Management Strategies for The Woodlawn Preserve Schenectady, NY

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Introduction and Past Land Use Practices

The Woodlawn region is at the eastern edge of the city of Schenectady. The neighborhood is bounded roughly by Balltown Road, the Town of Rotterdam, Fehr Avenue, and the Schenectady Municipal Golf Course.

Originally the name was given to a large subdivision in the early 1900s along State Street and Consaul Road where the two roads intersected Central Park. The plan never materialized and the city through foreclosures by way of tax delinquencies replatted the area in the 1950s with much of it going to the development of the Municipal Golf Course, the Crosstown Arterial, and two schools in the 14th Ward. The rest was turned into housing.

The expansion into the 14th Ward in the early 20th century was characterized by small bungalows and cape houses. While most of the area in the southern portion was wetland, paper streets were plotted in the early 1920s but not developed. Others around the preserve area were developed as small capes, bungalows, foursquares, and ranches. A portion of the preserve along Gifford Road was allowed to be developed.

The Woodlawn Preserve is in an ecologically sensitive area known as the Pine Bush locally and part of the larger Hudson Valley Sand Plains, a belt of post glacial deltas and sandy areas left by the retreating glacier more than 10,000 years ago, and stretching from Glens Falls to Newburgh. The Woodlawn Preserve is actually the beginning section of the Albany-Schenectady Pine Barrens, formed on a large delta (the Mohawk Delta) and created by the dumping of sediment from the GlacioMohawk River into Glacial Lake Albany occupying the Hudson Valley up to 450 feet above sea level. As the lake drained, a series of dune forming periods developed and in the Schenectady region some of the largest dunes were built. The largest sand dune in the Pine Bush is located in the Schenectady Municipal Golf Course at over 400 feet.

The Woodlawn Preserve is primarily a large dune complex with interdune wetlands. The headwaters of the Lisha Kill flow through the region and a artificial canal was created to act as an outflow of the man made lake in the preserve draining into the Lisha Kill. The water from this headwater and two tributaries eventually finds its way to the Mohawk River.

Before the area was altered by humans, it was an intact dune complex with typical Pine Barrens flora on top and surrounding the complex with wetlands between the dunes. Typical Pine Bush species have been recorded and seen in the preserve area up to the late 1970s, in case of the endangered Karner Blue Butterfly, and, as seen in the accompanying natural history section of this report, many of the Pine Bush floral species still exist, though not in abundance.

While we know that the Pine Bush was inhabited prehistorically by local Native Americans, there has been no evidence uncovered as of yet from the Woodlawn Preserve area.

Human exploitation of the area did occur early. King's Road was originally a Native American trail that was widened about 1663 into a carriage road and became the main route between Fort Orange (Albany) and Schenectady until about 1800.

Figure 1. The King's Highway connected Albany to Schenectady until the arrival of toll roads in the late 18th century. Here the Woodlawn area can be seen near the beginning of the Swart Kill in the upper right.

Dotted along this highway were several taverns and was the focus of an archeology project during the 1970s by then Albany City Archeologist Don Rittner. The Albany Schenectady Turnpike, now Route 5 or State Street was built as a toll road in 1797. The construction of the

Mohawk and Hudson Railroad, New York State's first railroad in the early 1830s, took out much of the southern part of the dune complex. This routing and subsequent widening of that route in 1838 cut through the large dune complex that made up the core of the Woodlawn Preserve. You can see the remnants of this dune complex on both sides of the tracks on the 1925 Randall Map.

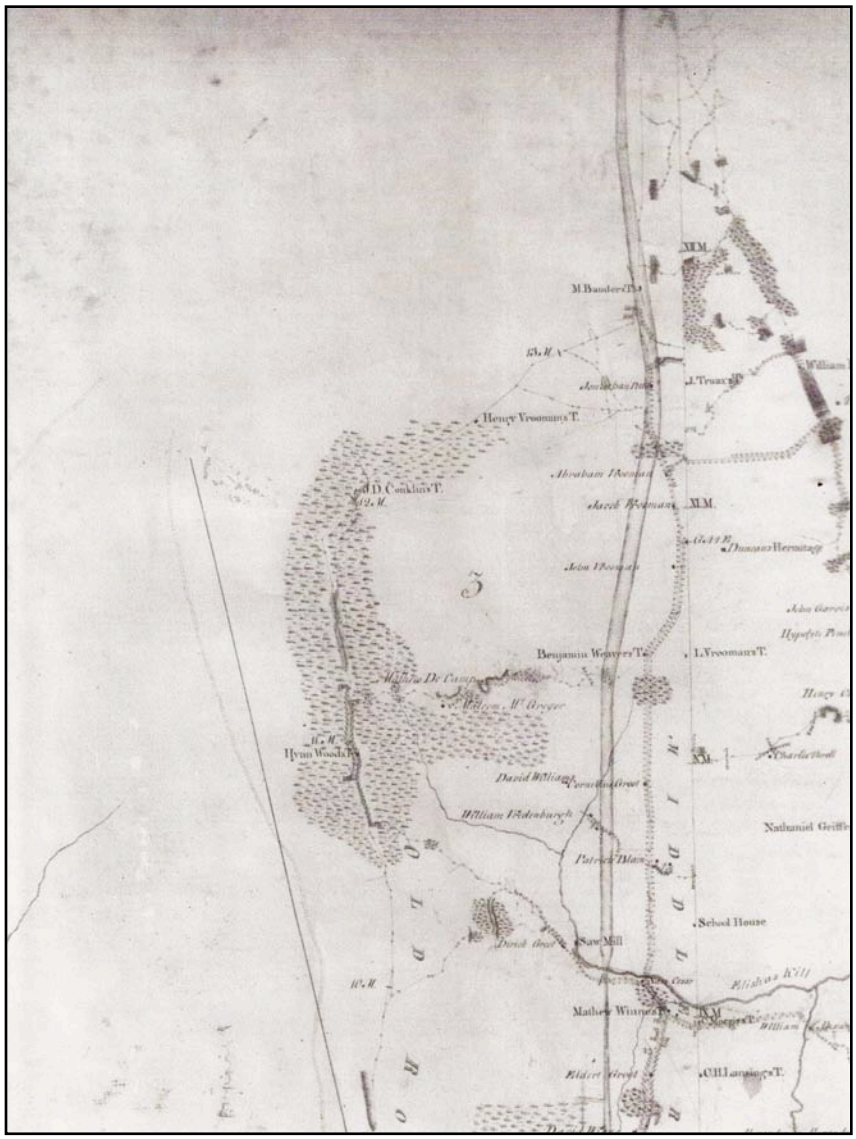


Figure 2. The John Randal Map of 1805 shows the newly constructed Albany Schenectady Turnpike and the old King's Highway forming the north and south borders of the Woodlawn area today (Area marked number 3 on map). The dark wide line down the right hand middle is a proposed canal. Several taverns are found along both the King's Highway and the turnpike.

Figure 3. 1925 Randal Map showing Woodlawn Preserve area, dune complex, and wetlands. Sand mining for railroad construction and subsequent mining has obliterated most of the dune complex except for the northern highest point. Both northern and southern ends (south of RR track) of the dune complex can be seen.

The current railroad tracks are still used and approval of a second rail will further change the makeup of this section.

Figure 4. Replica of the Mohawk and Hudson Dewitt Clinton and passenger cars. This is the first railroad in NYS and the original line is the same line that goes through the Woodlawn Preserve.

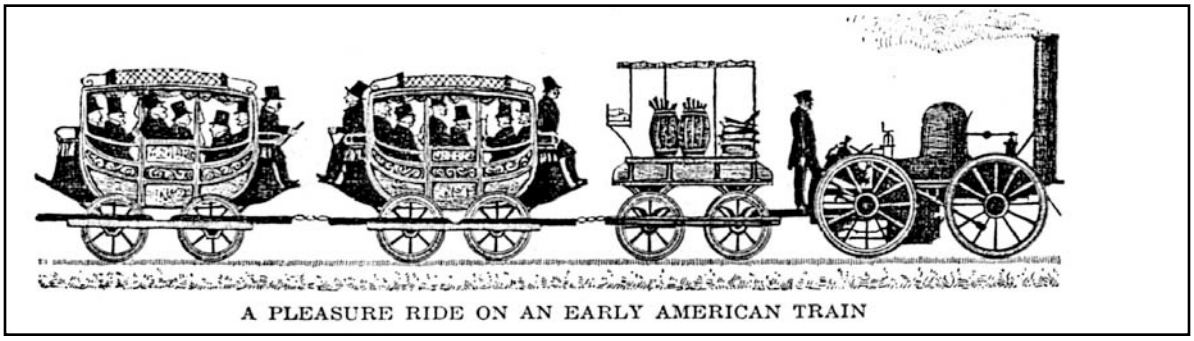


Figure 5. Profile of the Mohawk and Hudson Railroad engine and cars.

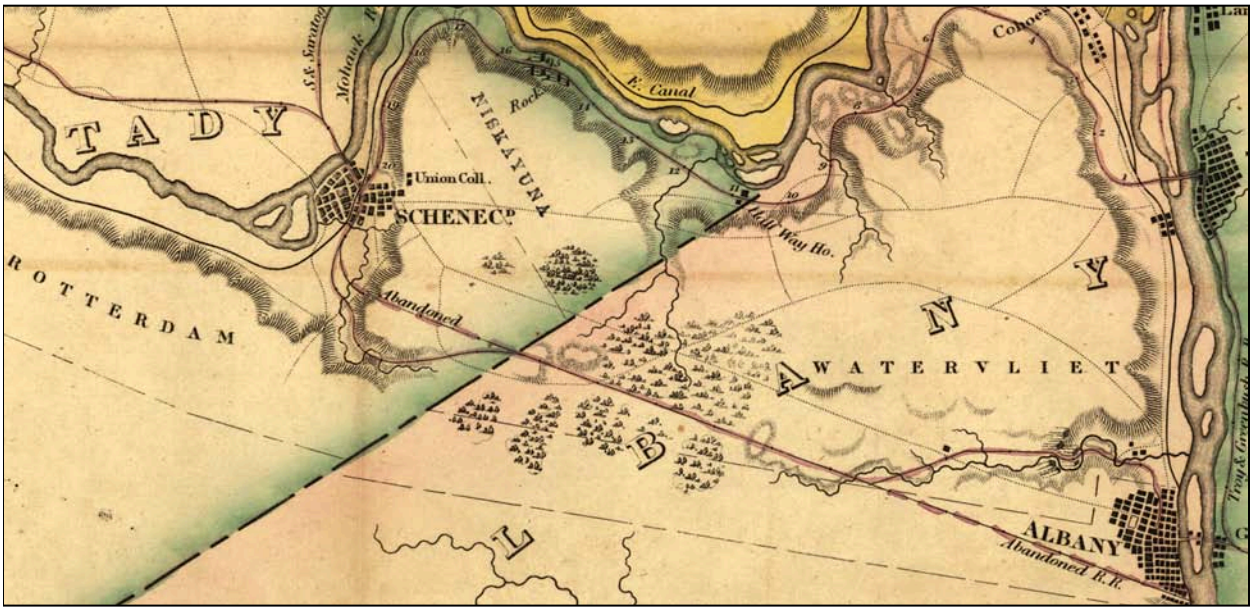


Figure 6. Map of 1845 which shows original and modified route of the Mohawk and Hudson (Albany & Schenectady) Railroad as it goes through the Woodlawn area. Two large dunes are shown in the approximate location of Woodlawn Preserve on the map.

It appears that little activity occurred in the area until housing developments were allowed in the 1950s, although sand mining continued. In 1969, the city council citing a "great shortage of vacant land" in Schenectady and the need to set aside land for "public purposes" declared a 145 acre section of undeveloped Pine Barrens as the Woodlawn Preserve.

Characteristic Pine Barrens flora and fauna covered much of the dune section of the preserve including the now endangered Karner Blue Butterfly that was last seen in the preserve by then Albany City Archeologist and President of the Pine Bush Historic Preservation Project, Don Rittner, in the early 1970s.

A study of the Woodlawn area in 1972-73 by C.T. Male Associates was attempted to find a solution to flooding in the area. During the 1970s through the 90s, the city spent over seven million dollars building holding ponds and storm sewers in the Woodlawn area due to poor drainage. This included enlarging the "retention" pond now considered a small lake in the preserve.

Much of this drainage problem had to do with the leveling of dune fields in the area by housing developments in the 1950s and sand mining earlier which brought the water table closer to the surface (or development closer to the water table) and in many cases surface land into the water table. It was also a recharge area for the Lisha Kill. One could argue that environmentally the area was not suited for development in the first place but environmental considerations were not part of planning issues during the 1950s.

It was not uncommon for a four-block area containing about 50 homes from the area around Alexander Street between Fenwick and Steers Avenue to be flooded to three feet or more. Floods also occurred around Gifford Road and McDonald Avenue

The Woodlawn area also suffered from development pressures for apartment houses, condos, used car lots, bridge repairs, assisted living facilities, off road vehicles, vandalism, property damage, youth problems, drug and alcohol abuse, road construction, and illegal dumping.

In 1986, the city passed a law prohibiting the operation of vehicles in parks and landfills and on other public lands in the city. While there was much fanfare from the city council during this time to curb the ATV use, this still occurs today in the preserve area although the police have made sweeps and arrests in recent years.

In 2003, the city considered selling part of the preserve to a local builder, reneging on the 1969 "Forever Wild" ordinance. The developer wanted to build a 240-lot housing development called Locust Grove. Opposition to this from residents and environmentalists along with city council members finally killed the plan. The following year the city considered selling 10 to 12 acres of parkland to build 84 luxury town houses next to the municipal golf course.

In 2006, the city decided to abandon development plans for all sections of the Woodlawn Preserve and decided to develop a management plan for it. To further these goals, the Woodlawn Comprehensive Plan created by Schenectady 2020 has as one of its goals in Action 2:

"Prepare a master plan for Woodlawn Park and evaluate a range of uses including recreation and housing."

Additionally, Action 3 states:

"Formally protect Woodlawn Wildlife Habitat and Preserve and designate it as park land.

Tasks:
Provide local protection to Woodlawn Preserve, a globally rare eco-system now recognized on the State Open Space Resources Plan, prevent dumping in the preserve and limit intrusion by ATV's."

In 2006, the city of Schenectady initiated a grant request to develop a master plan for the Woodlawn Preserve and to look at the conditions of the open space surrounding the preserve and make recommendations.

Preservation of the Woodlawn Preserve and surrounding undeveloped pine barrens has been designated by all municipalities as worthy of preservation as seen from excerpts from local plans relating to the Woodlawn/Western Pine Bush Conservation Plan project:

Schenectady 2020 Comprehensive Plan

The City of Schenectady adopted the Schenectady 2020 Comprehensive Plan on March 24, 2008. The need for formal permanent protection of the Woodlawn Preserve has emerged throughout this planning process:

In the Community Profile:

"At 135 acres, the Woodlawn Preserve is the largest passive park in the City of Schenectady. The Woodlawn Preserve, located in the Woodlawn Neighborhood at the Schenectady - Colonie municipal line, is an undeveloped, rare natural community and wetlands with a unique ecosystem that is home to several rare species. The Woodlawn Preserve is part of the same ecosystem as the neighboring Albany Pine Bush Preserve. The low areas of the property are Class I freshwater wetlands and the high areas (or upland) are historically known as a pitch-pine scrub oak natural community. According to the New York State Open Space Conservation Plan, it "includes several remnant features of the Pine Bush, including sand plain and dune formations, pitch pine-scrub oak barrens, and historic Karner blue butterfly habitat, which while currently unoccupied, may be restored as a future reintroduction site. The area also supports several important wetland areas forming a unique complex of pine barrens and wetland habitats. It is currently listed on the State's Priority Projects List."

In the Woodlawn Neighborhood Plan:

Goal Six: Parks and Recreation – Maintain existing parks and green space and add new recreation amenities that appeal to children and young families as describe on the 2005 park improvement list.

"Action 3: Formally protect Woodlawn Wildlife Habitat and Preserve and designate it as park land. Tasks:

- Provide local protection to Woodlawn Preserve, a globally rare eco-system now recognized on the State Open Space Resources Plan, prevent dumping in the preserve and limit intrusion by ATV's
- Solicit funding to plan the nature preserve and passive park with trails and interpretative signage and a trail head at the Woodlawn School
- Partner with the Woodlawn Community Playground Project and the School District to develop a park and playground at Woodlawn Elementary School
- Partner with the School District to help maintain the preserve and to construct an adjacent playground
- Create greenway linkages to other Pine Bush locations in the region and to other green and park resources in the City
- Expand the preserve to include the City-owned parcels and paper streets along its borders
- Address ongoing dumping in the Woodlawn Preserve and clean out debris"

In the Visioning Workshops:

What I Love About Schenectady – "Woodlawn Preserve – unique environment area – globally rare ecosystem"

What Needs to Change in Schenectady – "There needs to be formal permanent protection for the Woodlawn Preserve"

What Will Schenectady Be Like When Things Have Changed – "All Pine Bush properties will be connected to each other and to the Hudson and the City's Parks will be connected by a greenway"

In the surrounding towns, the Woodlawn and greater Western Pine Bush have been addressed as well:

Town of Niskayuna 2003 Comprehensive Plan

The proposed project area is included in the Cultural & Recreational Facilities Section of Niskayuna's 2003 Comprehensive Plan: "a potential recreational area exists in the southwest corner of town. Given its regulated status, paper streets in the wetlands should be removed and the area either rezoned for Land Conservation or otherwise protected via an overlay district or special permit process. Since this same wetland extends into the Town of Colonie and the City of Schenectady, a unique opportunity is presented for the creation of an intermunicipal recreation area". Relevant Plan objectives include: "The Town should target appropriate land acquisitions and improvements to meet identified recreation program needs; The Town should establish a greenway system that permits the connection of parks and open space, allows pedestrian and bicycle access and conserves remaining natural habitats within the Town; and the Town should update its park, open space and recreation plans to document existing open space and parkland resources while envisioning future developments and resident needs".

Town of Rotterdam 2001 Comprehensive Plan

The proposed project is consistent with 3 of the 5 main goals of the Town's Comprehensive Plan: "1 - Provide an effective stewardship of the environment to protect critical and sensitive areas, maintain water quality, and conserve land, air, water, and energy resources by taking advantage of existing plans or ongoing planning activities such as watershed management plans, regional and local transportation plans, and other resource protection plans; 2 - Enhance opportunities for recreational and cultural activities for all ages; and 3 - Encourage changes that promote a healthy environment in which to live by encouraging responsible development that limits noise pollution and traffic congestion, provides for pedestrian safety, discourages growth in environmentally sensitive areas, protects cultural resources, and provides high quality community design". In recognition of the sensitive natural areas contained within the town's borders, a Town objective is "to continue efforts to ensure ongoing protection of these important natural resources".

The Town of Rotterdam is currently involved in formal Open Space Planning within Town boundaries. The areas targeted in the Woodlawn/Western Pine Bush Conservation Plan project have also been identified as priority conservation areas in the Open Space Planning process.

Town of Colonie 2005 Comprehensive Plan (Open Space and Recreation Plan Component)

The Town of Colonie has devoted "an entire section of the comprehensive plan to discussing open space and recreation resources". The proposed project area is included in the Town's Identified "conservation areas", which also include portions of the Albany Pine Bush Preserve. The Plan recommends the following actions identified conservation areas: "5.4.1 Consider acquisition of open space from willing sellers or donors; 5.4.2 Encourage the use of Incentive Zoning; 5.4.3 Require the use of Conservation Subdivision Design as development occurs; 5.4.4 Develop a Parks and Recreation Master Plan; 5.4.5 Identify and pursue potential funding sources for conservation activities; and 5.4.6 Initiate and continue to foster partnerships".

Schenectady County Open Space Plan (in process)

Schenectady County has been involved in a countywide identification of areas of interest for open space planning. The areas specified in the Woodlawn/Western Pine Bush Conservation Plan project have also been identified and targeted as priority conservation areas in the County Open Space Planning process.

The adoption of the plan and its strategies to protect environmentally significant areas will improve predictability in land use for the involved municipalities and assist in planned, appropriate development using related land use regulations and procedures.

Current Conditions in Study Area

The Woodlawn Preserve is considered parkland in the city and was classified as such as early as 1925 (see Figure 3). The 1969 local law was designed to protect the preserve although the city allowed development along Gifford Road and other sections.

Pine Barrens lands around the preserve are located in the Towns of Rotterdam, Niskayuna, and Colonie (Albany County). Each of these municipalities has zoned their respective tracts. Development conditions for these zoning designations can be found in the Appendix III.

