent and Alexandria Bay, in the Towns of Cape Vincent, Clayton, Orleans, and Alexandria, Jefferson County. The fish and wildlife habitat consists of eight shallow bays along the River's mainland shoreline. The bays are: Peos Bay (20 acres), Millens Bay (35 acres), Rose Bay (30 acres), Carrier Bay (160 acres), Grass Point Bay (190 acres), Cobb Shoal Bay also known as Moore Landing Marsh (40 acres), Swan Bay (140 acres), and Point Vivian Marsh (75 acres). The latter

four form an almost continuous three and a half mile reach of productive littoral zone and wetland habitat.

Much of the land area surrounding the bays has been developed into seasonal camps, permanent residences, and small craft harbor facilities (resulting in some habitat disturbance). Grass Point State Park and Collins Landing Wildlife Management Area owned by the Thousand Islands Bridge Authority (TIBA) are exceptions to the predominance of private land ownership. These two public areas provide direct access for public use of the resources associated with the habitat.

These extensive shallow riverine habitats have been subject to human disturbance, but they continue to be important fish spawning and nursery areas in the St. Lawrence River. All of the bays support productive populations of various warmwater species, including northern pike, brown bullhead, largemouth bass, and various forage fish species.

Of special significance however, is the use of these areas by muskellunge. Studies conducted in the past revealed that all eight bays serve as spawning and nursery areas for muskellunge. Muskellunge populations in the St. Lawrence River, which comprise a distinct subspecies from muskellunge populations found elsewhere in New York State, appear to be largely dependent on the habitat found within the St. Lawrence River shoreline bays. This area, in combination with Grindstone Island Bays, comprise the majority of known muskellunge spawning and nursery habitat in the St. Lawrence River. The recreational fishery for this species and others attract anglers from throughout New York State, as well as from adjoining states and provinces.

### **Thousand Islands Tern Colonies**

The Thousand Islands tern colonies are located along the St. Lawrence Seaway navigation channel, extending from the Town of Clayton to the Town of Alexandria in Jefferson County. The fish and wildlife habitat consists of one man-made structure supporting navigation lights, located where shoals occur in close proximity to the Seaway channel, and three small rocky islands and one small group of islands. The specific sites include a small group of islands known as the Eagle Wing Group, located approximately one-half mile northwest of the Village of Clayton; Gull Island, located about one mile north of Carrier Bay; Tidd Island, located one mile north of Mason Point; Light Northeast 216, located approximately one-half mile south of Thousand Island Park; and an island known as Southeast Isle of Pines, located just north of Fishers Landing in the Town of Orleans.

A critical feature of the Thousand Island tern colonies is their isolation from mammalian predators and human disturbance. However, predation by great horned owls appears to be a serious and long standing problem for the island colonies. Ringed-billed gulls also nest on the islands and compete for suitable nesting sites. Thousand Islands Land Trust uses volunteers to place wire grids over the small islands allowing use by nesting terns, but excluding gulls.

### **Perch River Wildlife Management Area**

According to the New York State Dept. of Environmental Conservation the Perch River Wildlife Management Area (WMA) is a 7,862 acre parcel dominated by its high quality wetland and open water habitats, but also offers woodland, early succession, and grassland

habitats. The area is well known for its waterfowl and furbearer game species. It is a site for waterfowl concentration, diverse species concentration, individual species concentration, species at risk, and bird research. The site supports **American bittern** (SC), **least bittern** (T), **osprey** (SC), **bald eagle** (T), 50-60 breeding pairs of **black terns** (E), **sedge wren** (T), and **Henslow's sparrow** (T). Many other characteristic wetland species breed here including **pied-billed grebe** (T), **trumpeter swan**, **Virginia rail**, **sora**, **common moorhen**, **American coot**, **marsh wren**, and **swamp sparrow**. Open water serves as foraging area for **Caspian tern**, **common tern**, **black tern**, **pied-billed grebe**, **osprey**, **bald eagle**, and many other species.

The Perch River Wildlife Management Area consists of high quality wetlands and open water bordered by deciduous forest, shrubland, and open agricultural fields. Exemplary ecological communities include: deep emergent marsh, shallow emergent marsh, shrub swamp, and forested wetlands.

### Chaumont Barrens Preserve

Chaumont Barrens is another very rare landscape straddling the Towns of Clayton and Lyme. It is a unique alvar landscape owned by the Nature Conservancy. North American alvar sites are characterized by a mosaic of austere, windswept vegetation, and occur in an arc along north western Jefferson County, through Ontario, to northern Michigan. Alvar communities are supported by a rare combination of extreme conditions: shallow soil, flooding, and drought, which provide habitat for a unique mixture of plants, including many that are rare in New York State. The landscape at the Barrens includes exposed outcrops, deep

fissures, and rubble moss gardens as well as patches of woods, shrub savannas, and open grasslands serving as important habitat to a number of bird species.

Chaumont Barrens is a significant attraction in the Town and County. Historically, the area is publicized quite well in Nature Conservancy literature, and many groups and individuals take advantage of the marked trail accessible from the Morris Tract Road (formerly County Route 125). The parking area is on Van Alstyne Road just after a small cemetery. The preserve is open daylight hours from early May until early fall. Opening and closing dates depend on the annual flooding cycle. For your safety and protection of the fragile soils and rare plants, follow times of closure indicated on the parking lot sign. Chaumont Preserve has a self-guided, 1.7-mile trail that is uneven in spots requiring hardened footwear.

### Alvar – Rare Community Ecology

The alvar ecosystem and associated natural communities are comprised of species that can exist on shallow soils over level outcrops of calcareous bedrock, such as limestone or dolomite. This ecosystem is characterized by widely varying moisture regimes and soil depths with many areas of rocky outcrop pavement barrens. The variable, often extreme, temperature and moisture conditions found throughout the system result in unusual assemblages of plants. These plant communities contain uncommon mosses, lichens, sedges, flowering herbs, ferns, grasses, and some trees more common to arctic, alpine and native grassland prairie-like environments. Typical species include Creeping Sedge (NYS

Threatened), Prairie-smoke (NYS Threatened), Purple Rock-ress (NYS Threatened), and Crawe's Sedge (NYS Threatened). These communities exist above a karst system with underground and surface water flow. Any large scale disruption of local hydrological conditions could prove extremely destructive to these significant natural sites.

Coniferous Alvar woodlands can provide a dense cover, with conifers such as White Spruce, White Cedar and White Pine. Deciduous woodlands are more open with limited understory, giving them a park-like appearance. Though trees in the Alvar often appear small or stunted, some trees have been found to be hundreds of years old. This is reflective of the harsh environment faced by plants in the Alvar, due to substantial seasonal and annual variations in available moisture and the intense temperatures and drought conditions, often found at ground level during mid-summer. These communities test plant survival in such extremes. The end result is a fairly specialized vegetation array. This array includes several natural grasslands that in part appear to be maintained by surface water flow during spring melt that persists into the growing season. These grasslands are the rarest of the Alvar natural communities and obviously their disruption would be catastrophic.

Invertebrates, including insects, found in the Alvar are also unusual for the region and are well-adapted to the harsh conditions. This fauna has not been fully inventoried and their ecology is poorly understood. Many are more common to grasslands of the western plains, but occur locally in our Alvar. These include rare ground

beetles, sawflies and flightless leafhoppers. Over twenty species of ground snails thought to be new to science have been found on Alvar formations. The presence of such biodiversity of these life forms is a clear indicator of the natural value of these areas.

Alvar sites contain a breeding avifauna that has elements distinctly different from nearby non-Alvar sites. In particular, species such as Prairie Warbler and Eastern Whippoorwill are common breeders in the Alvar but rare or unknown in much of the rest of Jefferson County. Where Yellow Warbler and American Redstart are common breeders in nearby areas they are very uncommon in the Alvar. Instead Black and White and Nashville Warblers are the more common wood warbler species. Hermit Thrush breeds here but is rare elsewhere in low altitude regions. The Alvar breeding bird community is unusual in many ways given its proximity to Lake Ontario. The New York State endangered Loggerhead Shrike was once common as an Alvar breeder and conservation of these rare habitats offer significant restoration opportunities. The nature of the breeding bird community is simply another indicator of the ecological importance of this region.

It is unclear exactly why there is so little soil in the Alvar but theories include that most soil was scraped or washed away during a glacial event. In addition, this region was covered by Glacial Lake Iroquois for many centuries prior to the formation of modern Lake Ontario. Since the period after the last glaciation has been relatively brief, there has been insufficient time to develop substantial soil atop approximately

450 million years old bedrock. The bedrock formed the bottom of a shallow, tropical sea near the equator. Fossils of giant cephalopods, top predators of the ancient marine food chain, can be seen in many exposed sites in these rocks.