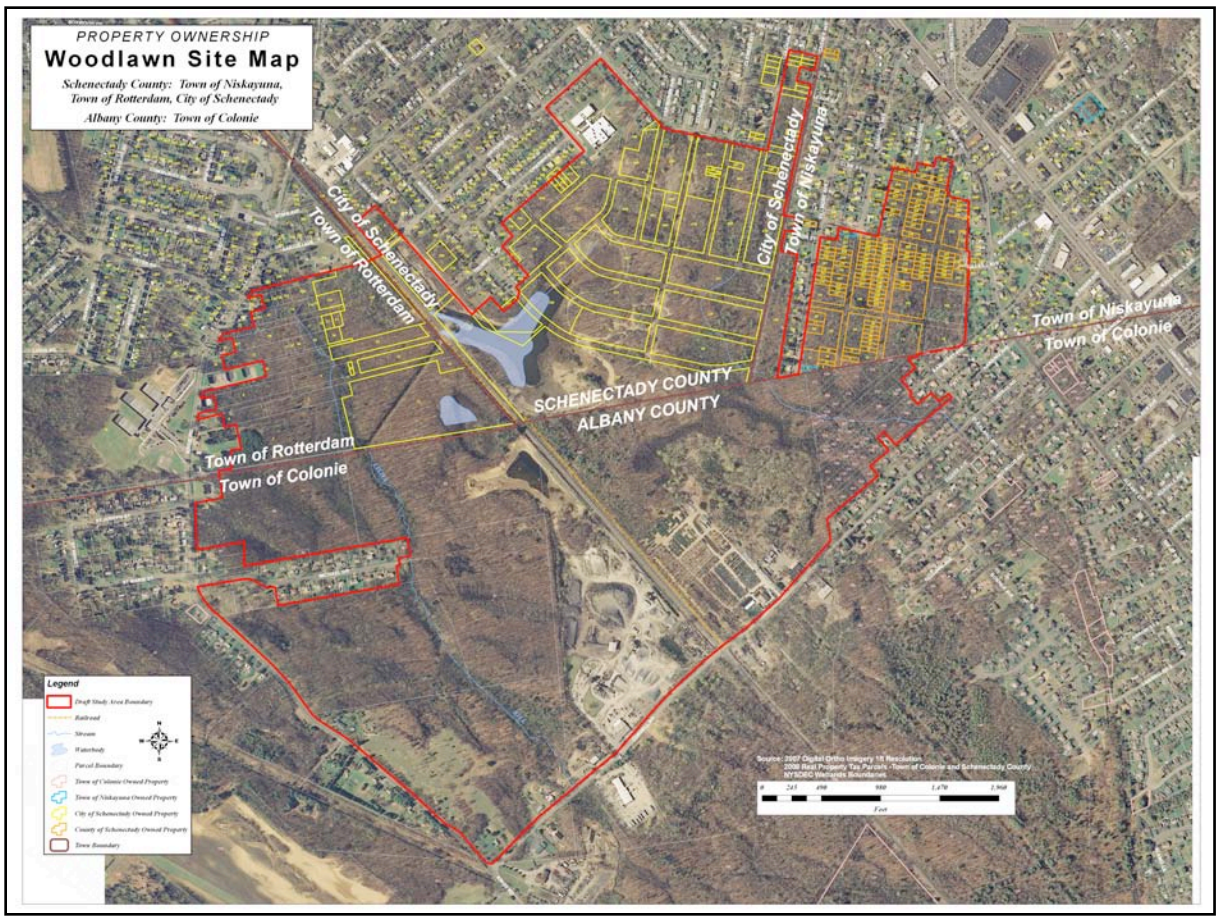


Figure 7. Current site conditions in greater Woodlawn study area.

Town of Colonie

That section of undeveloped Pine Barrens in the Town of Colonie is classified as Single Family Residential (SFR) south of Callanan Industries and Commercial Office (CO) and a smaller section Single Family Residential (SFR) north of Callanan. Furthermore the town implemented an environmental overlay district on top of this zoning.

An intrusion into the southern section called Michael Drive is a development of about 20 single-family homes with street. The development ends at the Lisha kill, which bisects this section of Pine Bush in a northwest-southeast line. This development is excluded from the study area. To the right of this development is a sizable piece of land purchased by the Nature Conservancy and runs northeasterly to the line of Callanan Industries and west with the Lisha Kill as the western boundary.

Commercial and residential development lines the north side of Cordell Road. The study area ends here at Samherst Avenue

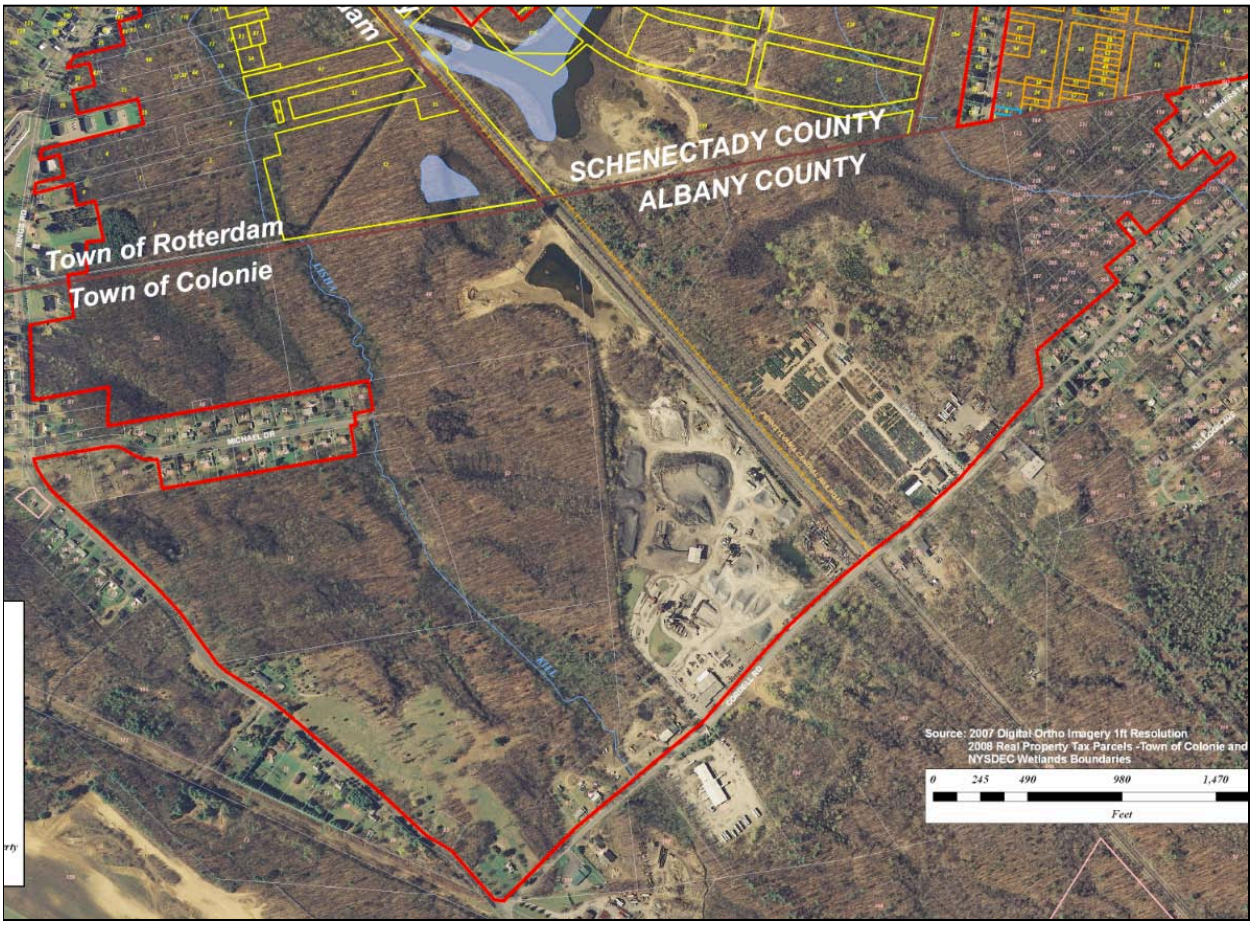


Figure 8. Current conditions in the undeveloped Pine Barrens located in the Town of Colonie.

Town of Niskayuna

The 19+ acres of wetlands in the Town of Niskayuna has been rezoned or designated land conservation.

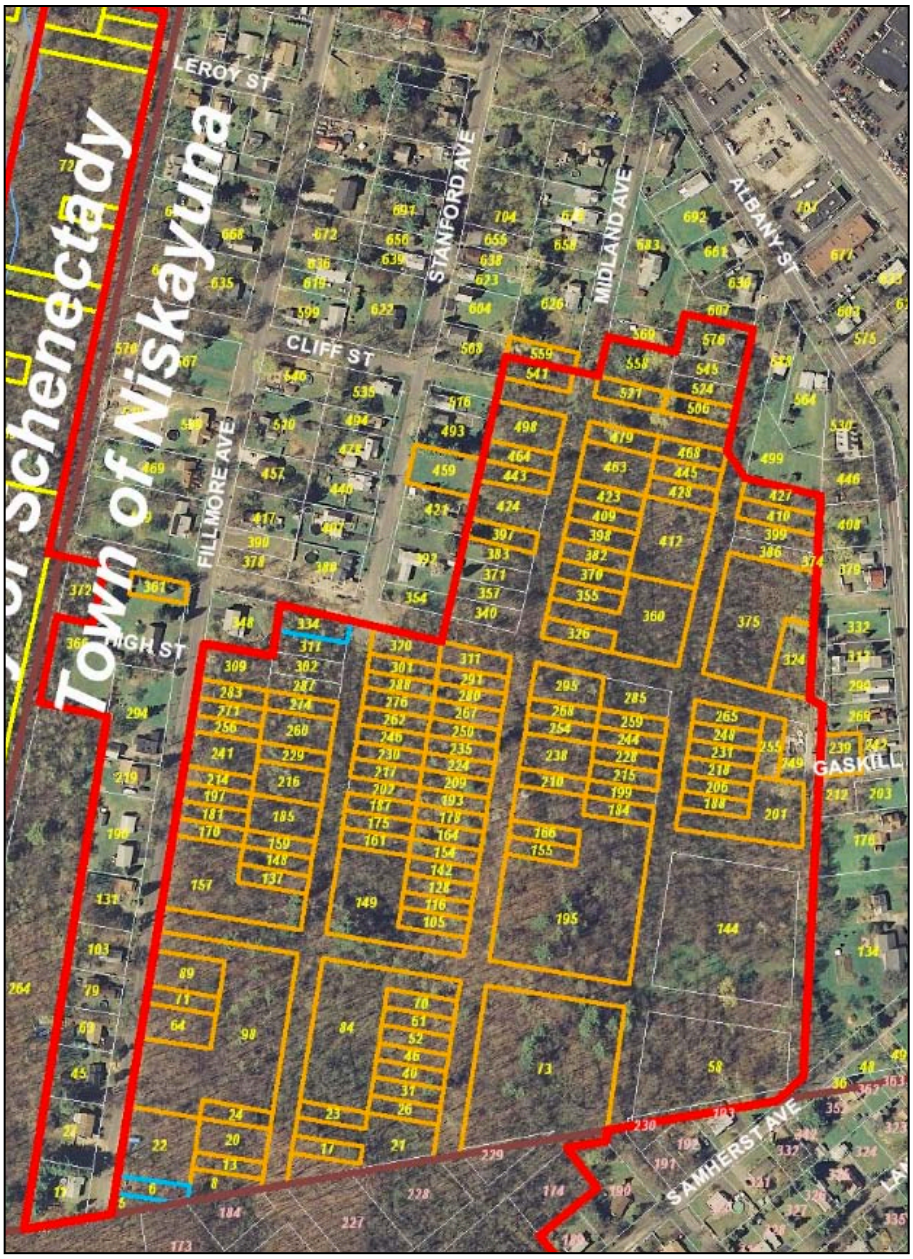


Figure 9. Current conditions of undeveloped Pine Barrens in the Town of Niskayuna.

Town of Rotterdam

A sizable piece of Pine Bush is owned by the City of Schenectady in the Town of Rotterdam and is on the opposite side of the railroad tracks opposite the pond. This amounts to nearly half of the undeveloped section of Pine Bush in the Town. The other half in Rotterdam is undeveloped although a few homes are located along the western boundary that is Kings Road.

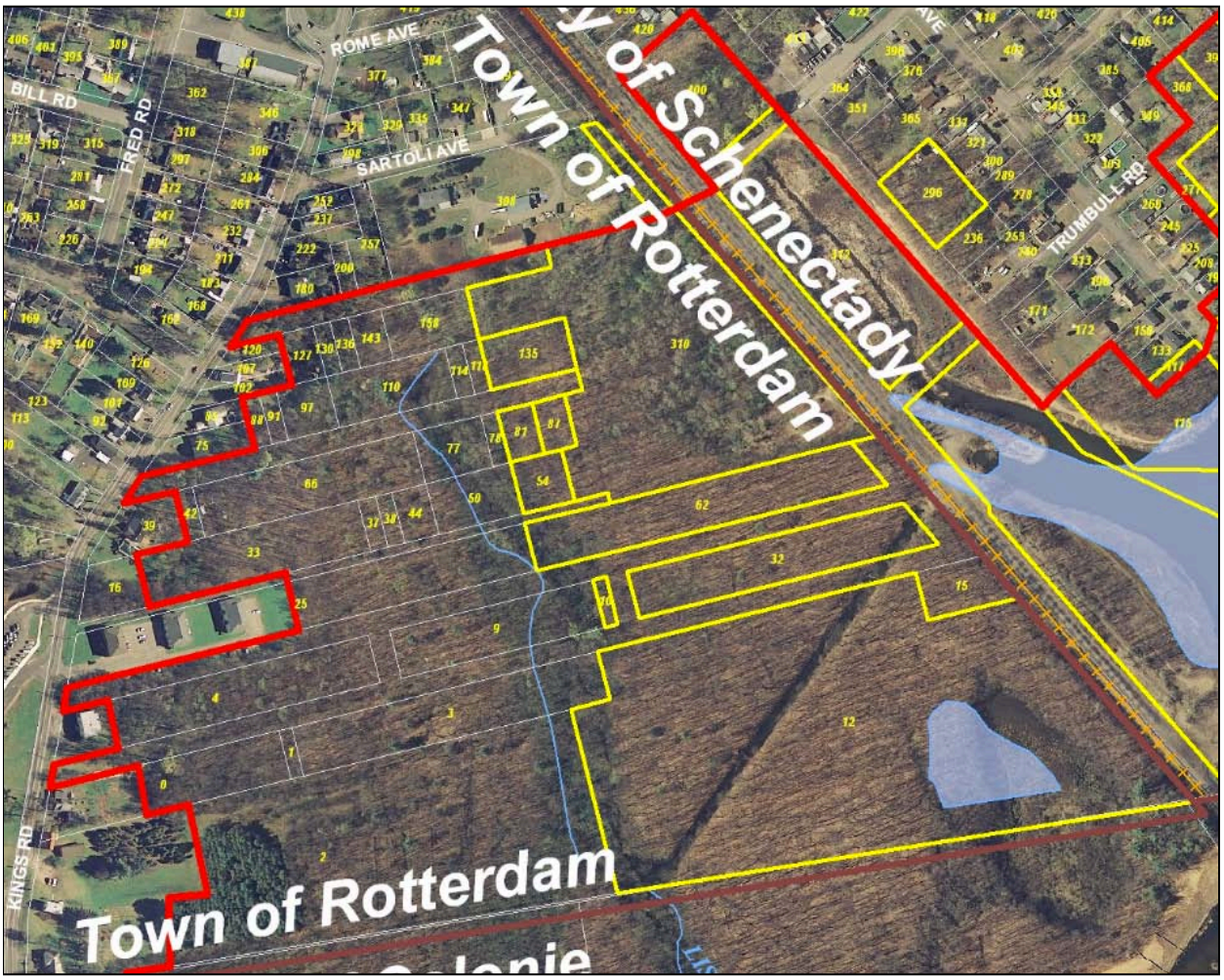


Figure 10. Figure. Current conditions of undeveloped Pine Barrens in the Town of Rotterdam.

The section within the Town of Rotterdam is zoned Multifamily Residential, Agricultural, and Retail business.

All of these undeveloped portions are suitable for preservation and inclusion into the Woodlawn Preserve into a great "Western Pine Barrens Preserve." As the Vrooman Family owned much of this land historically, a local historian, John Wolcott, suggests the Preserve would be better named the Vrooman Woods or perhaps another more descriptive name would be the Vrooman Pine Barrens Preserve.

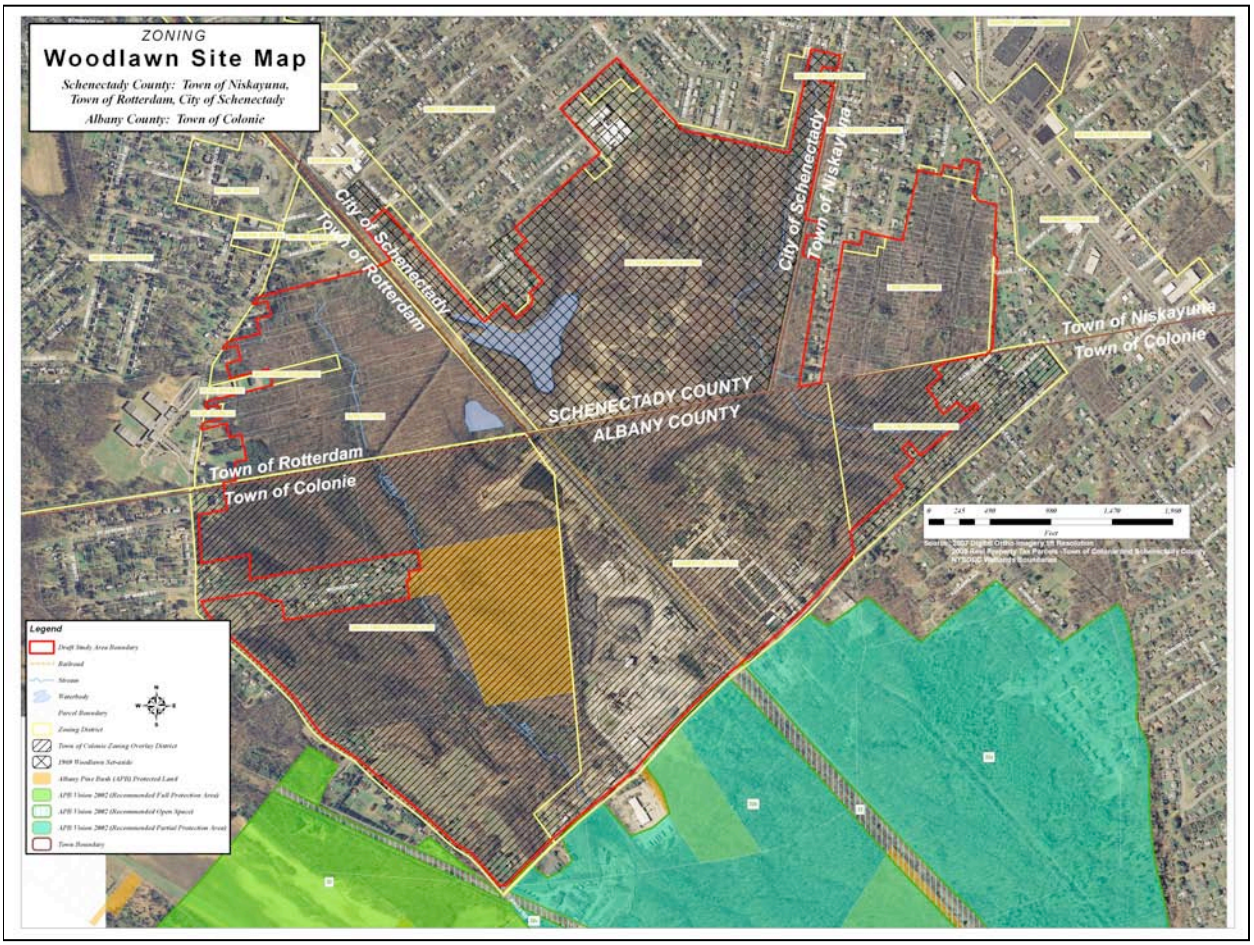
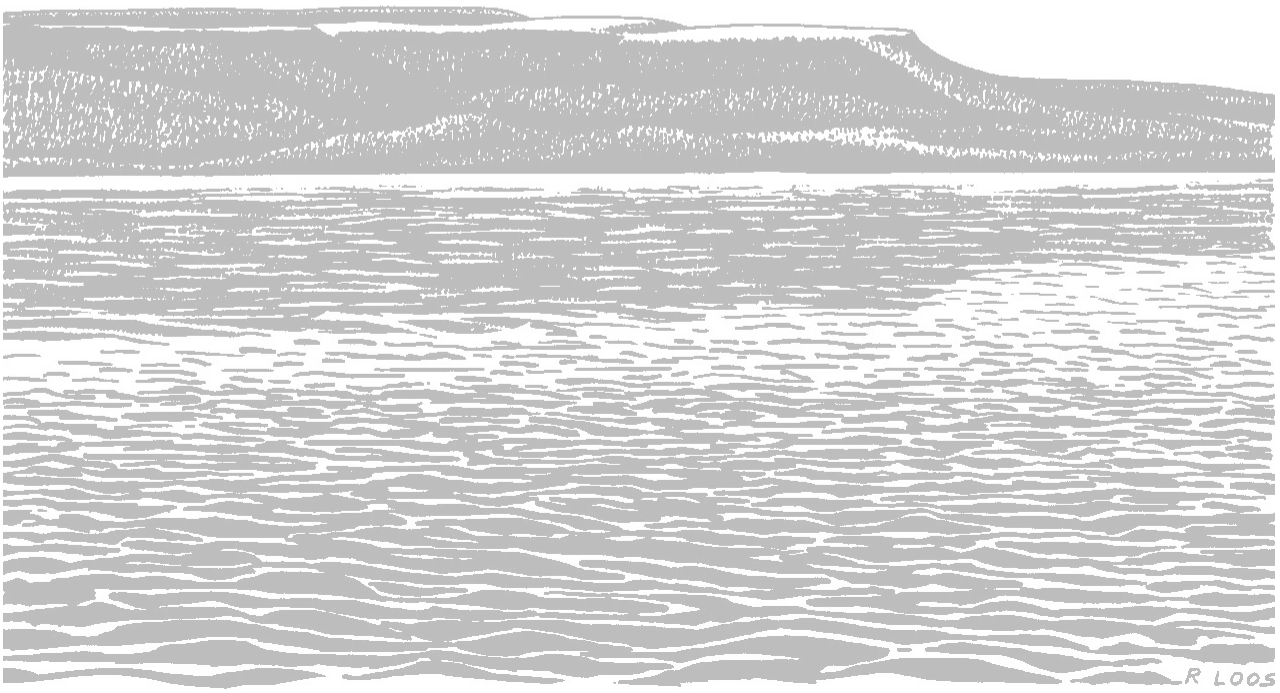


Figure 11. Map showing current zoning conditions and Pine Bush acquisition priorities in western Pine Bush.

Once the Woodlawn Preserve has been restored to a pine barrens habitat a revised management plan will be developed to manage in perpetuity that ecosystem. This plan is designed to initiate the proper procedure to get the Woodlawn Preserve moving in that direction.

GEOLOGY



The Hudson-Mohawk Lowlands
by Don Rittner

Mountains surround the broad and rolling lowlands of the Hudson and Mohawk River Valleys. To the north lie the Adirondacks, while the Catskills and Shawangunks lie to the west, and the Taconic Mountains and Hudson Highlands to the east. The Helderberg Escarpment represents the southern border of the Mohawk Valley.

The foundation of this region, formed mostly during the Middle and Late Ordovician Period, that is the bedrock of the Mohawk region, is composed of shale, siltstone, sandstone, limestone and dolostone. These rocks are mostly soft sedimentary rocks and easily eroded and form low plains while the harder resistant rocks that remain tower over them.

Figure 12. The bedrock of the Schenectady region was laid down as sediments in shallow seas during the Ordovician Period more than 400 million years ago (MYS). Top left: Early Ordovician 480 MYA. Lecanospira-bearing rocks are deposited; Top Right: Early Medial Ordovician, 465 MYA. Stropmatoporoid-bearing rocks of the Chazy Group were deposited; Bottom Left: Late Medial Ordovician 400 MYA. Cryptolithus-bearing rocks of the Trenton Group are deposited; Bottom Right: Late Ordovician, 430 MYA. Taconic Orogeny creates Taconic Mountain chain. Source, NYS Geological Survey.

In the Adirondacks and Hudson Highlands the harder rocks are mainly metamorphic, while in the Shawangunks, hard sandstones and conglomerates predominant. The Helderbergs are made up of mostly carbonate rocks. Finally, the Taconic Mountains are metamorphosed shale and sandstone and run generally north-south. This is the result of the collision between the volcanic arc and the proto-North America tectonic plate, which marks the Taconian Orogeny. This collision pushed rocks from western Massachusetts into New York about 450 million years ago.

During most of the Ordovician time, the Appalachian Mountain region, the great Mississippi Valley, and much of the far western region were almost always under water. In effect, New York State was completely submerged under the Ordovician sea except for the Adirondack Island and water conditions around the island.[1]

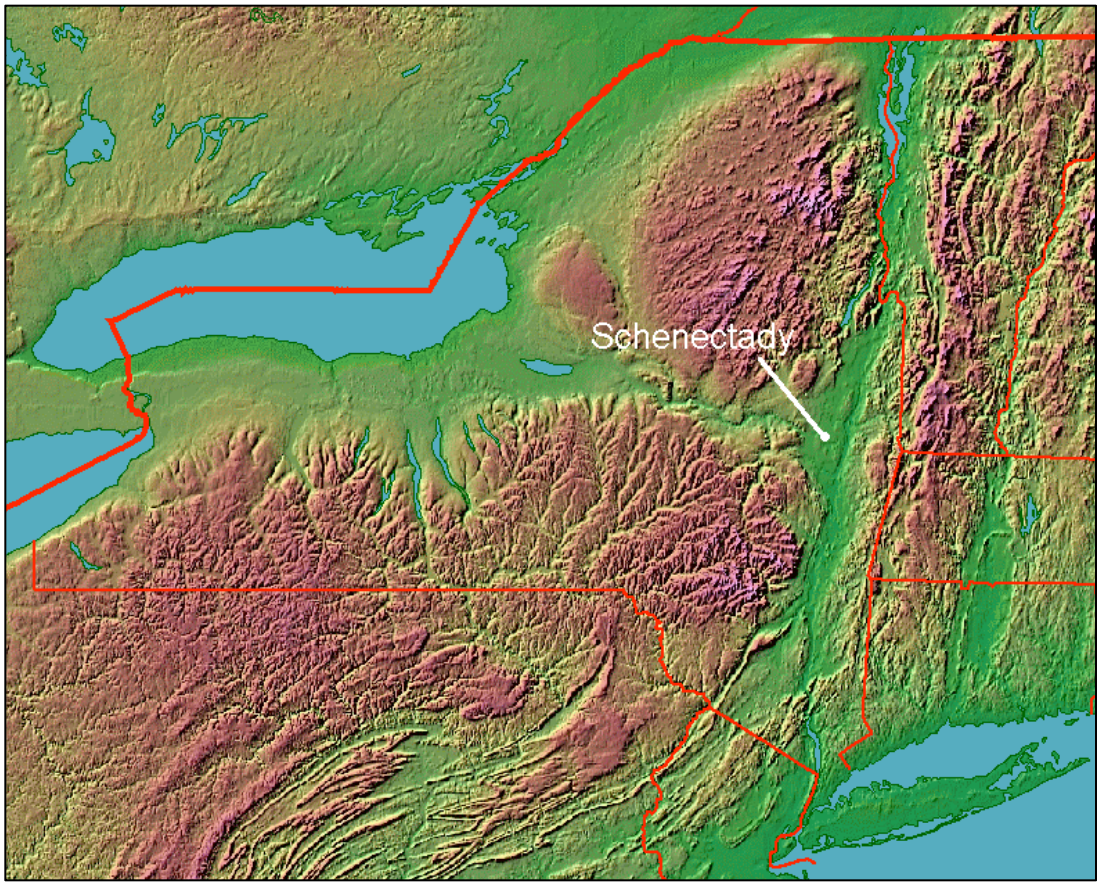


Figure 13. The erosion of soft and hard rocks has played a key role in the physical development of the Schenectady region. Schenectady becoming the gateway to the west is based on this simple geological fact. This satellite image shows the Mohawk Valley lowlands as a natural break through the Appalachian Mountain chain. Source: USGS.

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[1] The Geological Historic of New York State. William J. Miller. 1913. New York State Museum Bulletin 168, pps.44-51. Geology of New York – A Short Account. 1966. New York State Museum and Science Service Educational Leaflet 20, pps 47. Geology of New York – A Simplified Account. 1991. Y.W. Issacsen, E. Landing, et al., pps 265.

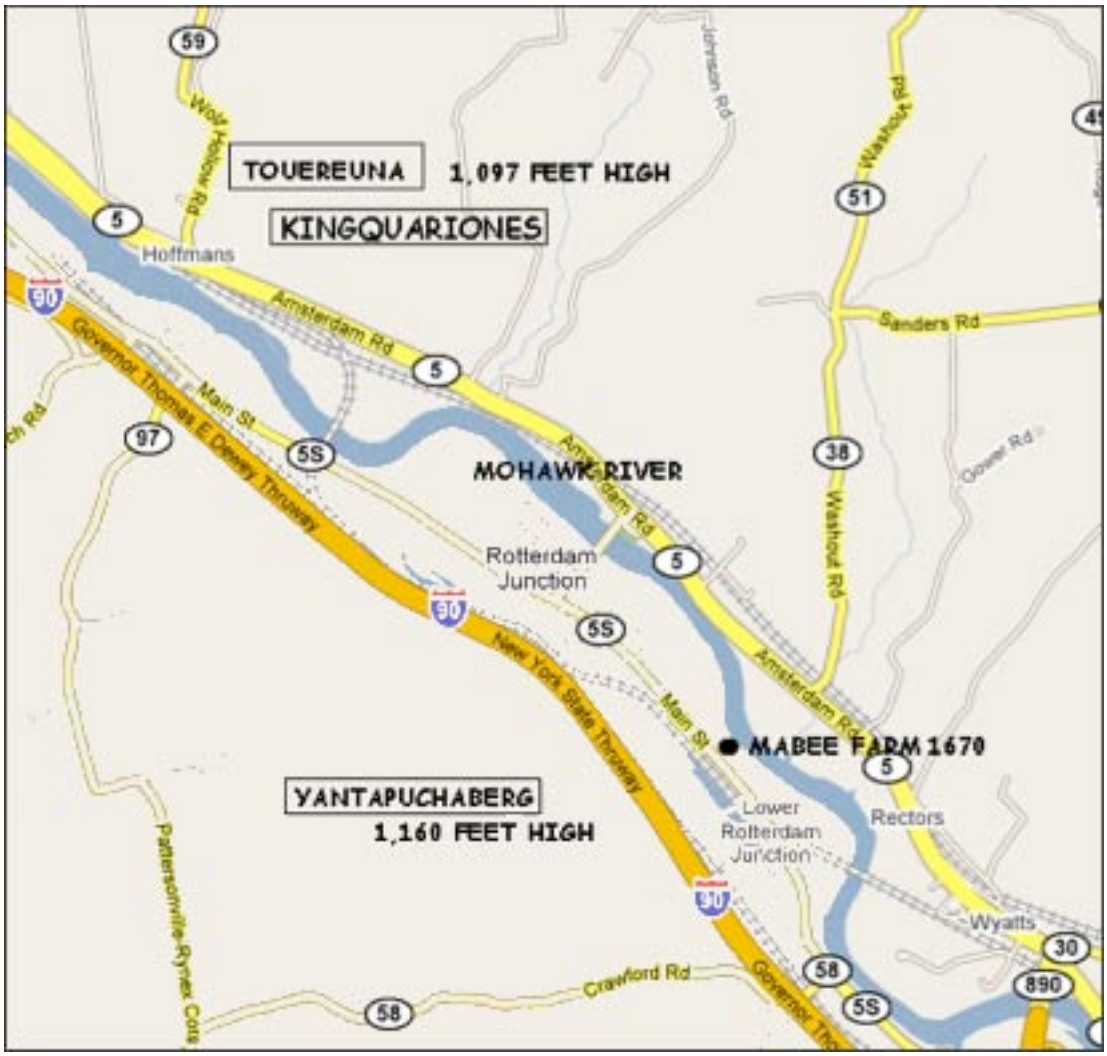

Figure 14. Two largest elevations in the Schenectady region are Yantapuchaberg (Yantapuchaberg (Dutch for John-ear-in-the-corn-mountain) is pronounced Yan-ta-poosha-berg) at 1160 feet and Touereuna at 1097 feet high located in Rotterdam Junction and the Town of Glenville. Touereuna is on the north shore of the Mohawk, and along with Yantapuchaberg forms the"neighboring hills," although Touereuna is now used only to describe the hill on the north side. These two hills form the eastern door of the Iroquois "Longhouse." An area off Wolf Hollow Road that leads up to Touereuna is called Kingquariones and marks the battle between Mohicans and Mohawks in 1669. [2]

The Mohawk Valley while small has great importance because it separates the Adirondack highlands on the north from the highlands of the Catskills and Southwestern plateau provinces on the south. It is the lowest passageway across the mountains between the St Lawrence River and

[2] . *The Old Mohawk Turnpike Book.* 1924. Nelson Green. Nelson Green, Publisher. Fort Plain, NY. 291 pps.

the southern end of the Appalachian range. This natural break has made the Mohawk Valley one of the most important gateways to the west.[3]

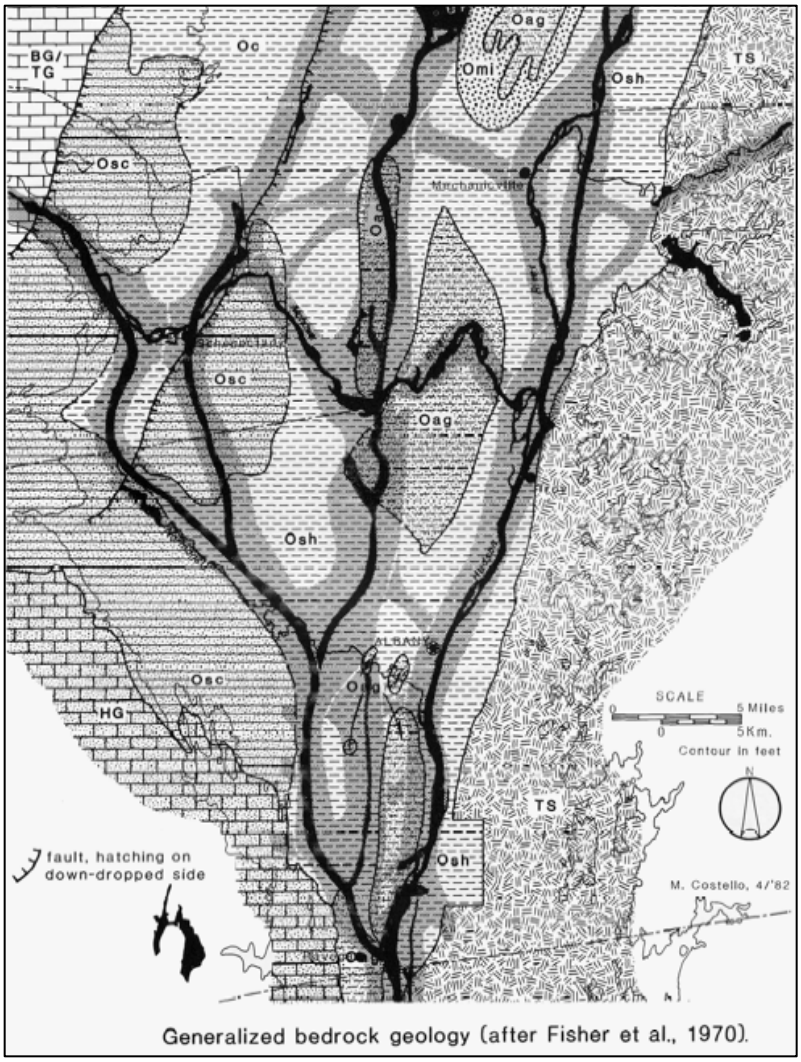

Figure 15. Bedrock under Schenectady

The underlying bedrock of the Schenectady region is made up of sedimentary rocks in the Schenectady Formation-Osc (sandstone and shale) and Canajoharie shale – Oc

Glacial Geology.

Before the advance of glaciers through the Hudson-Champlain Lowlands, and the Capital District region in particular, the physical makeup of the area contained numerous valleys and

[3] *The Geological Historic of New York State*. William J. Miller. 1913. New York State Museum Bulletin 168, pps.19-21. G*eology of the Capital District (Albany, Cohoes, Troy and Schenectady Quadrangle*s. 1930. Rudolf Ruedemann. New York State Museum Bulletin No. 285, pps 215.

rivers. These lowlands are underlain by a number of folded and faulted Ordovician chert, sandstone, greywacke, and shales. In our region there were twelve pre-glacial valleys: The Schagticoke, Hoosic, Delphus Kill, Guilderland Center, Voorheesville, Vloman, Onesquethaw Channels along with the Patroon, Corning, Wemple and Selkirk Gap, and Corning Connection. After the recent ice age activity, seven post-glacial valleys were developed: Ballston Creek, Anthony Kill, Jonesville, Elnora, and Dwaas Kill Channels along with the Rexford and Crescent Reach.

The Colonie Channel was the principal drainage of the Hudson Champlain Lowlands during pre-glacial time. These channels developed along the easily eroded shale zones and created a trellis drainage pattern due to more resistant bedrock of greywacke and sandstone creating ridges between the valleys. All of these channels are now buried as a result of the last Ice Age retreat. [4]

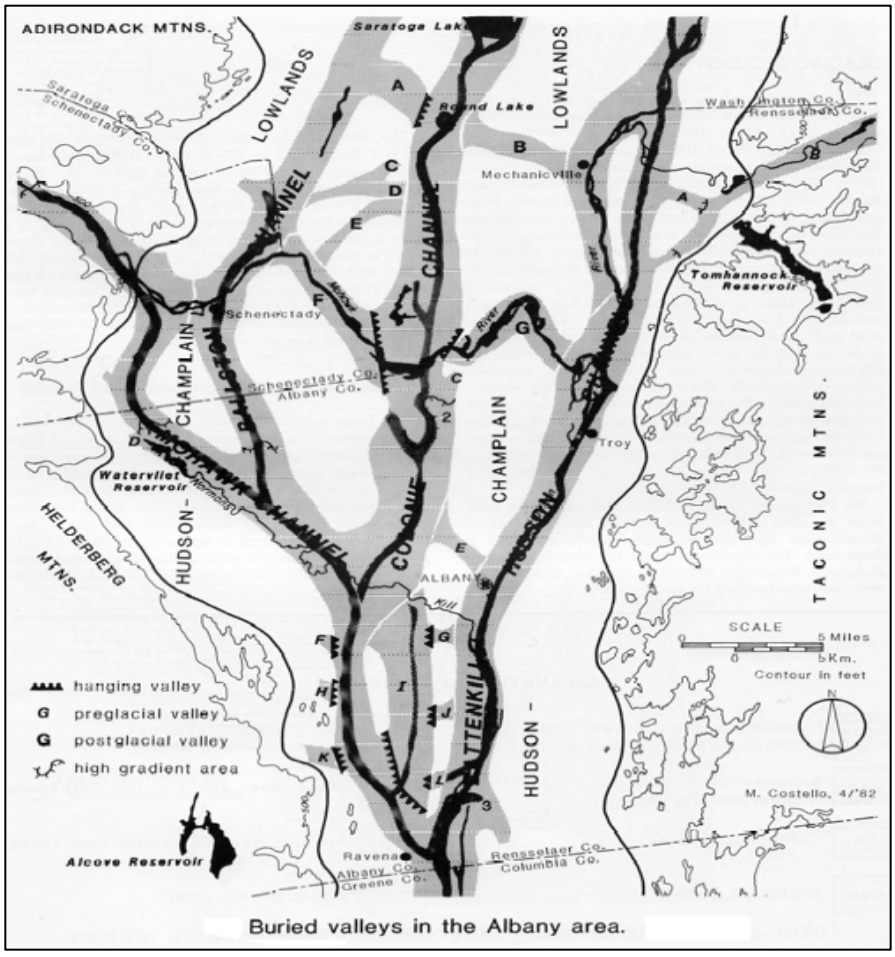

Figure 16. Several buried river and stream valleys underlay the Capital District.

[4] *Bedrock Topography and Glacial Deposits of the Colonie Channel Between Saratoga Lake and Coeymans, New York*. Robert J. Dineen. 1983. New York State Museum Map and Chart Series Number 37, pps. 1-24.

In Schenectady, two buried valleys underlay the region, the Ballston Channel that runs through the city and the Mohawk Channel (not present Mohawk course) that runs further south and west of the city. The Ballston Channel is steep-walled and flat-bottomed, while the Pre-glacial Mohawk Channel is U-shaped. The Ballston Channel is 100 feet deep and 3200 feet wide and contains little or no till or lacustrine deposits. It has several rock floored terraces and a very steep-walled hanging valley. The Pre-glacial Mohawk is 450 feet deep and 8,000 feet wide and contains thick glacial deposits.

The Lowlands were covered by the Hudson Lobe of the Laurentide Ice Sheet during the Woodfordian Stage of the Wisconsin Glacier episode. This lobe of ice generally flowed south scouring the bedrock surfaces, picking up large quantities of material and deposited it as till on the rocks surfaces, as sand and gravel masses at or near the margin of the ice sheet, or as clay and silt in the pro-glacial lakes that filled the low lying pre-glacial valleys discussed above. Much of the topography of the Schenectady region is based on the activities of this glacial episode, shaping the surface of the region into well known geographical landmarks.