Alvar communities are globally rare, and US sites occur primarily in the watersheds of the Great Lakes. The area of Alvar found in Jefferson County is the only system of its type in New York State. The Lake Ontario Alvar is the southeastern most portion of a system stretching from Michigan's upper peninsula, through Ontario, Canada, into New York. Because it is so unique in character, and so limited in scope, Alvar is a critical priority for conservation. In Jefferson County intact Alvar occurs only in the towns of Clayton, Cape Vincent, Lyme and Brownville.

### Threats

Alvars are vulnerable to any disturbance that alters surface or ground water flow, disturbs established plants, causes wildfire or expands invasive plants. Once a fire starts in an alvar, it can travel underground for many miles and be nearly impossible to extinguish, harming unsuspecting wildlife and humans. Alvar birds are impacted by any activity that increases ambient noise levels or fragments the habitat.

Major threats to Alvar in our area include limestone mining, commercial wind/solar facilities, timber extraction, subdivisions, residential development, invasive species encroachment, and recreational vehicle traffic. As these areas become more popular as nature tourism destinations, excessive foot traffic could

also be a threat. The scientific understanding of these rare communities remains limited and they require protection from all human activities that could potentially cause large scale disruptions.

### St. Lawrence River Valley

The vast "agricultural grassland" of the St. Lawrence Valley supports some of the largest populations of grassland and other early successional bird species in North America (Pashley, et al., 2000). A much higher percentage of bird species that rely on grassland and shrubland/early successional forest are in long-term and widespread decline more so than any other landbird group. Many species that are declining elsewhere are breeding successfully and maintaining stable populations in the St. Lawrence Valley, including the bobolink, eastern meadowlark, short-Avian short-eared owl, upland sandpiper, Henslow's sparrow, savannah sparrow, grasshopper sparrow, sedge wren, and the northern harrier (USFWS, 2000). An estimated 17% of the world's bobolink population breeds in the St. Lawrence Valley. An abundance of savannah sparrows have been recorded here as well (Rosenberg, 2000). These birds, and many other wildlife species, rely upon the extensive grasslands of the St. Lawrence Valley. The most significant concentration of wintering raptors in New York State has been observed in the immediate region, including the northern harrier and the short-eared owl.

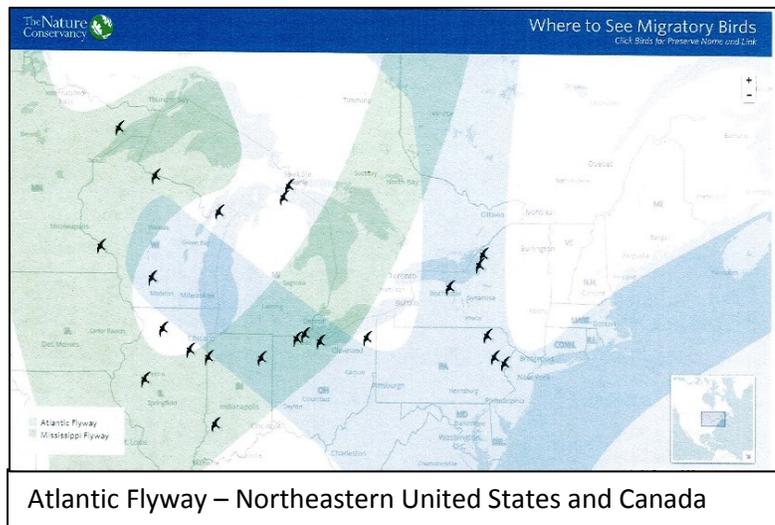
According to the [2014 Draft NYS Open Space Conservation Plan](#), (page 147) the area is a "A major New York State resource consisting of islands, sand dunes, bluffs, embayments, wetlands, major tributaries, lake plains, significant bat and avian migratory flyways, opportunities for shoreline and

island access and other significant natural and cultural resources. This system begins at the St. Lawrence River in Jefferson County” “The area also provides nesting, feeding and resting habitat for waterfowl. The lake plain and escarpment, especially where they are located relatively close to the lake, define important avian and bat migratory flyways, providing crucial resting and feeding areas during migratory periods, and critical airspace for migrating birds and bats. They also provide important and unique nesting and wintering habitats for critical avian species, including the American bald eagle, short-eared owl, northern harrier and other species of conservation concern.”

### Migration and Stopover Areas

It’s long been known that the Great Lakes basin, especially the Lake Ontario coastal areas including the St. Lawrence River Valley, support large populations of migrating birds during both spring and fall. Millions of waterfowl, shorebirds, water birds, songbirds, and raptors utilize the region’s diverse habitats on their journeys, including open waters, agricultural fields, mudflats, shrub lands, marshes, coastal wetlands, grasslands, and forests. These migration rest stops, also known as “stopover areas”, provide shelter and nourishment to hundreds of different bird species, helping to ensure the success of these migrations, which contribute to the region’s biodiversity, and support the local economy through recreational opportunities such as bird watching.