South of Schenectady's Maywood section is an Esker Complex that is 5000 feet long and 1000 feet wide. Another Esker Complex is in Scotia, west of Glenridge that is 3000 feet long and 1000 feet wide. A large sand delta was deposited by the Glacial Mohawk River into Glacial Lake Albany at the +335 ft level, which thins to the east and south. This delta deposit makes up the famous Albany Pine Bush and Woodlawn Pine Bush section and is known as the Mohawk or Schenectady Delta.

Four named freshwater bodies occupied the Hudson-Champlain trough during deglaciation; in descending order Glacial Lakes Albany, Lake Coveville, Lake Fort Ann, and Lake Greens Corners.[5] The Mohawk Delta was formed when the glacial Mohawk River emptied into Glacial Lake Albany, which covered much of the Hudson Valley from Newburg to South Glens Falls and covered the valley up to 450 feet about sea level at its highest level. Lake Albany deposits in the Schenectady region are mostly clays grading into sands. Clays predominated up to 300 feet. At the higher levels the clays become sandy and at 340 feet above sea level sand predominates.[6] The Mohawk Delta is highest in Schenectady and gradually slopes down to about 200 feet at Albany. The Mohawk River, now confined to its present channel, cut into the western edge of these sand and clay deposits after the ice left the region. After the draining of Lake Albany, these

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[5] *Lake Albany Redux*. Connally. 2003. G. Gordon and Cadwell, Donald H., Research and Collections, New York State Museum.

[6] *Glacial Geology of the Schenectady Quadrangle.* 1911. James H, Stoller. New York State Museum Bulletin 154, pps 19-21. *Ancient Water Levels of the Champlain and Hudson Valleys.* 1905. Jay Backus Woodworth. New York State Museum Bulletin 84, Geology 8. Pps 65-260.

sands were blown into sand dunes and covered with vegetation, and much of it is now known as the Albany Pine Bush.[7]

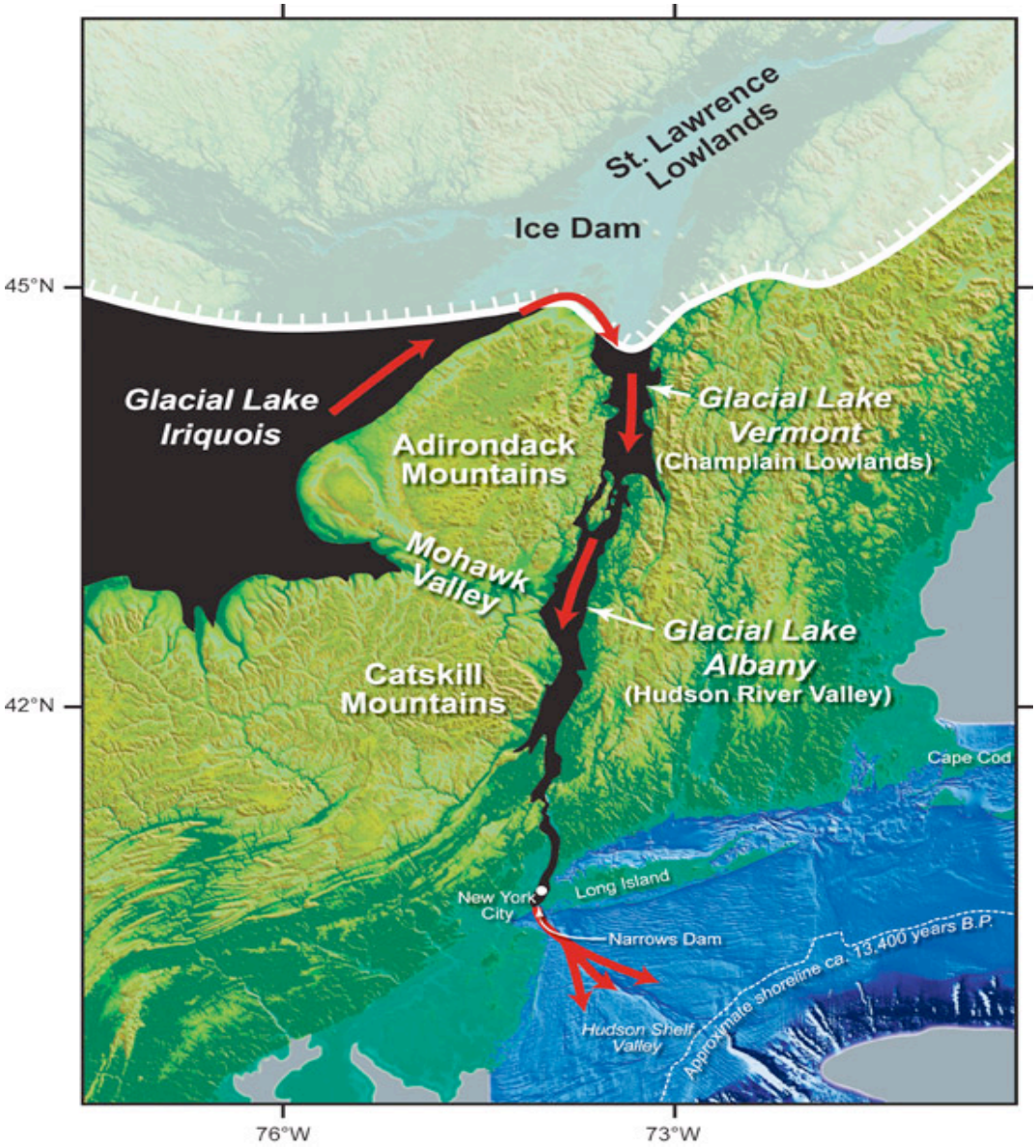

Figure 17. Paleogeography 13,400 years ago. Glacial Lake Iroquois is held back by an ice dam in northern New York. When that dam collapsed it drained (red arrows) into the lakes within the Champlain and Hudson Valleys, breaching the Narrows Dam (near New York City). It cascaded across the then exposed continental shelf to the North Atlantic Ocean. This release of meltwater reduced the flow of the Gulf Stream and caused an abrupt climate cooling in the Northern Hemisphere that lasted several hundred years. (Illustration by Jack Cook ©WHOI)

[7] *Pine Bush – Albany's Last Frontier.* 1976. Don Rittner, editor. *The Geology of the Pine Bush Aquifer, North Central Albany County, New York.* 1982. Robert J. Dineen. New York State Museum Bulletin 449, 38 pps.

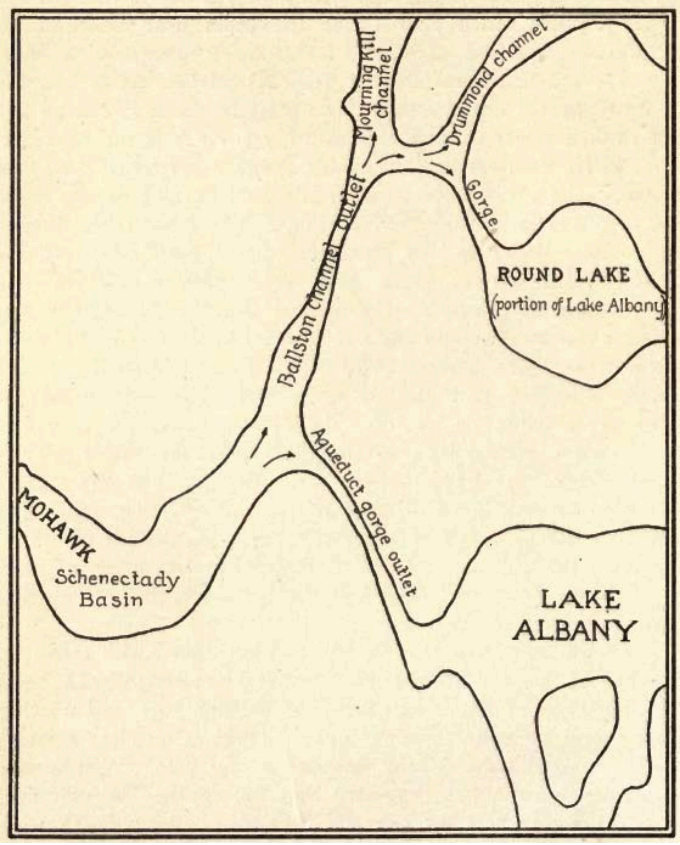

Figure 18. Sketch Map showing the distribution of land and water on the area of the Schenectady Quad when Lake Albany subsided to the level of about 320 feet. From Stoller (1913).

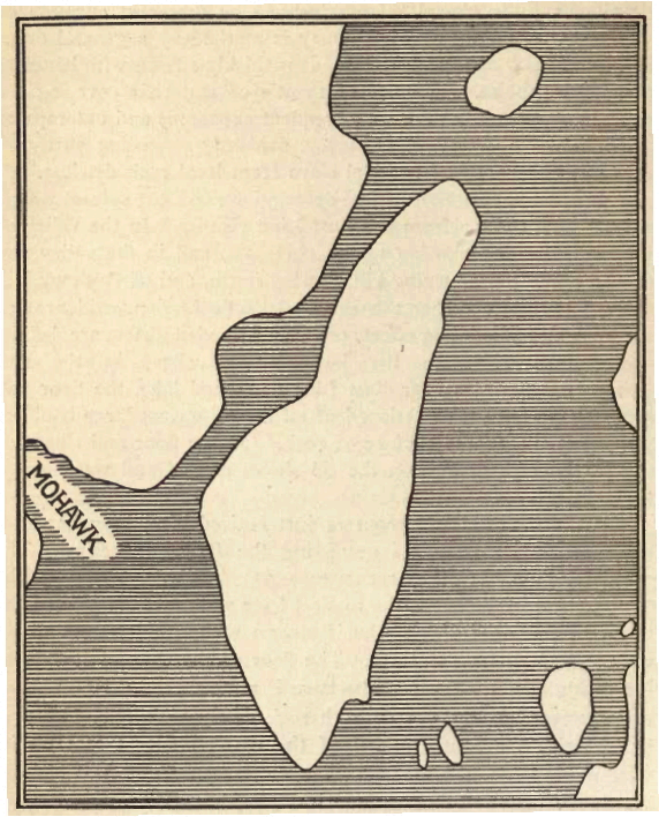

Figure 19. Sketch Map showing the distribution of land and water on the area of the Schenectady Quad when Lake Albany was at its height. From Stoller (1913)

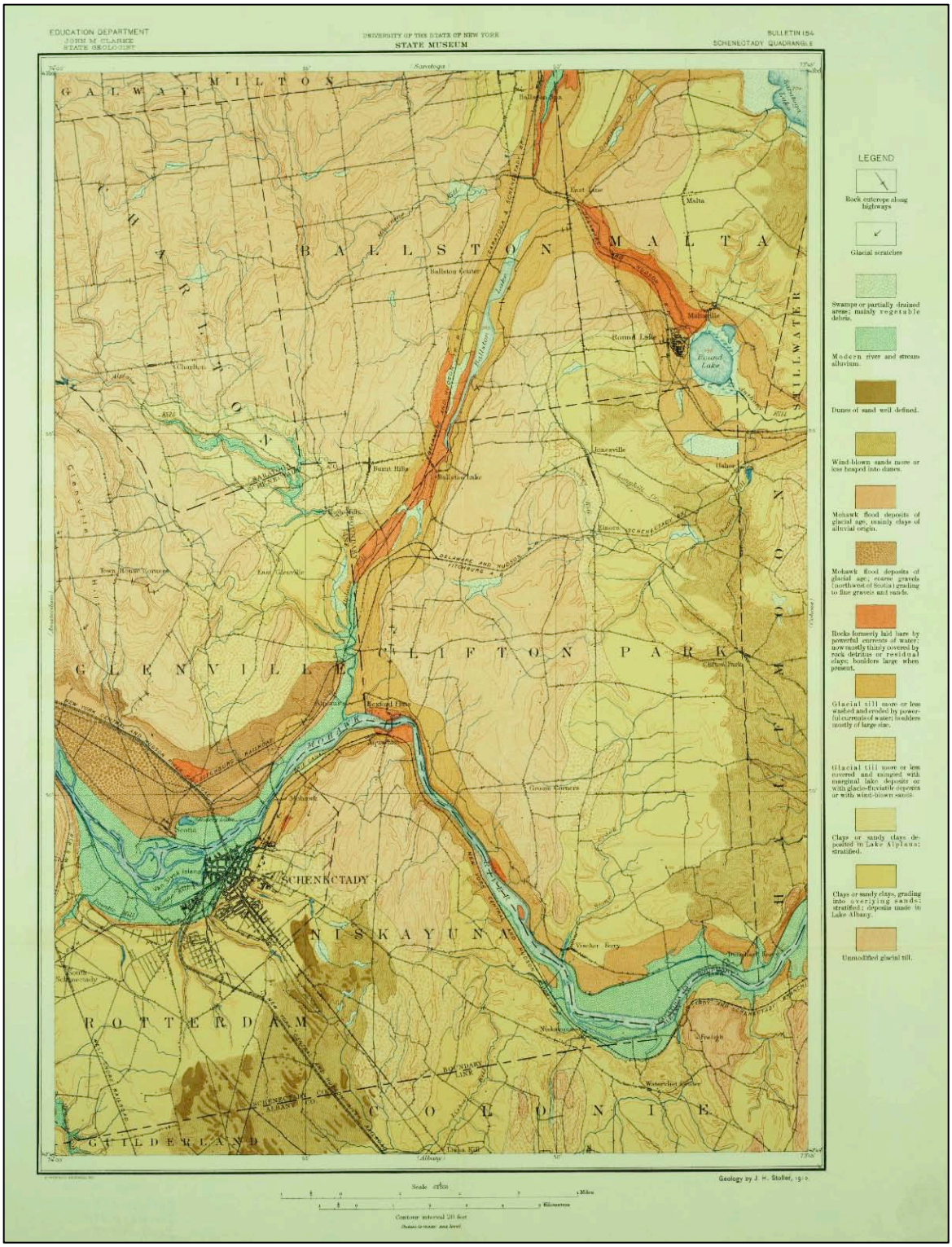

Figure 20. Surficial Map of the Schenectady Quadrangle. From Stoller (1913).

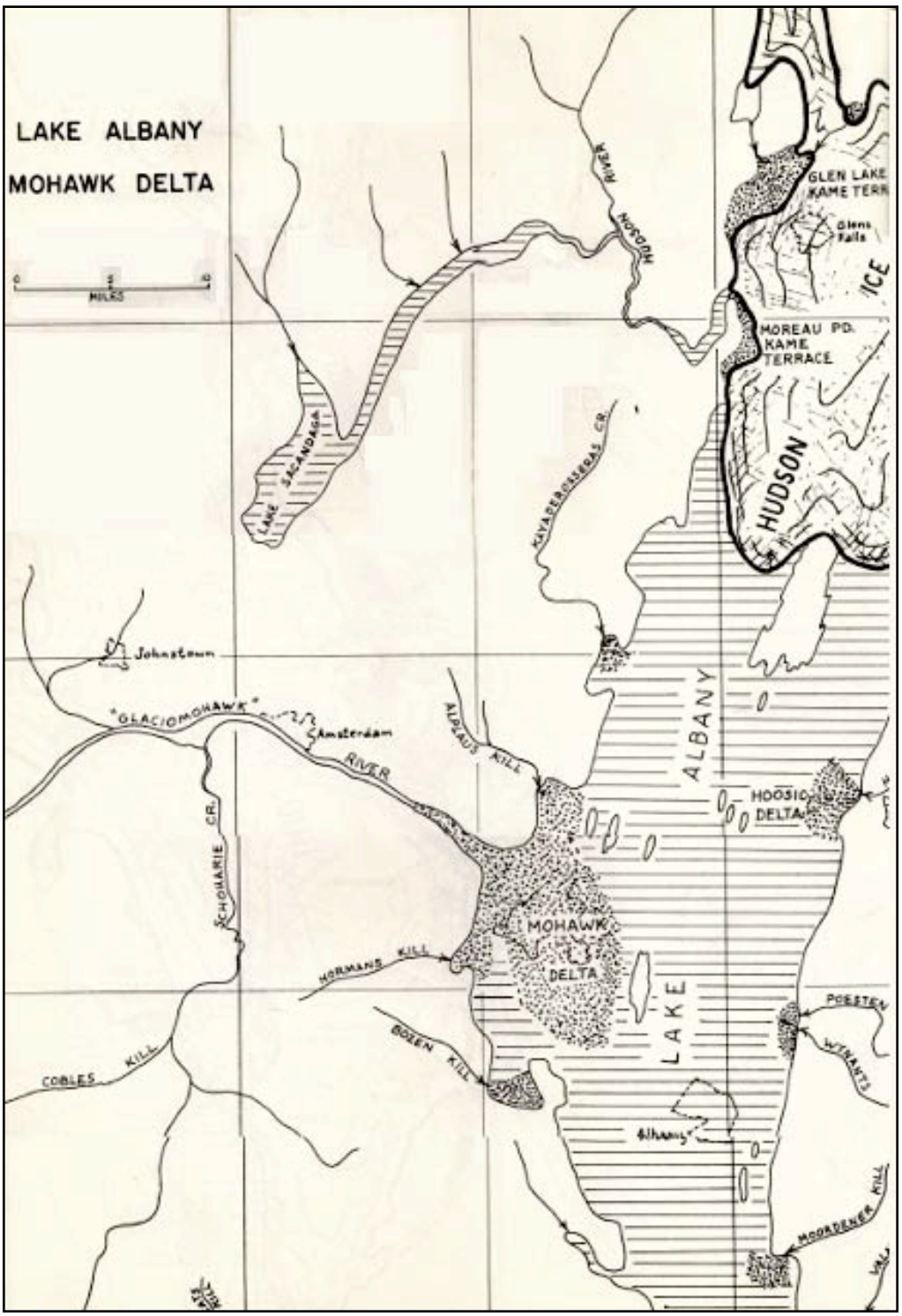

Figure 21. Formation of the Schenectady Delta which forms the geological foundation of the Pine Bush. From Rittner (1976).

After the final subsistence of the ice and glacial waters from the Schenectady region, alluvium was laid down on the flood plain of the Mohawk River and larger streams and the sands of the sand plains were blown into dunes. Four to five square miles of valley lands including the large islands in the Mohawk at Schenectady are composed of soils of alluvial origin. The Mohawk Delta swept into a series of sand dune events and became known as the Schenectady-Albany Sand Plain (the Pine Bush). The highest dunes attain a height of 400 feet.

Vegetation History

The vegetative cover of the Capital District changed considerably after the retreat of the last vestiges of ice around 10,000 years ago. Glacial Lake Albany began draining 15,000 years ago and receded from a high of 450 feet above sea level eventually giving way to the present level of the Hudson River at 0 feet (sea level).

The Holocene, the period after the Pleistocene, was characterized by higher temperatures and saw dramatic vegetational change over the Northeast. Following the retreat of the ice, trees migrated northward from southern regions at different rates depending on where they were located forming changing forest types than those that exist today. Some 9000 years before the present, the earth received about 7% more summer solar radiation than today resulting in 10% more dryness and there was less precipitation resulting in lower lake levels.[8] Fire also played a role, both natural and manmade, and has existed for thousands of years. In effect, the climate changed from a tundra like environment shortly after deglaciation to a forest of spruce-fir, followed by pine-oak, and then the mixed deciduous forest we have today. Pollen records show the advent of European colonization by an increase of Ambrosia (ragweed), Gramineae (grasses) ad Tubuliflorae (Compositae) in the 17th century.[9]

Latest research has indicated that the relatively warm and dry conditions of the Hypsithermal or Xerothermic Interval prevailed during the first half of Holocene time, roughly from 10,000 to 6500 years ago. The Xerothermic interval was warmer and drier, followed by cooler and wetter conditions until 6500 BP (before present).

After the final draining of Lake Albany, the Schenectady Delta was formed into sand dunes and a forest of pitch pine-scrub oak became dominant. The Pitch Pine forests became vitally important to the Dutch settlers of Albany and Schenectady. The deep incised streams and springs that drained the sand delta (and pine barrens) to the east (Albany) and west (Schenectady) provided water for drinking purposes and for commercial enterprise (mills, breweries, etc). In

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[8] Recent Centuries of Vegetational Change in the Glaciated North-Eastern United States
Emily W. B. Russell, Ronald B. Davis, R. Scott Anderson, Thomas E. Rhodes, Dennis S. Anderson
The Journal of Ecology, Vol. 81, No. 4 (Dec., 1993), pp. 647-664

[9] Holocene vegetation, climate, and fire history of the Hudson Highlands, southeastern New York, USA. Terryanne E. Maenza-Gmelch. New York University, Department of Biology, 1009 Main Building, Washington Square, New York, New York 10003, USA. The Holocene, Vol. 7, No. 1, 25-37 (1997).

Schenectady, these major streams included the Cowhorn Creek, Symon Groot's Kill (Hans Eenkluy's Kill), Schuylenberg Kill, and the Zand (Sand) Kill. Minor tributaries and springs at the ridges on top of the flood plain also contributed. All the major streams that emptied into the Mohawk River originated from the Pine Barrens. The fertile flood plains that were already known to the Native American population and became known as the "Groote Vlacht (big or great flats) or the Bouwlands to the Dutch were laid down only a few thousand years earlier by the Mohawk River.

Native American settlement is partially documented in the Mohawk Valley with much of the work conducted by the Van Epps Hartley Chapter of the New York State Archeological Association over the last 70 years or so. Very little evidence of PaleoIndian activity has been found and according to the PaleoIndian Database (http://pidba.utk.edu/main.htm), only one fluted point is recorded for Schenectady County (found by Gary Bernhard, former president of the Van Epps Chapter) and a total of 7 have been recorded for all the counties surrounding Schenectady. The geological processes already outline above precludes any major PaleoIndian occupation in the study area. The find by Bernhard could not be determined if it the provenience was local or as a result of being washed into the region.

COUNTY	Latitude	Longitude	SAMPLE
ALBANY	42.6029	-73.9717	2
RENSSELAER	42.7098	-73.5139	0
SCHENECTADY	**42.8149**	**-74.0660**	**1**
MONTGOMERY	42.9062	-74.4366	1
SARATOGA	43.1059	-73.8677	4

The 17th and 18th centuries (and part of the 19th century) fell into what geologists call the "Little Ice Age," a period of colder than normal temperatures. It is generally agreed that the Little Ice Age had three minima, beginning about 1650, 1770, and 1800/1850, each separated by slight warming intervals. The period of low solar activity in the middle ages led to atmospheric changes that seem to have brought on the Little Ice Age. Unusually low solar activity between 1645-1715 likely triggered the 'Little Ice Age' in regions like Europe and North America. The Little Ice Age brought bitterly cold winters to many parts of the world, but is most thoroughly documented in Europe and North America. The coldest part of the Little Ice Age was from 1645 to 1715.

This cold period had profound effects on civilization. Between 1694 and 1697 cold winters and cool and wet springs and autumns led to extreme famine in northern Europe.[10] On the contrary, the mild winter of 1672-73 prevented the French from invading the Dutch Republic. France and her allies sent 150,000 troops against a poorly trained army of 50,000 led by Prince William of

[10] Great Historical Events that were significantly affected by the Weather: 4, The Great Famines in Finland and Estonia, 1695-97. J. Neumann & S. Lindgren. Bulletin American Meteorological Society. Vol. 60., No 7, July 1979. Pp 775-787.

Orange. In 1672, the spring time was dry and water levels were low allowing hostile armies to cross water courses capturing most of the eastern section of the Republic. However, the Dutch flooded the low-lying areas creating an artificial moat of about 20 km around Amsterdam. The French, not equipped to cross the waters, waited for winter for the waters to freeze so they could then invade Amsterdam. However the winter of 1672-73 was mild and after several attempts by the French to cross - only to find the ice had thawed - the French gave up.[11]

Ecologist Johan C. Varekamp suggests that the Dutch exploration of North America for beaver pelts was a response to the Little Ice Age in Europe. He states that "Fur-lined coats (especially beaver pelt) were well-suited to keep the middle and upper classes warm in winter and the beaver furs were much more than a fashion statement –they were a bare necessity in the severely cold climate of the times."[12] – In effect, the coldest epoch of the Little Ice Age may have created a commercial incentive for the beaver and may have been the engine behind the desire to settle New Netherland.

Finally, it is not a stretch of the imagination to realize that if the night of February 8-9, 1690 was not as cold and snowy as reported, the French and their Indian allies would not have stopped at Schenectady but rather would have continued onto their main quest – Albany. Schenectady's history would have a different chapter indeed.

Soils of Woodlawn

The soils of Woodlawn Preserve fall into the class of soils typical of the Pine Bush. These are lacustrine or windblown sands mostly. The following descriptions are taken from the USDA *Soil Survey of Montgomery and Schenectady Counties, NY.*

Colonie Series

Colonie soils consist of deep nearly level to very steep, well-drained to excessively drained, coarse textured soils on deltas and lake plains. These soils formed in lacustrine and eolian deposits that are dominantly fine sand and very find sand. Much of Schenectady is underlain with Colonie series deposits.

The water table is generally several feet below the surface, but in places it fluctuates to within 3 1/2 feet of the surface. Permeability is rapid, except in the thin bands of the subsoil, where it is moderate to slow. The surface layers is very strongly acid or strongly acid.

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[11] Great Historical Events that were significantly affected by the Weather: 6, Inundations and the Mild Winter of 1672-73 Help Protect Amsterdam from French Conquest. J. Neumann & S. Lindgren. Bulletin American Meteorological Society. Vol. 64., No 7, July 1983. Pp 770-778.

[12] The New Netherlands colony in the 1600's: where climate change meets beavers. *Johan C. Varekamp, Earth & Environmental Sciences. Wesleyan University, Middletown CT 06459*

There are three types of Colonie soils:

CoA-Colonie Loamy Find Sand, 0 to 3 Percent Slopes

This nearly level soil has a thick subsoil and occupies deltas and lake plains. Areas tend to be large and broad and range from less than 25 to more than 200 acres in size. Included with this soil in mapping are small areas of the wetter Elnora, Junius, and Granby soils in slightly lower positions on the landscape, also included are small areas of Plainville soils and areas of soils that are similar to the Colonie soil but have more bands of subsoil.

CoC - Colonie Loamy Fine Sand, 3 to 15 Percent Slopes.

This undulating and rolling soil occupies deltas and lake plains at higher elevations than adjacent soils, which formed in lacustrine silt and clay. Nearly 65 percent of this soil has slopes of more than 8 percent. Areas are generally large and broad. They range from less than 15 to more than 100 acres in size.

Included with this soil in mapping are small ares of Plainfield soils and soils similar to Colonie soils that have more bands in the subsoil. Also included are areas of Burdett and Nunda soils in the Town of Niskayuna and spots of sandy soils that are 20 to 40 inches thick over compact glacial till.

CPE - Colonie and Plainfield Soils, Steep.

These soils have most of the surface layer removed through erosion. This mapping unit occupies hilly sand dunes, escarpments, and the walls of drainage-ways in deltas. Slopes range from 15 to 50 percent. Areas are generally long and narrow. They range from less than 10 to more than 50 acres in size. Some areas are irregularly shaped and mostly less than 50 acres in size. Areas are Colonie soils or Plainfield soils, or both. The surface layer ranges from loamy fine sand to sand. Included in this mapping unit are small areas of similar soils that have more bands in the subsoil. Also included are small areas of Hudson soils in the lower parts of drainage ways.

CoC-Colonie Loamy Fine Sand and CPE-Colonie and Plainfield are the soil type found in the Woodlawn Preserve.

Elnora Series

The Elnora series consists of deep, nearly level, moderately well drained, coarse-textured soils on glacial lakes and deltas. These soils formed in wind-or water-deposited sand.

The water table is within 18 inches of the surface during wet periods and permeability is rapid.

EN - Elnora Loamy Find Sand.

This nearly level soil occupies glacial lakes and deltas. Areas are broad and irregularly shaped. They are generally large and average more than 40 acres in size. The water table is high during some periods of the year.

This is the only type of the series and is found near the Schenectady/Albany boundary.

Granby Series

The Granby series consists of deep, nearly level, poorly drained and very poorly drained, coarse-textured soils on outwash plains, deltas and lake plains. These soils formed in water-sorted sandy deposits.

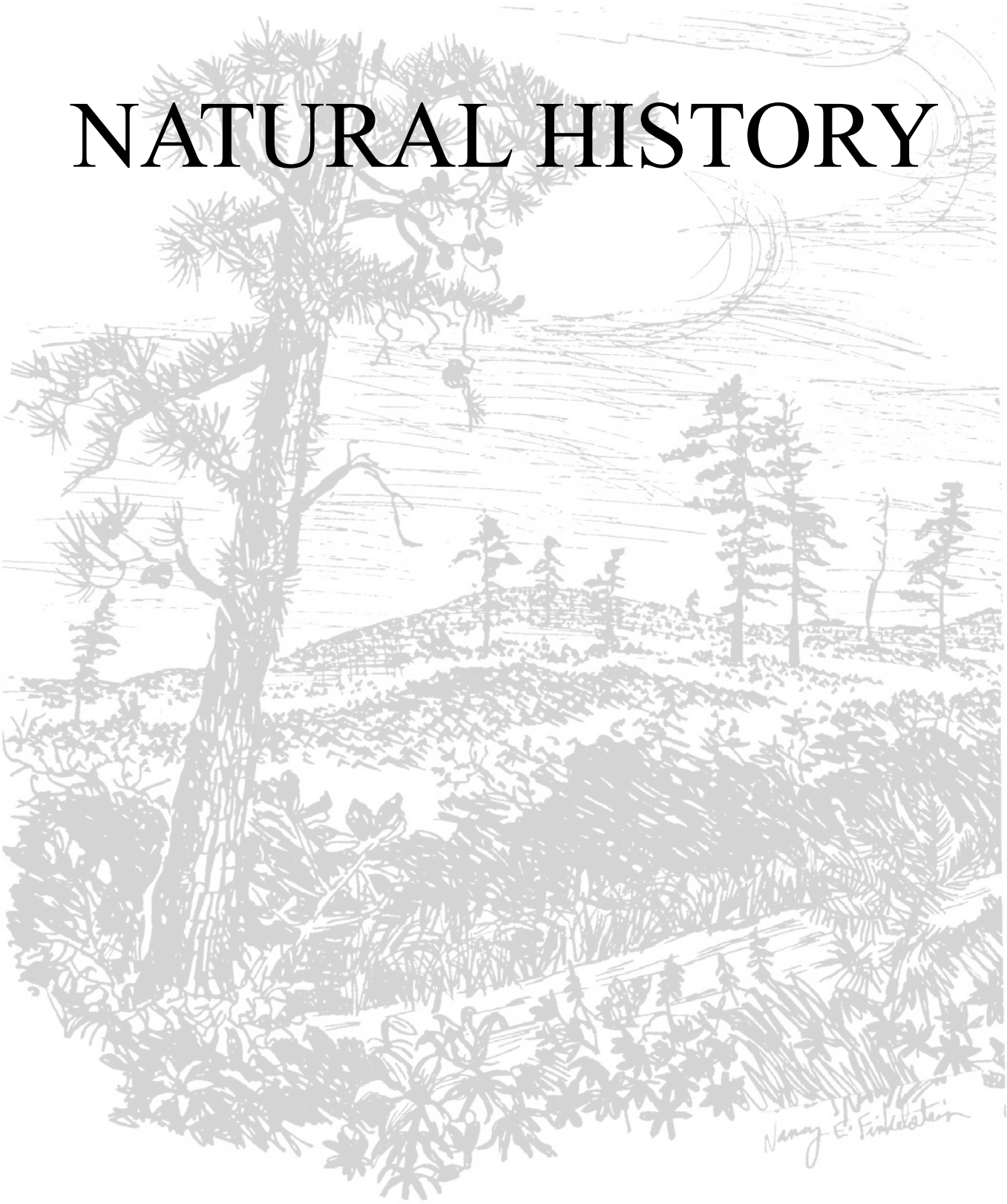
The water table is at or near the surface most of the year. Permeability is rapid.

Gr - Granby Loamy Find Sand

This nearly level soil occupies depressional areas on outwash plains and lake plains. It is also in drainage-ways. Areas are saucer-shaped. Most average 5 to 25 acres in size. A few small, isolated areas are fine sandy loam throughout. Included in this mapping unit are small areas of Junius and Cheektowaga soils.

Figure 22. Soils of the Woodlawn Preserve. USDA Soil Survey.

NATURAL HISTORY



A Natural History
Summary and Vision
For the Woodlawn Preserve,
Schenectady, New York

Male Karner Blue, Woods Hollow, Saratoga Co., New York, 31 May 2003. © 2009 by Robert Dirig.

Prepared by

Robert Dirig

Part I:
Natural History Summary

THE PINE BUSH: As one the oldest cities in New York, and indeed, in the eastern United States, Schenectady (founded 1661) has long influenced the natural landscape in which it grew, especially the famous "Pine Plains" on the southeastern edge of the City. These sandy acres are near the northwestern border of the great Albany-Schenectady Sand Plain. This was laid down as a 40-square-mile sand delta where the Glacio-Mohawk River entered Glacial Lake Albany during the Pleistocene glacial recession. An excellent map of the sand plain's boundaries (and thus the limits of the distinctive vegetation and fauna that developed on it) was published by Don Rittner (1979b) in the journal Skenectada (Volume 1, page 48). It is instructive to see how extensive the sand deposits are in Schenectady, Rotterdam, and Niskayuna [see APPENDIX 1]. The Woodlawn Preserve parcels (in the City of Schenectady, Towns of Rotterdam and Niskayuna in Schenectady County, and on the western edge of the Town of Colonie in Albany County, New York) all lie within this original pine barrens vegetational system, where a few remnants survive.

FLORA: An early list of the wild flora of Schenectady County, authored by E. W. Paige in 1864, contained many plants from the "Pine Plains." This old list complements other historical and ongoing floristic records at the New York State Museum and New York Natural Heritage Program in Albany [e.g., see Steve Young's Combined Woodlawn Plant Species List (2004), APPENDIX 2]. Rittner's award-winning book Pine Bush, Albany's Last Frontier, published in 1976, included the first full compilation of plants of this sand plain on pages 103-166 (incorporating extensive field and herbarium research by Stanley J. Smith and Theodore Baim). Robert Dirig made sustained explorations for Pine Bush plants, bryophytes, and lichens between 1973 and 1985, depositing hundreds of voucher specimens in the Bailey Hortorium Herbarium at Cornell University and some duplicates at the New York State Museum Herbarium in Albany (a few from Schenectady/Rotterdam, but most from Albany County). Janet Mattox studied Pine Bush wetland flora (including Schenectady County) in the early 1990s, documenting many surviving rarities in her master's thesis (Bard College, May 1994). George R. Robinson & Kathleen Moore (2003) compiled a very recent summary of Pine Bush plants.

CRYPTOGAMS: In addition to vascular plants, the bryophytes and fungi were studied by Charles Horton Peck, the first State Botanist at Albany, from the 1860s to the early 1900s. More recent summaries were compiled of Pine Bush fungi by Rittner (1979b), and of Pine Bush bryophytes by Dirig (1986a & b) and Norton Miller & Lori Leonardi (2003). Some Pine Bush lichens were listed by Peck (in his early Reports of the State Botanist), Bruce Milne (1979), and Dirig (1986c, 1990); Dirig has also extensively documented these in the Pine Bush since 1976 (unpublished). The plants and cryptogams of this pine barrens are thus very well known.

ANIMALS: Pine Bush vertebrates are likewise well studied, as summarized in Rittner's (1976) book by Margaret Stewart (herps, pages 189-196), Robert Miller (birds & mammals, pages 171-188), and others. Stewart & John Rossi (1981) refined information on the herps of this sand plain in an elegantly written paper in the American Midland Naturalist a few years later; and Jeff Barnes (2003, details below) updated the lists of vertebrates. APPENDIX 3 provides a list of birds recently observed by Alan Schroeder at Woodlawn. Pine Bush insects and other invertebrates have also been extensively studied by early scientists (State Entomologists Asa Fitch, J. A. Lintner, & E. P. Felt), as well as recent entomologists (e.g., Tim McCabe, John F. Cryan, and Dirig). Early entomological efforts were summarized by Rittner (1979) in Skenectada (Volume 1) on pages 3-35. Pine Bush butterflies are especially well known, starting with a few observed by James Eights in his Naturalist's Every Day Book in 1835. APPENDICES 4 & 5 provide recent summaries of Pine Bush and Schenectady County butterflies and skippers from Dirig's records (1973-present).

GENERAL NOTES: Rittner's Pine Bush: Albany's Last Frontier (1976) remains a classic reference on the area. Jeffrey Barnes published a natural history field guide to the Pine Bush (including Schenectady County) in 2003, which contains an excellent historical and ecological overview in the introduction, with detailed information on about 100 characteristic pine barrens species. Updated checklists of Pine Bush bryophytes, vascular plants, insects, fishes, herps, birds, and mammals, plus a comprehensive literature summary, are provided at the end. These and other sources too numerous to mention provide a fascinating picture of the exciting biotic richness of this sand plain since the beginning of such records. We are fortunate that surviving vegetational remnants still harbor some of the critical pine barrens species within the acres of the Woodlawn Preserve.

THE KARNER BLUE IN SCHENECTADY COUNTY: This butterfly was first carefully documented in 1978 in the Schenectady area by John F. Cryan and Dirig, and in 1979 by Cryan and Bruce Cronemeyer (a DEC employee), as detailed in APPENDIX 6. Thirty years ago, the butterfly was hanging on in habitats that were already under stress, but disappeared from these sites within a few years (Cryan believes they lingered into the early 1990s). Kathleen O'Brien of NYS-DEC reported the last known sighting of Karner Blues in Schenectady County on 16 July 1998 (in her email to R. Dirig of 31 Dec. 2008); this was not on the Woodlawn property or other early sites found by Cryan, Dirig, and Cronemeyer. The historical details in Dirig (1994) and APPENDIX 6 help us to visualize the situations in which the butterfly was found here, and suggest restoration strategies and priorities for reintroducing Karner Blues at Woodlawn, which is one of the goals for this Preserve.

PERSONAL EXPLORATIONS: My explorations of the western Pine Bush in Schenectady County began in 1978, when John F. Cryan and I searched for Karner Blue populations throughout New York State. Part of our field procedure was to describe each site and record its important plants and other biota — a fortunate precaution, judging from their later demise. While living in Albany in 1979, I also explored a utility corridor about 5 miles west of the

Woodlawn area on Sept. 13th, making extensive notes on the flora and lichens, and a few observations of insects that are summarized in APPENDIX 7. This field list gives a good idea of an intact (if fire-suppressed) Schenectady County pine barrens remnant about 30 years ago. There seems to have been surprisingly little careful field work done on the northwestern edge of the Pine Bush delta, probably due to the glamour of the high dunes and their relatively undisturbed acres about 6 miles SE of Schenectady, which have attracted so much attention. The historical glimpses we have of Schenectady-area natural history are valuable today. In early November 2008, I explored the Woodlawn tract with Don Rittner and by myself, compiling lists of the plants and other biota (see APPENDIX 8). We concentrated on the City of Schenectady parcel, but also walked through the Rotterdam section and adjacent areas of Albany County (Colonie).

OTHER RECENT FIELD WORK: Others have provided very recent lists of the plants (Steve Young, APPENDIX 2) and birds (Alan Schroeder, APPENDIX 3) of the Woodlawn area. Staff of Callanan Industries, Inc. (2007) also prepared a comprehensive "Wildlife Management Plan" for the adjacent Cordell Road Facility in Albany County, including brief field lists of the plants, birds, amphibians, reptiles, mammals, insects, fungi, fish, and mollusks.

SUGGESTIONS FOR RESTORATION AND INTERPRETATION AT THE WOODLAWN PRESERVE: With this wealth of detailed baseline information about the Schenectady Pine Bush (and the larger pine barrens system of which it is a part), we can deduce the kinds of vegetation and faunation that existed there historically. Many of the special pine barrens floristic elements are still present around the edges, waiting for a little encouragement to restore themselves (APPENDICES 2, 7, & 8). Pine Bush animals, which are not rooted in place throughout the year, take much more time to find and study; but some significant species are still present, and it is likely that more will be discovered [see Barnes (2003) above, and APPENDICES 3-5]. I believe it is possible to reestablish a functioning pine barrens community at the Woodlawn Preserve, as detailed below.

Don Rittner has indicated a high interest in restoring the Karner Blue at Woodlawn. This endangered butterfly has been very well studied, and there is much local expertise on restoring its habitat and foodplant, and rearing captive butterflies for release (Albany Pine Bush Preserve and New York State Department of Environmental Conservation personnel, and Alan Fiero's Farnsworth Middle School group in Guilderland). Perhaps the greatest encouragement for this idea is the natural occurrence of the butterfly at Woodlawn until the early 1990s (APPENDIX 6). We are also extremely fortunate to have recent successful Karner Blue restorations near the Discovery Center at the Albany Pine Bush Preserve headquarters off Old State Road/New Karner Road (Rt. 155) in Albany County, and at the Woods Hollow Nature Preserve in Saratoga Co., New York The Saratoga site provides an especially valuable model of an analogous situation — a deep, restored sand pit that used to have a pond in the bottom (an important difference is that this site did not lose its Karner Blues). APPENDIX 9 provides historical and recent details on the Woods Hollow site.

Part II.
Details of Trails

The rest of this document offers specific suggestions for seven nature trails, each with major interpretive themes, and for restoration of the Karner Blue Butterfly, its Wild Lupine hostplant, and important adult nectar sources at Woodlawn. Since the Preserve may become a showplace for Karner Blues, and will likely draw people who are generally interested in butterflies from long distances, if this endangered butterfly is reestablished there, restoration of many other Pine Bush butterflies and butterfly plants is also emphasized throughout the Preserve. A map of the Preserve indicating named areas and proposed trail locations is provided in APPENDIX 10.