These birds rely on local coastal areas. For many if not all of them, it’s the unique combination of dependable winds created along the water/land boundary at the regional level, suitable rest stops, necessary reproductive conditions. Food



Atlantic Flyway – Northeastern United States and Canada

sources such as aquatic insects, plants, and fish are available at many stopover areas, allowing the hundreds of migratory species to keep coming back and/or through the area annually.

Such areas include French Creek Wildlife Management Area (WMA), Perch River WMA, Point Peninsula WMA, Ashland Flats WMA, Chaumont Barrens, and the hundreds of other farm fields, wetlands, and grasslands that encompass the area.

### Migration Times

Many species of birds migrate during the day. These diurnal migrants include shorebirds, various hawks, gulls, loons, ducks, geese, and songbirds. But the bulk of songbirds migrate at night. Nocturnal migrants such as warblers, vireos, thrushes, and sparrows leave their daytime habitats just after dusk and spend the next eight to ten hours flying. Near dawn they descend to another site along their migratory route, and spend the day or next few days feeding and resting until they can continue the journey. Each species employs its own strategy for migration, but all require two important things during this event – food and rest.

Clayton's myriad of habitats provide both of these necessities.

Diurnal migration depends heavily on riding rising air currents called thermals. As these air currents heat up during the day and rise in the atmosphere, birds take advantage of this lift. Many species thermal hop – rising to the top of one thermal, setting their wings for direction, coasting to the next thermal, and then repeat the process. Thermals do not occur at night in sufficient quantity to allow these birds to utilize them successfully. Other thermal riding or soaring birds include cranes and herons. Some songbird species, such as kingbirds, swallows, and blackbirds will migrate during the day however, the vast majority are nocturnal migrants.

Most birds (excluding owls, night-herons, goatsuckers, and some other species) are typically diurnal during most of the year, but they migrate only at night. Nocturnal migrants tend to be birds that have long distances to fly and do so in powered flight. At night the atmospheric structure is much more stable. It is cooler and smoother than during the day. The coolness helps birds to maintain healthy body temperatures without large water losses, while the smoothness of the air allows for a straight level course without expending energy correcting and maintaining a course in turbulent air. Also, the cover of night is a good way to avoid predation.

### Wintering Areas

Migrating birds find their way between their wintering and breeding grounds. However, a number of birds winter within the area: for example, bald eagles winter along the St.

Lawrence River. Their wintering area stretches from Kingston, Ontario and Cape Vincent, New York easterly through to Cornwall, Ontario and Massena, New York, depending upon ice cover. Typically, eagles can be seen at Wellesley Island State Park along the edge of the ice or roosting in trees along the shoreline. If ice forms over these areas, eagles have been known to move further east to the Brockville narrows or other open water.

### Bats

Three species of bats (Indiana Bat (Federal and State Endangered), Northern Long-eared Bat (Federal and NYS Threatened) and the Small-footed Bat (NYS Species of Special Concern)) are active in the warm months throughout the area. During the winter several species, including the federally endangered Indiana bat, hibernate in caves in the region. Several cave wintering bat species populations have been decimated by the introduced "white nose syndrome". It is essential that any anthropogenic disruptions of population recovery be prevented.

### Monarch Butterflies

Monarch butterflies in Eastern North America have a second home in the Sierra Madre Mountains of Mexico where they overwinter from October to late March (USDA – Forest Service).

They migrate/travel during the day and need to roost at night. They gather close together during the cool autumn evenings and typically the same roost sites are used year after year. Often pine, fir and cedar trees are chosen for roosting as these trees have thick canopies

that moderate the temperature and humidity at the roost site. As warm temperatures and longer days occur, the migratory generation of monarchs finishes the development they halted prior to their migration. This starts the northern journey back to North America. Unlike the generation before them, who made a one-generation journey south, successive generations make the journey north.

They use a combination of air currents and thermals to travel long distances. Some fly as far as 3,000 miles to reach their winter sites.

Because the migrating monarchs are concentrated in a few locations during the winter, they are especially vulnerable to harsh weather and to human activities that disrupt or destroy their habitat. This can reduce the number of monarchs that leave the overwintering sites in the spring. Similarly, migrating and breeding monarch populations are vulnerable to harsh weather and to human activities that reduce milkweed and nectar sources. This can reduce the number of monarchs that reach overwintering sites.