In the following accounts, plants marked with an asterisk (*) are non-native species that are widely naturalized, mostly from Europe, in this part of New York.

Names included in Richard Mitchell's and Gordon Tucker's (1997) Revised Checklist of New York State Plants are used throughout.

ENTRANCE AREA

Access to the Woodlawn Preserve will be through a gateway on the SW end of Gifford Road. This area is already paved, with space for parking, and two trails begin/end there: a paved trail proceeding straight ahead on the right, then curving to the left, and continuing to a dead-end turn-around near the railroad at the NW corner of Delta Lake (see EXOTIC THICKET TRAIL below); and a sandy lane (the PINE BARRENS TRAIL) that begins on the left, immediately inside the Preserve. A WELCOMING KIOSK on the left, inside the gate, might have a large map of the Preserve, with trails indicated. Checklists of plants, butterflies, birds, and other biota, trail maps, tick information, and Preserve regulations could be picked up by visitors at the kiosk. It might also have space for posting photos of notable plants or butterflies to see this week, and a notebook for visitors to sign and record observations. A wastebasket would be practical in this area if pickup service is available.

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PINE BARRENS TRAIL

(See map of "Woodlawn Areas," Western Pine Bush Map.jpg, separately supplied by Don Rittner; Area 10 = Western Pond Shore)

A NW-to-SE-tending sand trail just inside the Preserve, paralleling a chain-link fence from the Entrance Gate for ca. 1000 feet to the N-central edge of Delta Lake.

MAIN THEMES
Characteristic Upland Plants of the Pine Bush
Pine Bush Butterflies and Skippers
Rare Species (Karner Blue and Wild Lupine)

This trail could be especially oriented toward people with limited time, limited interest, or impaired walking ability, and would offer a good overview of the pine barrens natural community, via frequent interpretive signs and a trail booklet. A rail fence (made of Black Locust logs from Woodlawn) might edge the trail on the right side, on the SE end, where it borders an arm of Delta Lake. Nothing should cover the trail, as bare sand is important in this natural system, especially to butterflies for perching, puddling, and basking, and to Tiger Beetles (Cicindelidae) for hunting (see the recent Tiger Beetle field guide by Pearson et al., 2006).

The NE (left) side of this sand trail abuts a fringe of S- and SW-facing oak woods, with many native plants characteristic of the Pine Bush already rooted in surviving topsoil (in contrast to most of the rest of this tract, which has been sand-mined) [see APPENDIX 11]. The SW (right) side toward Delta Lake has a number of naturalized, non-native herbs, shrubs, and vines growing in disturbed sand, intermixed with native plants. Some of these immigrants are important butterfly nectar sources that complement the natives in an inoffensive way; but a few are so invasive that they should be removed (see below).

Establishment of this trail should require relatively minimal effort — mostly leaving and enhancing what native plants are there, planting masses of Wild Lupine, then trying to reintroduce Karner Blues from the larger population on the E side of Delta Lake.

SPECIFIC RECOMMENDATIONS

Most of the characteristic native Pine Bush plants (APPENDIX 11) are already there, including a few Wild Lupines. They need a little encouragement, perhaps augmented by transplants from elsewhere in the Preserve, or from seed-grown Pine Bush stock. Here is my field list, proceeding from NW to SE, of plants that should remain where they have chosen to grow along this trail:

Common Milkweed
American Dewberry
Grey Birch
Sweetfern
Sweet Everlasting
Little Bluestem
Dwarf Cinquefoil
Bush Clover
*Spotted Knapweed
*Deptford Pink
Scarlet Oak
Smooth Sumac
Common Evening Primrose
Spotted Horsemint
*Queen Anne's Lace
Cottonwood
Canadian Tick Trefoil
*Giant Mullein
Grass-leaved Goldenrod
Black Cherry
Staghorn Sumac
American Hazelnut
Oldfield Goldenrod
Wild Strawberry
*Common Yarrow
Heath Aster
Black-eyed Susan
Black Locust
Switchgrass
Wild Lupine (2 dead stalks)
*?Peppergrass
Common St.-John's-wort
Trembling Aspen
Whorled Loosestrife

Efforts should be made to restore masses of the following characteristic Pine Bush plants in this area: Wild Lupine, Scrub Oak, Pitch Pine, New Jersey Tea, Lavender Beebalm, Spotted Horsemint, Black Huckleberry, Early Low Blueberry, Bracken, Little Bluestem, Butterfly Milkweed, Goat's Rue, Bush Clover, Prairie Willow, Sassafras, and Canadian Tick Trefoil.

The best stands of Little Bluestem that I have seen in the Pine Bush in recent years already occur along this trail. Encouraging this splendid native grass might result in recolonization of this area by the Cobweb Skipper, Dusted Skipper, Indian Skipper, and Leonard's Skipper, which are all relatively rare in New York, and use it as a larval foodplant.

These characteristic Pine Bush cryptogams might also be very easily introduced, providing a unique and subtle dimension to this restoration: Earth Star Fungi, Haircap Moss, Purple Heath Moss, British Soldiers, Pagoda Lichen, and Reindeer Lichens. [I am willing to handle this aspect of the restoration.]

A colony of Karner Blues should be established when the Lupine is restored, so that visitors can see this celebrity butterfly within a few feet of the entrance.

Important naturalized plants already growing in this area that provide nectar for Karner Blues include *Spotted Knapweed and *Common Yarrow. (See APPENDIX 12 for others that may not be evident in November.) Seeding a few "weedy" amaranths and chenopods in disturbed sand on the right side of the trail near the entrance would provide larval plants for the Common Sootywing, another Pine Bush skipper that is uncommon off the coastal plain. Invasive naturalized plants that should be removed from this area include *Garlic Mustard, *Honeysuckles, *Japanese Knotweed (one plant seen, NE side of trail near entrance), *Wormwood, *Oriental Bittersweet, and *Yucca (one plant seen, NE side of trail near entrance).

I noticed evidence of campfires in this area. Although natural fire is an important component of pine barrens systems, here it should be avoided due to the proximity of human

dwellings and the very precious refugium of native Pine Bush plants in the oak woods on the NE side. (The same reasoning applies to the DUNE TRAIL and KARNER BLUE TRAIL environs.)

After ca. 1000 ft., the PINE BARRENS TRAIL continues on the left via a short connector through a shady wooded stretch to another open 750-ft. segment around the NE corner of Delta Lake (see map, area 9 = Northwestern Pond Shore, and area 8 = Northeastern Pond Shore). Where the connector begins, the NORTH MARSH TRAIL branches off on the right, leading down into the Delta Lake basin (see below). When the PINE BARRENS TRAIL resumes at the top of the slope on the northeast corner of Delta Lake, it borders an oak woods, and is a S-facing, sunny, sandy path with these indicator plants already in place: Bush Clover, Spotted Horsemint, Canadian Tick-trefoil, perhaps another Desmodium sp., Little Bluestem, *Spotted Knapweed, Common Milkweed, Dewberry, Chestnut Oak, Red Maple, Witch Hazel, and a large colony of the very beautiful Winged Sumac. (Naturalized *Wild Apple, *Honeysuckles, *Multiflora Rose, *Norway Maple, and *Crabapple are less desirable at this location, and might be removed.) Another mass of Wild Lupine could be planted in this area. At its eastern terminus, the PINE BARRENS TRAIL joins the EAST MARSH TRAIL and DUNE TRAIL (which are characterized later in this report).

Mature trees (mostly oaks and White Pines) grow along the E side of the final 200-foot-long, easternmost section of this trail. A number of them have conspicuous foliose lichen rosettes growing on their trunks. This is the best place in the Preserve to point out and interpret them (via a sign), as an adjunct to restored ground-inhabiting lichens on the NW portion of this trail (see above) and in the Karner Blue area E of the EAST MARSH TRAIL (below).

A Sassafras thicket might be planted here as larval foodplant for the Spicebush Swallowtail and Promethea Moth. This beautiful and interesting small tree has a spicy fragrance, variable mitten-like leaves, and an elegant growth form. American Hazelnut could also be planted along the southernmost end of the trail.

NORTH MARSH TRAIL

(See map, area 9 = Northwestern Pond Shore)

A SW-to-NE-tending trail of ca. 300 ft. through a wetland on the N side of Delta Lake.

MAIN THEMES

Characteristic Wetland Plants of the Pine Bush

Natural Healing in a Highly Disturbed Habitat

Rare Species (Fringed Gentian)

This water body results from deep sand mining, which stripped off the topsoil and probably most of the seed bank. Thus the vegetation that has developed there is an unusual association that would not occur in a pristine wetland — a combination of pioneer native aquatic plants like Broad-leaved Cattail and Common Scouring Rush, naturalized exotics (*Common Reed and *Purple Loosestrife), and more sedentary natives that like soggy substrates (Ditch Stonecrop and Water Purslane). The Trail passes through a fascinating matted marsh that has developed on disturbed sand at the water table interface, and is different from anything else I've seen in the entire Pine Bush. Plants and animals that live there must be able to withstand periodic flooding at times of heavy runoff. It harbors an entirely different array of plants from those of the juxtaposed dry, sandy PINE BARRENS TRAIL, thus providing a striking contrast.

SPECIFIC RECOMMENDATIONS

Because this area is so badly disturbed, it would be interesting and instructive to restore a number of native wetland plants that occur in similar habitats elsewhere in the Pine Bush. These might include Bog Clubmoss, Round-leaved Sundew, Lance-leaved White Violet, Prairie Willows (S. tristis, S. humilis) and Slender Willow (Salix petiolaris), Big Bluestem, Indian Grass, Swamp Milkweed, Blue Vervain, Joe Pye Weeds, Tussock Sedge, Lake Sedge, Blue Flag, Variegated Horsetail, False Nettle, Buttonbush, Highbush Blueberry (near edges of N sand bank), Red-osier Dogwood, Turtlehead, Flat-topped White Aster, and mosses (including Sphagnum compactum and Polytrichum spp.).

The following plants are already present as a foundation for this restoration:

Broad-leaved Cattail
*Common Reed (beginning to spread—should be removed here)
Bulrush (Scirpus ?validus)
Scouring Rush
Willows
*Self-heal
Gerardia (in dense abundance)
Willow-herb
Boneset
Blue Vervain
*Purple Loosestrife (remove)
Speckled Alder
Woolgrass
Ditch Stonecrop
Steeplebush
Fringed Gentian (!)

Pitch Pine (drowned by flooding)	Water Purslane	Juncus sp. (small, matted)
	*Sweet Clover (remove)	

Undoubtedly others are present or will colonize this site as time proceeds.

A surprising and very exciting discovery in this area of Woodlawn was the rare Fringed Gentian, which was still in flower on the NE corner of Delta Lake on 4 November 2008 (a very late bloom record)! This spectacular plant is a biennial, with very fine wind-blown seeds. Small rosettes develop the first season, pass the winter, and produce multiple 2-inch-long, cobalt blue flowers on 18-inch-high plants the next autumn. Thus the plants seem to move around, not always blooming in the same spot every year. This is one of the most magnificent wildflowers of our flora, and if a few plants can be introduced along this trail from the small natural cluster on the NE corner of the Lake, it will be a highlight of the whole Preserve. (Gentians should probably be restored near the northern sand bank, where the soil is still a bit wet, but removed from the possibility of total submersion. Once established, they should seed themselves and find the places they like best.)

Fringed Gentian management has been perfected at Cornell University's Fringed Gentian Natural Area near Ithaca, New York, which is maintained by the Natural Areas Committee. This gentian requires a wet, limy soil with low herbaceous cover, and protection from browsing by White-tailed Deer. Krissy Faust, Wildflower Gardener at the Cornell Plantations (and also an associate of the Albany Pine Bush fire management team), and other members of the Natural Areas Committee, have years of experience.

Figure 23. Fringed Gentians near Ithaca, New York: Left, in full bloom, flowers closed, 21 Sept. 2007. Right, flowers open in bright sunlight, 18 Sept. 2004. © 2009 by Robert Dirig.

managing this lovely wildflower, and would be good sources for advice. Heather Robertson, a former Cornell graduate student whose Ph.D. project focused on this gentian, summarized its biology and conservation in her thesis (Robertson 1992).

The following wetland butterflies will likely colonize the area, if they do not already live there: Least Skipper, Peck's Skipper, Long Dash, Delaware Skipper, Mulberry Wing, Black Dash, Black Swallowtail, Acadian Hairstreak, Summer Azure, Harris' Checkerspot, Pearl Crescent, Baltimore, Questionmark, Eastern Comma, Red Admiral, Mourning Cloak, Viceroy, and Eyed Brown. If Common Buckeyes ever stray to Schenectady, as they have done nearby in recent years, they may lay eggs on the abundant Gerardias, which are a frequent larval foodplant in wet sandy places at Cape May, N. J.

Because of varying water levels, a corduroy path (composed of local Black Locust logs, 2-3 feet long, laid perpendicularly to the path's trajectory) could be installed in the bottom of the basin. This trail will need to be closed when Lake water is high.

Plants and other features should be labeled with small signs.

This special habitat will continue to heal itself over time. It will take more study of existing plants at warmer seasons to produce further specific ideas for floristic restoration and trail development.

The EAST MARSH TRAIL and SOUTH MARSH TRAIL (see below) continue to develop and interpret this wetland habitat along other shores of this water body.

East Marsh Trail

(See map, areas 9 = Northwestern Pond Shore [northern part]
& 11 = Southern Pond Shore [southern part])

A N-to-S-running, 500-ft-long trail on the E side of the Delta Lake basin, from the end of the PINE BARRENS TRAIL and junction of the DUNE TRAIL on the N end to the KARNER BLUE TRAIL (going E) and SOUTH MARSH TRAIL (going W) on the S end.

MAIN THEMES

Characteristic Wetland Plants of the Pine Bush

Wetland Butterflies of the Pine Bush

Rare Species (Fringed Gentian, Karner Blue)

Natural Healing in a Highly Disturbed Habitat

On the N end, this trail abuts the edge of a natural oak woods growing in topsoil; in the restoration, it would top a levee to be constructed on the same level for the rest of its length. The levee will contain high water that periodically accumulates in Delta Lake, and would otherwise flood the Karner Blue restoration between this trail and the KARNER BLUE TRAIL to the E. The elevated portion will look down on the Karner Blue colony on the E and onto a restored flowery marsh on the W that fills the basin with plants to the shores of the Lake. Please see details of the SOUTH MARSH TRAIL (below) for specifics of the marsh restoration on the E and SW sides of the Lake.

SPECIFIC RECOMMENDATIONS

A levee, triangular in cross-section, with a flattened top for the trail base, should be constructed of as much sand as possible, with 45-degree-slanted sides. These can be planted with low shrubs and herbs that will stabilize the sand and spread to provide color and interest. On the Lake side, showy flowers of wetland affinity that need less moisture might be emphasized on the levee flank, including Flat-topped White Aster, Grass-leaved Goldenrod, Black-eyed Susan, Gerardia, Joe Pye Weed, Boneset, Swamp Milkweed, and Blue Vervain, as well as scattered shrubs of Highbush Blueberry. [On the E (Karner Blue) side, plants should be those that serve as larval hosts and nectar sources for the celebrity Blue and other sand barrens butterflies (see details under KARNER BLUE TRAIL, below).]

South Marsh Trail

(See map, area 11= Southern Pond Shore, in part)

This trail runs W-to-NW for ca. 1350 feet along the S and SW edges of Delta Lake (the eastern section on a levee), then connects to the EXOTIC THICKET TRAIL on the NW end.

MAIN THEMES

Characteristic Wetland Plants of the Pine Bush

Wetland Butterflies of the Pine Bush

Natural Healing in a Highly Disturbed Habitat

This part of the lakeshore is badly disturbed, and not the original surface of the sand, as in the area through which the NORTH MARSH TRAIL passes. The E and SW sides of the Lake are more open than the N fringe, with footpaths and extensive ORV (off road vehicle) damage. This shoreline also floods periodically, as elsewhere, and may need to be closed when Lake waters are high. An extensive fen-like marsh might be established in this area. Plants now present (in autumn) on the E and SW sides of the Lake are listed below (others will likely show themselves in spring and summer):

Alder: small shrub.
*Red Clover: leaves at edge of Lake.
*Forget-me-not: rosettes at edge of Lake.
Mints (Lycopus sp.): on the shore.
Sedges: on the shore.
Marsh Fern: S shore.
Royal Fern: S shore.
Gerardia: solid masses on damp disturbed sand!
Rush (Juncus sp.): carpets throughout.
Scouring Rush.
Cottonwood.
*Queen Anne's Lace.
*Sweet Clover.
*Giant Mullein: rosettes & old seed stalks.
Common Evening Primrose.
Swamp Milkweed.
Grass-leaved Goldenrod.
Boneset.
Black-eyed Susan.
Heath Aster.
Blue Vervain.
Willow (Salix cf. petiolaris?).
*Dwarf/Siberian Elm: small tree.
Silver Maple.

SPECIFIC RECOMMENDATIONS

Because this area is more extensive than the NORTH MARSH TRAIL, there is larger scope for a marsh restoration, using the same plants mentioned above under that trail's characterization. Once they gain a foothold, the plants should rapidly reproduce themselves to fill the space.

Fringed Gentians should also be established on these sides of the Lake, especially in areas less likely to be submerged during rises in the water table.

Closer to the Lake shore, Buttonbush and Leatherleaf (which like their roots in a few inches of water), Turtlehead, Willows, Red-osier Dogwood, Blue Flag, Bog Clubmoss, Round-leaved Sundew, Lance-leaved White Violet, Slender Willow (Salix petiolaris), Indian Grass, Swamp Milkweed, Blue Vervain, Joe Pye Weeds, Tussock Sedge, Lake Sedge, Variegated Horsetail, False Nettle, and Flat-topped White Aster might be emphasized. Additional natural plants should quickly colonize this area, once started and given some protection.

White-tailed Deer browsing and Beaver activity will need to be excluded here. Canada Geese will also need to be discouraged or they will strip the shore of herbage.

Some naturalizing plant species will likewise need to be contained: *Common Reed, *Purple Loosestrife, *Wormwood, *Honeysuckles, and anything else that proves to be too aggressive.

Addition of a Northern Prickly Ash clump on the SW side may attract foraging female Giant Swallowtails. These huge, magnificent southern butterflies have been dispersing throughout eastern and central New York in recent years, and lay eggs on this native shrub. There are historical records of the butterfly from the Pine Bush (APPENDIX 4). It would be wonderful to have Giant Swallowtails in the Woodlawn Preserve, and the foodplant would provide a welcome mat. The plant is interesting in itself, as a native, northern close relative of citrus, and the source of a natural toothache remedy. It occurs in the Woodlawn area (APPENDIX 2).

Restoring Pitch Pine, Scrub Oak, and Dwarf Chestnut Oak along the SW side of this trail would provide a sheltering windbreak and buffer between the railway corridor, as well as a showcase for these stalwarts of the Pine Bush flora.

An existing footpath close to the lakeshore could be stabilized with a “corduroy” of 18-inch-wide Black Locust logs, laid perpendicularly to the path’s course, as in the NORTH MARSH TRAIL.

Eastern Bluebird and Tree Swallow nest boxes might be added around the Lake to attract these beautiful birds to the area. Belted Kingfishers fly over Delta Lake. They likely nest in burrows in the abundant sand banks of the region. A Great Blue Heron was reported there by another observer in early November 2008.

Karner Blue Trail

(See map, area 11 = Southern Pond Shore [part])

An E-, then N-running, 1350-ft.-long trail passing through restored Karner Blue habitat in the Sandy Bowl at the base of the Eastern and Western Dune summits. (The E-W portion occupies the top of a levee.)

MAIN THEMES

Characteristic Upland (Dune) Plants of the Pine Bush

Rare Species (Karner Blue, Wild Lupine, etc.)

Pine Bush Butterflies and Skippers

At other sites throughout its range, Karner Blues thrive in sandy, S- and SW-facing situations that are baked by the sun and sheltered by exposure and an undulating topography. Here Wild Lupine can mass in large clumps, interspersed with flowers that feed the butterflies of both broods. Damp sand is also often present for puddling (ingesting salts and minerals from damps soil) in many Karner Blue habitats.

The Sandy Bowl (open sandy areas and remnants of dune bases) on the E side of Delta Lake is the best place in the Preserve to attempt a large-scale Karner Blue restoration. The Sandy Bowl is a S- and SW-facing, sunny, sloped, sheltered arena like natural KB colonies. Although very badly degraded and eroded by sand mining and ORV trails, this area has many important pine barrens plants still lingering in undisturbed enclaves on the dune summits, under islands of trees still rooted in topsoil, and along the edges of the DUNE TRAIL on the N and E sides of the Bowl (see next section, and APPENDICES 8 & 11). An original Karner Blue colony occurred here in the 1970s ff. (APPENDIX 6). Many other important (and some rare) pine barrens butterflies often occur with Karner Blues in the Pine Bush, and should find their way to this area if the habitat can be restored. The lowest parts of this area may be damp, especially after rains, providing opportunities for puddling.

On the W edge, the levee topped by the EAST MARSH TRAIL should protect the Sandy Bowl from inundation when Delta Lake's waters are high, will also shelter the area, and will provide a convenient viewing platform for the Karner Blue colony on the E.

Because this restoration involves a butterfly classified as Endangered on both the State and Federal levels, it will be necessary to consult with NYS-DEC and Federal officials about plans for restoring it at Woodlawn, and to obtain the appropriate permits. There is a great deal of local expertise on managing this butterfly and growing it in captivity for release (see introductory section). But before anything can happen with the butterfly, the habitat must be improved.

SPECIFIC RECOMMENDATIONS

The first necessity, of course, is filling the Bowl with Wild Lupine, which, once it is re-established, should freely seed itself throughout, massing in large clumps. (The plant itself is gorgeous and interesting.) People associated with the Albany Pine Bush Preserve, DEC, and Guilderland teacher Alan Fiero's program all know how to do this.

Figure 24. Wild Lupine in full glory at Woods Hollow, Saratoga Co., New York, 30 May 2003. © 2009 by Robert Dirig.

The next priority should be establishing nectar plants for the butterflies that bloom during their spring (May 20th–June 20th) and summer (July 15th-Aug 7th) flights. Especially important Karner Blue nectar plants in this region (summarized in APPENDIX 12) include American Dewberry, Black Huckleberry, Lowbush Blueberry, Wild Strawberry, Sand Cherry, Cinquefoils, and Wild Lupine early in the spring flight; with *Yellow Hawkweed, *Maiden Pink, *Birdsfoot Trefoil, *Oxeye Daisy, *Red Clover, Spreading Dogbane, New Jersey Tea, and Common Milkweed on the later end. The July brood uses Lesser Daisy Fleabane, *Common Yarrow, *White Sweet Clover, *Hoary Alyssum, *Bouncing Bet, and especially Spotted Horsemint, Butterfly Milkweed, and *Spotted Knapweed for nectar. A few more flowers are listed in APPENDIX 12, and others may be known to DEC and Albany Pine Bush Preserve personnel. Like most butterflies, Karner Blues are opportunistic feeders at nectar sources that are available when

they are flying. Thus additional plants may prove to be important nectar sources as the restoration proceeds.

Figure 25. Karner Blues nectaring at Butterfly Milkweed, a major nectar source, Woods Hollow, Saratoga Co., New York, 10 July 2005. © 2009 by Robert Dirig.

On the drier slopes of the Bowl, including the E slope of the EAST MARSH TRAIL's levee, many of the native woody and herbaceous plants characteristic of the Pine Bush high dunes should be established in large intermixed masses, including American Dewberry, Little Bluestem, Black Huckleberry, Bracken Fern, Bush Clover, Canadian Tick Trefoil, Early Sweet Blueberry, Lowbush Blueberry, New Jersey Tea, Lavender Beebalm, sapling Pitch Pines, Spotted Horsemint, Butterfly Milkweed, Wood Lily, Sweetfern, Switchgrass, and Whorled Loosestrife. Many of these are already present around the Sandy Bowl and upslope at Woodlawn (see APPENDIX 11). As in the PINE BARRENS TRAIL, it would be nice to restore a few lichens, mosses, and the trademark Earthstar Fungus (Astraeus hygrometricus) in this area as well (see above for list).

An important adjunct to the Karner Blue life cycle is the ants that attend the larvae. They are believed to discourage larval parasitoids and predators, and as many as twenty species (!) may be present in Karner Blue colonies (See Savignano 1990). The subtle dynamics of their presence or absence may affect the success of a Karner Blue restoration. DEC officials, persons involved with Karner Blue conservation in NH, OH, WI, MN, and Ontario, and Dolores Savignano herself, may have some insights.

The lowest areas in the Sandy Bowl should be planted with species that we find naturally arranging themselves in the "interdune swales" of the Albany Pine Bush, in the dips between the highest dunes: Prairie Willows (Salix tristis, S. humilis), Big Bluestem, Indian Grass, Sand Cherry, Sand Violet, Birdsfoot Violet, Spagnum compactum, and Dwarf Chestnut Oak among them. If Round-leaved Sundews are restored around the edges of the lowest areas of the Bowl at Woodlawn, we might again watch Karner Blues placidly nectaring at the flowers, which bloom a

few inches above the treacherous leaves of this insectivorous plant — as it did at the Woods Hollow Nature Preserve in Saratoga County in a similar situation in the 1970s!

Edges of the Bowl could be restored with Scrub Oak & Dwarf Chestnut Oak; but if they fill the Bowl, they may crowd out the Lupines, Blues, and other butterflies. An advantage of having these dwarf oaks restored at Woodlawn — in addition to their oddity, beauty, and interest as Pine Bush indicators — is their role as the Buck Moth's (Hemileuca maia) larval hosts. Scrub Oak also feeds Edwards' Hairstreak, another characteristic barrens butterfly that is abundant elsewhere in the Pine Bush.

Restoring masses of New Jersey Tea will provide nectar for several hairstreaks. It is also the larval foodplant of the Mottled Duskywing, one of the rarest skippers in the Northeast, which still persists at the Pine Bush.

Butterfly Milkweed and Spotted Horsemint are lovely midsummer wildflowers that double as important nectar plants.

A few small Black Cherries would provide foodplants for Coral Hairstreaks, which are common here, but not easy to see in most places.

A few Pitch Pine saplings in the Bowl would encourage Eastern Pine Elfins; the two small blueberries would feed Brown Elfins; and abundant Wild Lupine would invite Frosted Elfins and Wild Indigo Duskywings to the Bowl. (Pitch Pines should not be allowed to grow over the Bowl, as their shade would change the habitat.)

A good growth of Little Bluestem in the Bowl might support Cobweb Skippers, Dusted Skippers, and perhaps Indian Skippers and Leonard's Skippers, as along the PINE BARRENS TRAIL.

Once the habitat is revegetated, the Karner Blue will have the best chance of re-establishing itself there.

This section of the Preserve will require the most time and effort to restore, but in time, the Sandy Bowl would become the centerpiece of the Preserve. It takes hikers awhile to get there, so anticipation builds; exposes visitors to many outdoor wonders along the way; and its distance from the Preserve entrance will lose people who are not really interested in all the subtleties of this fragile system.

A deer exclosure fence will be vital in this area, to prevent over-browsing of Wild Lupine, Wood Lily, New Jersey Tea, and other key plants. Lower parts of the fence should exclude woodchucks and rabbits, which also browse Lupine.

An esthetic rail fence (made of local Black Locust logs) could edge the N and W sides of the KARNER BLUE TRAIL, the E side of the EAST MARSH TRAIL at the top of the levee, and the S side of the DUNE TRAIL, to discourage pedestrians from trampling the fragile Karner Blue restoration area in the Bowl.

This area needs an immediate cessation of all ORV traffic! Erosion of the dunes is already at a critical level, and must stop, especially upslope near the dune summits (see the DUNE TRAIL, below).

Figure 26. Wild Lupines, Little Bluestem, and other pine barrens plants at the Woods Hollow Nature Preserve, Saratoga Co., New York, an abandoned sand pit where Karner Blues also persist, 30 May 2003.

New York's endangered Karner Blue Butterfly. Photo by Alan Schroeder.

Dune Trail

(See map, areas 6-7 = Western-Eastern Dune)

A sand trail curving from E to S to W over its ca. 2000-ft. extent, joining the PINE BARRENS TRAIL and EAST MARSH TRAIL interface on its westernmost point, and eventually merging with the KARNER BLUE TRAIL on the S.

MAIN THEMES

Characteristic Upland (Dune & Oak Woods) Plants of the Pine Bush

Rare Species (Karner Blue, Wild Lupine, etc.)

Pine Bush Butterflies and Skippers

This trail is the most remote in the Preserve, but traverses the best pine barrens remnants in the tract. The summits of two high dunes on the NE end are fire-suppressed, overgrown with trees, and badly degraded from ORV traffic — but their vital pine barrens elements, though much abused, still hang on. I was surprised and delighted to find a large Cecropia Moth cocoon on a Scrub Oak on the "Western Dune" summit!

The wooded summits of the "Eastern Dune" and "Western Dune" have a rich assemblage of native Pine Bush plants on original topsoil (where it has not been eroded away by ORVs). This precious refugium should provide seeds that will naturally disperse into the Dune Bowl as natural recovery proceeds. Species present include:

Spotted Horsemint.
Little Bluestem.
Sweetfern.
Bush Clover.
Canadian Tick Trefoil.
Scouring Rush.
Red-osier Dogwood.
Scrub Oak.
Wild Lupine (viz. Don Rittner, 2006-2007).
Trembling Aspen.
*Spotted Knapweed.
New Jersey Tea.
*Honeysuckle.
Witch Hazel.
Poison Ivy.
Bracken Fern.
Grey Dogwood.
White Pine.
Pipsissewa: numerous rosettes of the beautiful leaves inside the woods! Not often seen in such abundance in the Pine Bush.
Wild Strawberry.
Lowbush Blueberry.
American Dewberry.
*Oriental Bittersweet: remove!
*Garlic Mustard: remove!
*Queen Anne's Lace.
Black Locust.
Silverrod: a nice ecotonal species in its natural state.
Staghorn Sumac.
Box Elder.
Blue Wood Aster: a very nice species.
Cottonwood.
Big-toothed Aspen.
Common Milkweed.
Wild Grape.
Sand Violet.
Early Sweet Blueberry.

Cryptogams:
Powderhorn Lichen (Cladonia coniocraea group).
Goblet Lichen (Cladonia pyxidata group).
Alternating Dog Lichen (Peltigera didactyla).
Dog Lichen (Peltigera canina).
Mosses: on shaded slopes of dune summit.

Beyond the dune summits, the trail loops SE-to-SW through an open oak woods on the highest sand ridge (geological origin uncertain; dune, drumlin, esker?), then slowly descends, continuing westward. The E slope of this formation is very steep, dropping to a wooded wetland that shelters the Lisha Kill headwaters at its base (see map, 14 = Northwestern Swamp & 15 = Northeastern Swamp). This oak woodland is an important buffer between the Sandy Bowl and Dune summits and human-occupied areas to the E.

SPECIFIC RECOMMENDATIONS

The eastern curved portion of the DUNE TRAIL has conspicuous lichens on the tree trunks that could be indicated by a sign. This part of the trail might better serve as an area for quiet strolling and contemplation than heavy-duty interpretation. Thickets of Sassafras and American Hazelnut could be added here. The following plants were noticed (Bluecurls is the most important find here; can it be seeded in the Sandy Bowl and along the PINE BARRENS TRAIL?):

Chestnut Oak: trees.
Red Oak: trees.
Oaks [other tree species].
Black Cherry.
Grey Birch.
Maple-leaved Viburnum: small shrub.
Paper Birch.
Whorled Loosestrife.
Bluecurls: in a sandy opening.
*Self-heal.
*Japanese Barberry: remove!
Bottlebrush Grass.

Winged Pigweed and Winged Sumac might be established on the S side of this trail just E of its merging with the KARNER BLUE TRAIL. The former is an herbaceous tumbleweed that has novelty and interest. Winged Sumac is a larval host of the Red-banded Hairstreak, which is slowly extending its range northward. It may reach the Pine Bush shortly, and a thicket of its special plant would welcome it here. (A few plants could be moved, or seeded, from the clump on the eastern section of the PINE BARRENS TRAIL.)

The dune summits must be carefully handled, as they are so important. They are heavily shaded by the trees that saved them — and probably shaded out the Lupines and Karner Blues! Removing a few tree oaks and the Big-toothed and Trembling Aspens, Cottonwood, and Box Elder, might be a good idea, to open up the summit. If Wild Lupine can be restored in masses here, Karner Blues might return. Great care will need to be taken with any further disturbances,

as deeply eroded troughs like those from the ORVs will take many years to stabilize and recover, continuing to erode in the interim. (This illustrates the fragility of the dunes and their vulnerability to even one ORV pass.) Albany Pine Bush Preserve personnel may be able to offer advice, based on attempts to restore similar damage to the highest dunes of that preserve.

Pipsissewa is a gorgeous plant, one of the Pine Bush's nicest species, with pretty whorls of shiny evergreen foliage and pink flower spikes. It occurs in abundance on the "Western Dune." A few plants might be moved (or seeded) along the N side of the PINE BARRENS TRAIL from this source. In any event, it should be given every safeguard here.

The DUNE TRAIL is joined by another steep sand track near the summit of the "Western Dune." This area is also badly eroding, and will need to be stabilized (or closed).

*Garlic Mustard, *Oriental Bittersweet, and *Japanese Barberry should be removed in this area.

The same pine barrens species used to restore the Sandy Bowl should be continued up the slopes to the dune summits in this area. Specific guidelines for this area can be developed after further careful study of the existing situation.

Establishing some chenopods and amaranths on the edges of the KARNER BLUE TRAIL S of the Sandy Bowl would encourage the presence of the Common Sootywing, one of the Pine Bush's rarer small skippers.

Exotic Thicket Trail

(See map, are 10 = Western Pond Shore)

A NW-to-SE-running paved lane of ca. 1000 ft. from the Preserve Entrance to a turn-around near the railroad, on the SW side of Delta Lake's western arm.

MAIN THEME

Natural Healing in a Highly Disturbed Habitat

A major corollary of urban living is disruption and loss of native landscapes and habitats. In time, these heavily disturbed areas restore themselves, after a fashion. Non-native plants that are well adapted as pioneer colonizers often predominate is such situations, and if they are woody, they may remain a long time. They are a sort of natural scar tissue that covers the raw land with a new mantle of green. Many of these plants are beautiful, have interesting stories, and perform an important function.

Woodlawn has its share of naturalized exotic plants. As they are especially prominent around the Entrance area and along this trail, I propose embracing an educative opportunity by celebrating their good points in an area where it would probably be impossible (and perhaps even undesirable) to remove them.

Woody plants in this corner of the Preserve constitute an important buffer between the railroad corridor and the PINE BARRENS TRAIL on the NE and SOUTH MARSH TRAIL on the SE. The thickets of naturalized exotic trees, shrubs, and vines provide shelter, shade, food, and nesting sites for birds; also, perhaps, for some mammals and herps, and many invertebrates.

An example is the *Oriental Bittersweet, a long-trailing woody vine with bright orange fruits that persist in the winter, lending welcome color to the landscape. Only female plants bear the fruits — a concept outside of many people's awareness that also applies to native Staghorn, Smooth, and Winged Sumacs in the Preserve. Although this Bittersweet can be invasive (it also was seen along the PINE BARRENS TRAIL and DUNE TRAIL), having a vine or two here will not hurt anything. It also can be used to explain that there is a similar native species, American Bittersweet, that is a scarce protected plant with larger terminal clusters of scarlet fruits.

Another exotic plant that grows in the northwestern end of Delta Lake (and must be rigorously excluded from the rest of the basin) is *Common Reed, a huge invasive grass with fluffy wind-borne seeds that grows in limy wetlands, also spreading by fast-growing rhizomes. It is apparently introduced from Europe (a native form occurs in fens elsewhere in the Northeast), and is most common in salt marshes and estuaries along the Atlantic Coast. It has moved inland, perhaps vectored by automobile radiators, and thrives in ditches that have accumulated salt from winter snow control. A native butterfly, the Broad-winged Skipper, has

followed it inland from the Coast, arriving on the Albany County landfill by 1998. This plant has been intensively studied in the Hudson valley, and has an interesting ecology.

Introduced *Honeysuckes, *Siberian Elms, and other exotics have their own stories of this sort. Here I merely suggest the concept of a trail treating these organisms as interesting residents, with the understanding that many of them must be rigorously disciplined to remain in this area of the Preserve! Further details can be defined later. This trail will be the easiest to develop, as most of the plants are already there, and it is already paved.

This trail abuts the railroad corridor. The following section offers a few notes on this area, which should not be part of the Woodlawn trail system, but influences it in important ways, especially the EXOTIC THICKET TRAIL & SOUTH MARSH TRAIL.

RAILROAD CORRIDOR

(not a trail)
(See map; abutting areas 10, 11, 12, 17, and 18)

The railroad corridor is potentially very dangerous because of the frequent swift trains. It is not appropriate for trails, pedestrian crossings, or children. Areas on the SW side of the tracks (in Albany County) are probably best used primarily for research, later exploration, and as buffer zones.

A railroad can introduce weeds from outside a region, which first grow in masses along its corridor, and then spread into adjacent tracts. Such areas typically exhibit extensive tangles of exotic plants. *Wormwood is a good example at Woodlawn.

Although convenient, using herbicides to control these plants may also kill rare native plants and affect associated insects and other plants and animals that grow in natural areas abutting the tracks.

These plants were recorded on the NE side of the railroad in November 2008:

Royal Fern.
*Soapwort.
Grey Dogwood.
Horseweed.
Scouring Rush.
*Wormwood.
White Snakeroot: in shade.
*Common Reed.
*Honeysuckles.
Little Bluestem: here & there along RR.
Pitch Pine: a few small trees (and one larger tree) on NE side of RR opposite Callanan Industries' pond adjacent to tracks. Only living ones seen in the whole acreage.
White Pines.
Poison Ivy: huge many-armed vines growing up a large Cottonwood.
*Crabapple: naturalized.
*Dwarf/Siberian Elm (Ulmus pumila): small sapling.
Black-eyed Susan: a number of dead stalks, one still with an open flowerhead!
[Winged Pigweed: a tumbleweed on sandy slope of Callanan Pond, SW side of tracks.]

Part III:
General Notes

The above sections of this report detail an original vision for a comprehensive Woodlawn Preserve habitat restoration and trail system that will be relatively easy to achieve and least disruptive to the natural systems that presently occur there. The concepts may need to be modified as they are put into practice. It will take some time (perhaps five years) to realize these, and new inspirations may come along the way. Some practicalities may also arise that need to be addressed later. A few overall suggestions are offered below.

On our initial exploration, Don Rittner and I sighed with relief when we stepped off the asphalt turn-around at the end of the EXOTIC THICKET TRAIL onto the sand of the SOUTH MARSH TRAIL. A sandy substrate is so much more gentle and friendly, and packed sand is easier to walk on than a beach. Thus we would prefer to maintain the sand trails, except for the entrance area and EXOTIC THICKET TRAIL, which are already paved. If it is necessary to add a surface, wood chips might do along one edge of a sand trail; but the sand surface itself is important for butterflies, tiger beetles, and other insects, as well as plants that require seed-scoring, and it should not be completely covered.

As trails are developed, having appropriate signage throughout and a trail booklet will be necessary. Local lists of birds, butterflies, plants, and other natural features will enhance the field experience of many users. [I am willing to develop these as the restoration proceeds.]

Natural enclaves in urban settings benefit from buffers around their edges. At Woodlawn, it seems best to limit public trails to the system outlined in this report, with the woodlands on the northeastern and eastern sections of the City of Schenectady, Town of Niskayuna, and Town of Colonie parcels NE of the railroad retained as buffers between the Karner Blue restoration and human-occupied areas. Towns of Colonie and Rotterdam areas SW of the railway should also serve as buffers to the restoration and trail system.

The levee on which the EAST MARSH TRAIL and adjacent portions of the KARNER BLUE TRAIL and SOUTH MARSH TRAIL run will be the only major construction in the restoration. Perhaps a base of concrete or railroad ties (or Black Locust logs?) could be laid, then sand moved to build a 45-degree slope on each side. If the top needs to be stabilized to prevent blowing, it could be paved or covered with wood chips in this area only. An engineer will need to define the specifics. The levee should be perhaps 15-20 feet tall at the N end, at the same level as the sandy trail to the N, and curving around on the S side to meet the original level of the soil line, and thus prevent flooding around the edges. The Karner Blue restoration will not work if their habitat is flooded periodically. This feature will be a key to the success of this goal. See the map (APPENDIX 10) for placement.

APPENDICES 2-5, 7-8, and 11 summarize existing baseline information on the flora, butterflies, birds, and other natural elements of the Preserve; while APPENDICES 6, 9, and 12 present details about local Karner Blue habitats. APPENDIX 13 lists butterflies we should be able to restore, paired with the specific plants they require as larval hosts, and habitat indications.

We will need to be careful of wild animals that can become nuisances in preserves of this sort: Beavers, Canada Geese, White-tailed Deer, Woodchucks, and Cottontail Rabbits. Deer exclosure fences should be installed around the Karner Blue restorations to prevent browsing of restored shrubs and herbs, especially Wild Lupine — on the PINE BARRENS TRAIL, KARNER BLUE TRAIL (Sandy Bowl), and DUNE TRAIL (see map, APPENDIX 10). Prior Beaver damage is evident on the S sides of the Lake. This Preserve is not appropriate for dog walking or equestrian traffic, but should function as a quiet pedestrian enclave.

The following non-native plants can be very invasive or otherwise are noxious, and should be removed where found in the Preserve: *Common Reed, *Purple Loosestrife, *Japanese Knotweed, *Oriental Bittersweet, *Wormwood, *Honeysuckles, *Garlic Mustard, *Yucca, and *Japanese Barberry. Some naturalized species can be accommodated because they are important nectar sources for butterflies (detailed above and in APPENDIX 12). Black Locust can be a problem in the Pine Bush, by cloning and shading out the special Pine Bush flora. This tree is native in eastern North America, but not this far north. Any that need to be cut at Woodlawn could be recycled into "corduroy" trails through the marsh, and rail fences in the uplands. A few seedling should be left for larvae of the Silver-spotted Skipper, our largest and most dramatic skipper in the Pine Bush. [Poplars likewise can overmaster the Pine Bush flora, and have been a problem in the Albany Preserve. A few saplings should be left at Woodlawn as potential larval plants for Viceroys and Mourning Cloaks.]

Periodic flooding of the Delta Lake basin likely results from inadequate drainage from the NW corner via an outlet that passes under the railroad into a canal that drains into the Lisha Kill. If this can be improved, occasional high waters might be minimized.

Spraying insecticides for mosquito control would impose great danger to the Karner Blue and other insects. This may produce a conflict with neighbors if mosquitoes become a local nuisance because of the Lake.

Because the Karner Blue is an Endangered Species at the New York State and Federal levels, all permitting regulations will need to be satisfied; likewise any laws regarding protected native plants in New York; and wetland-related issues.

Several trails may be wheelchair-accessible: The EXOTIC THICKET TRAIL, PINE BARRENS TRAIL, EASTERN MARSH TRAIL, and KARNER BLUE TRAIL. Generally, no other motorized vehicles or bicycles should be allowed in the Preserve, except for levee/fence/trail construction, or in emergencies.

Such a huge restoration project will require much local networking, cooperation of regional agencies and state and federal officials, and recruitment of many people to help. A volunteer coordinator and ranger-interpreter may need to be recruited as the restoration proceeds; and local law enforcement personnel will need to help monitor and exclude ORVs and other inappropriate uses of the area. There is much local expertise on how to do all of this.

Part IV.
Summary

This document provides a natural history summary and vision for the Woodlawn Preserve, a large tract composed of several land parcels in the City of Schenectady and Towns of Rotterdam and Niskayuna in Schenectady County, and the Town of Colonie in Albany County, New York. These acres all lie near the western edge of a huge sand delta, which was deposited by the Glacio-Mohawk River where it entered Glacial Lake Albany during the Pleistocene. A distinctive flora and fauna later developed on the large dunes and lowlands of this sand plain, which is now known as the Pine Bush. Its "pine barrens" biota has been thoroughly studied by many natural scientists since 1835, and is very well known. Abundant historical and recent literature attests to the surprising richness of the natural life forms that have been found here. Many individuals and organizations have helped to preserve over 3000 acres in the central and eastern part of the tract. The Woodlawn Preserve now complements these near its western edge.

The most accessible parcel of the Woodlawn Preserve lies in the City of Schenectady, with an entrance at the end of Gifford Road. The southern third of this tract was extensively mined for sand, and has been used for hiking and riding ORVs in recent years. The sand-mined basin is occupied by Delta Lake, a large water body that dominates the southern area near the railroad. Remnants of two high dunes survive east of the Lake. A 2008 inventory revealed subtle refugia of the special pine barrens flora still intact on topsoil around the edges of the basin.

Due to drastic habitat alterations during sand mining (which included removal of the topsoil and part of the seed bank), combined with severe erosion from ORV traffic in recent years, much of the Preserve will need extensive restoration. We are fortunate that many of the special plants that characterize the Pine Bush, and provide the basic structure of natural habitats, are still present around the edges of these former disturbances. They will provide a seed source to begin the restoration, but may need to be augmented by moving more plants from other parts of the Pine Bush, and growing seedlings from local sources for transplanting at Woodlawn. These efforts will be needed to restore and enhance the pine barrens and marsh flora throughout. Establishing a large population of Wild Lupine for Karner Blues, and many other special Pine Bush plants for other local butterflies, will be major emphases. Fringed Gentians, an uncommon, spectacular wildflower, will be encouraged to spread around the Lake, where it already occurs; and a few sand-loving lichens and mosses will be introduced in drier areas. An initial focus on pine barrens and marsh vegetation and Karner Blues and other butterflies may expand to include birds and other animals as the restoration proceeds. The land will eventually heal itself if we are willing to lend a hand and wait.

Several interpretive themes suggest themselves for a continuous loop of seven trails. The PINE BARRENS TRAIL, KARNER BLUE TRAIL, and DUNE TRAIL will emphasize the characteristic plants and animals of this unique inland pine barrens; the NORTH, EAST, and SOUTH MARSH TRAILS spotlight wetland plants, birds, and butterflies; and the EXOTIC THICKET TRAIL nods to widely naturalized foreign plants that have accommodated themselves as wildlife shelter and

buffers in this sandy enclave in upstate New York. Trails will be marked with interpretive signs throughout, and the loop begins at a welcoming kiosk, with trail maps, a trail booklet, plant, butterfly, and bird checklists, and other information on the area.

The easiest trails to restore will be the PINE BARRENS TRAIL and EXOTIC THICKET TRAIL; the three MARSH TRAILS will require more effort; while the DUNE TRAIL and KARNER BLUE TRAIL will be most challenging. Constructing a levee to prevent flooding of the Karner Blue site during episodes of high water will be the most extensive landform alteration, and the most vital part of the restoration. Black Locusts removed from the area could be recycled as corduroy trails in the marsh and rail fences in drier areas.

This project will require the cooperation of many organizations, an army of volunteers, and extensive fund-raising. With charismatic leadership already in place, Woodlawn should soon become a beautiful preserve of restored pine barrens, rare butterflies, and fascinating wild plants.

Part V.
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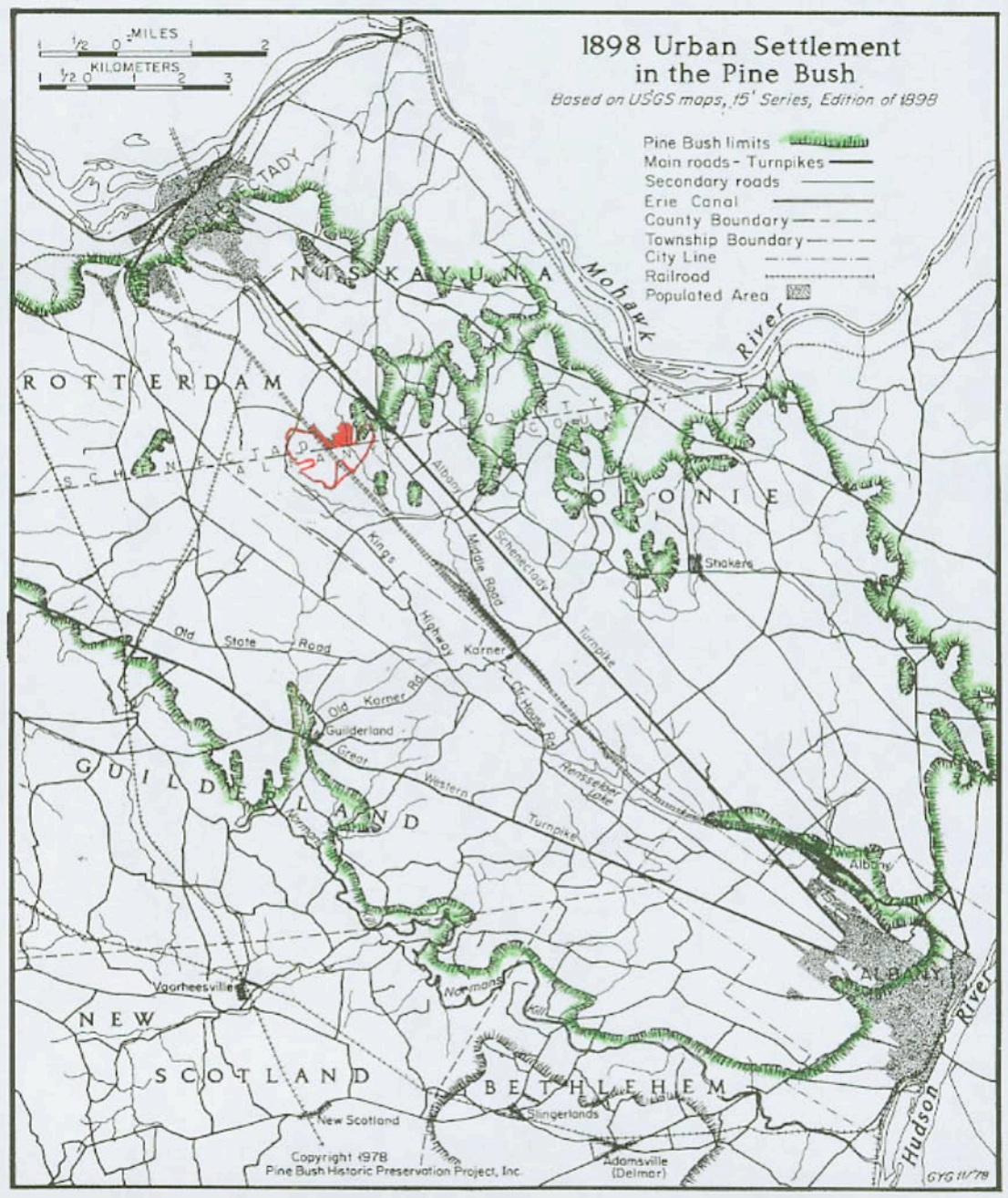
Part VI:
Appendices To Natural History

Appendix 1:



Map of the Pine Bush
showing outline of the sand plain (green), and approximate location of the present-day Woodlawn Preserve (red).
(Base map copyright © 1978 by the Pine Bush Historic Preservation Project, Inc., courtesy of Don Rittner)

Appendix 2:

Combined Woodlawn Plant Species List

Compiled by Steve Young, Program Botanist, NY Natural Heritage Program, Feb. 2004

Black = Seen in 2003 (191 spp.)
Red = on Ted Baim list not confirmed (76)
* = on Ted Baim list and confirmed in 2003 (30)

Total species = 276

?Lilium
Acer rubrum
Actaea rubra
Agalinis tenuifolia
Agrostis perennans
Agrostis scabra
Alnus incana ssp. rugosa
Amphicarpum bracteatum
Anaphalis margaritacea
Andropogon gerardii
Anemone canadensis
Anemone quinquefolia
Anemonella thalictroides
Apios americana
Apocynum androsaemifolium
Aquilegia canadensis
Arabis glabra
Aralia nudicaulis
Arisaema triphyllum*
Artemisia ambrosioides
Aster ?cordifolius
Aster divaricatus
Aster ericoides
Aster lateriflorus
Aster novae-angliae
Aster pilosus var. pringlei
Athyrium felix-foemina
Baptisia tinctoria
Berberis thunbergii*
Betula alleghaniensis
Betula populifolia*
Bidens frondosa
Boehmeria cylindrica
Botrychium multifidum
Bulbostylis capillaris
Caltha palustris
Caltha palustris
Carex lasiocarpa
Carex ovales
Carex ?laxiflora
Carex ?lupulina
Carex ?lurida
Carex ?scoparia
Carex annectens
Carex bromoides
Carex brunnescens
Carex bushii
Carex canescens
Carex comosa
Carex conoidea
Carex cristatella
Carex debilis var. rudgei
Carex disperma
Carex echinata (angustior)
Carex folliculata
Carex gracillima
Carex granularis*
Carex grayii
Carex intumescens*
Carex laxiculmis
Carex laxiflora*
Carex leptalea
Carex pedunculata
Carex pensylvanica*
Carex projecta
Carex pseudo-cyperus
Carex spp.
Carex stipata
Carex stricta*
Carex swanii
Carex tenera*
Carex tribuloides
Carex trisperma
Carex umbellata
Carex vulpinoidea*
Carpinus caroliniana
Carya ovata
Castanea dentata
Ceanothus americanus
Cenchrus longispinus
Cephalanthus occidentalis
Ceratophyllum demersum
Cinna arundinacea
Comandra umbellata*
Comptonia peregrina*
Coptis trifolia
Coptis trifolia
Cycloloma atriplicifolia
Cyperus bipartitus*
Cyperus schweinitzii
Cyperus strigosus
Cyperus strigosus/esculentus
Cypripedium pubescens
Daucus carota
Dennstaedtia punctilobula
Desmodium ?perplexum
Diervilla lonicera
Digitaria cognatum
Digitaria ischaemum*
Digitaria sanguinalis
Dryopteris carthusiana
Dryopteris clintoniana
Dryopteris cristata

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Echinochloa crusgalli
Eleocharis acicularis
Eleocharis obtusa*
Eleocharis sp.
Eleocharis tenuis
Elymus virginicus
Elytrigia repens (Agropyron)
Equisetum arvense*
Equisetum hyemale
Equisetum variegatum
Eragrostis pectinacea
Eragrostis minor (poaeoides)
Erigeron annuus
Erigeron philadelphicus
Eupatorium perfoliatum
Euthamia graminifolia
Fimbristylis autumnalis
Fragaria virginiana
Fraxinus americanus
Galium ?triflorum
Galium palustre
Gaylussacia baccata
Gentiana crinita
Geranium maculatum
Torreyochloa pallida var. fernaldii (Glyceria fernaldii)
Glyceria grandis (maxima)
Glyceria striata
Haircap moss
Hamamelis virginiana
Hieracium pratense
Hypericum virginianum
Impatiens sp.
Iris pseudacorus
Iris versicolor
Juncus acuminatus*
Juncus articulatus
Juncus brevicaudatus*
Juncus canadensis
Juncus canadensis
Juncus effusus*
Juncus marginatus*
Juncus spp.
Juncus tenuis
Lespedeza capitata
Linaria canadensis
Lindera benzoin
Liparis loeselii*
Lolium pretense
Ludwigia alternifolia
Huperzia lucidula (Lycopodium lucidulum)
Lycopodium obscurum
Lycopodium tristachyum
Lycopus americanus
Lycopus sp.
Lysimachia quadrifolia
Lythrum salicaria
Maianthemum canadense
Maianthemum. racemosum
Matteucia struthopteris
Medeola virginiana
Medicago sativa
Mirabilis nyctaginea
Mitella diphylla
Monarda didyma
Monarda punctata
Muhlenbergia mexicana
Oenothera biennis
Oenothera parviflora
Onoclea sensibilis
Ophioglossum vulgatum
Osmunda cinnamomea
Osmunda claytonii
Osmunda regalis
Panicum columbianum
Panicum dichotomiflorum
Panicum lanuginosum
Panicum latifolium
Parthenocissus quinquefolius
Penstemon digitalis
Phalaris arundinacea
Phragmites australis
Pinus rigida*
Pinus strobus
Platanthera clavellata
Poa pratensis
Poa spp.
Podophyllum peltatum
Polygonum amphibium
Polygonum hydropiper
Polygonum lapathifolium
Polygonum pensylvanicum*
Polygonum persicaria
Polygonum sagittatum
Polygonum scandens
Polystichum acrostichoides
Populus deltoides
Populus tremuloides
Potentilla simplex
Prenanthes sp.
Pteridium aquilinum
Pyrola elliptica
Quercus bicolor
Quercus alba
Quercus alba x bicolor
Quercus bicolor
Quercus coccinea
Quercus ilicifolia*
Quercus montana
Quercus prinoides

Combined Woodlawn Plant Species List

Compiled by Steve Young, Program Botanist, NY Natural Heritage Program, Feb. 2004

Quercus rubra
Ranunculus acris
Ranunculus bulbosus
Ranunculus pensylvanicus
Rhynchospora capitellata
Robinia pseudo-acacia
Rosa carolina
Rubus ?pubescens
Rubus sp.
Salix alba*
Salix bebbii
Salix humilis
Salix lucida
Salix nigra*
Salix purpurea
Salix rigida
Salix spp.
Sassafras albidum
Schizachyrium scoparium*
Scirpus atrovirens
Scirpus cyperinus
Scirpus microcarpus
Scleranthus annuus
Senecio aureus
Silene latifolia
Sisyrinchium angustifolium*
Sium suave
Smilax herbacea
Solidago canadensis
Solidago gigantea
Solidago juncea
Solidago nemoralis
Solidago rugosa
Sphenopholis obtusata var. major (intermedia)
Spiranthes cernua*
Sporobolus cryptandrus
Sporobolus neglectus
Stellaria graminea
Symplocarpos foetidus*
Thalictrum dioicum
Thalictrum pubescens
Thalictrum revolutum
Thelypteris noveboracensis
Thelypteris palustris
Tiarella cordifolia
Tilia americana
Toxicodendron radicans
Triadenum virginianum
Trientalis borealis
Trifolium pratense
Trifolium repens
Tsuga canadensis
Uvularia sessilifolia*
Vaccinium angustifolium
Vaccinium corymbosum
Veratrum viride
Verbena hastata
Viburnum acerifolium
Vitis riparia
Vitis sp.
Zanthoxylum americanum

Appendix 3
Birds of the Woodlawn Area (2009-10)
(Compiled by Alan Schroeder)

Birds of the Woodlawn Preserve, Schenectady, New York

Compiled by Alan Schroeder

Following is a list of 75 species of birds found to occur at the Woodlawn Preserve, Schenectady County, New York. Confirmed breeding species are preceded by an * . Symbols indicative of seasonal abundance for each species are as follows.

P - *Permanent Resident* - birds which can be found on the preserve all year.
S - *Summer Resident* - birds which are present throughout the spring and summer months.
M - *Migrant* - birds, also considered "Transients", which might be found during spring and/or fall migration but not present at other times of the year.
W - *Winter Visitor* - birds, usually northern species, that might spend the winter months in the area.

a - *abundant - can easily be found during any visit*
c - *common - can usually be observed at proper time & habitat*
o - *occasional - may occur regularly but in small numbers*
u - *uncommon - does not occur regularly*
r - *rare - 1 to 10 confirmed sightings*

For some species there is an insufficient amount of data to designate an accurate seasonal and/or abundance designation.

Goose, Canada *(Branta canadensis)* . . . . . *S / c*
Duck, American Black *(Anas rubripes)* . . . . . .
Mallard *(Anas platrhynchos)* . . . . . *P / c*
Green-winged Teal *(Anas crecca)* . . . . . *M*
Common Merganser, *(Mergus merganser)* . . . . . *M*
* Turkey, Wild *(Meleagris gallopavo)* . . . . . *P / o*
Grebe, pied-billed *(Podilymbus podiceps)* . . . . . *M*
Cormorant, Double-crested *(Phalacrocorax auritus)* . . .
Heron, Great Blue *(Ardea herodias)* . . . . . *S / c*
* Green *(Butorides virescens)* . . . . . *S / o*
Egret, Great *(Ardea alba)* . . . . . .
Vulture, Turkey *(Cathartes aura)* . . . . . *S*
Osprey *(Pandion haliaetus)* . . . . . .
Hawk, Coopers *(Accipiter cooperii)* . . . . . .
Broad-winged *(Buteo platypterus)* . . . . . *S*
Red-tailed *(Buteo jamaicensis)* . . . . . *S / o*

Killdeer *(Charadrius vociferus)* . . . . . *S / o*
Sandpiper, Spotted *(Actitis hypoleucos)* . . . . . *S / o*
Solitary *(Tringa solitaria)* . . . . . *M*
Least *(Calidris minutilla)* . . . . . *M*
Yellow-legs, Greater *(Tringa melanoleuca)* . . . . . *M*
Gull, Herring *(Larus argentatus)* . . . . . .
Dove, Rock *(Columba livia)* . . . . . *P*
* Mourning *(Zenaida nacelles)* . . . . . *P / c*
Swift, Chimney *(Chaetura pelagica)* . . . . . .
Hummingbird, Ruby-throated *(Archilochus colubris)* . . *S / o*
Kingfisher, Belted *(Ceryle Alcuin)* . . . . . *S / c*
Woodpecker, Red-bellied *(Melanerpes carolinus)* . . . . *P / o*
Downy *(Picoides pubescent)* . . . . . *P / c*
Hairy *(Picoides violists)* . . . . . *P / c*
Pileated *(Dryocopus pileatus)* . . . . . *P / u*
* Flicker, Northern *(Colaptes auratus)* . . . . . *S / c*
Phoebe, Eastern *(Sayornis phoebe)* . . . . . *M*
Kingbird, Eastern *(Tyrannus tyrannus)* . . . . . *S*
Vireo, Red-eyed *(Vireo olivaceus)* . . . . . *S*
Jay, Blue *(Cyanocitta cristata)* . . . . . *P / c*
Crow, Common *(Corvus brachyrhynchos)* . . . . . *P / c*
* Swallow, Tree *(Tachycineta bicolor)* . . . . . *S / c*
Barn *(Hirundo rustic)* . . . . . .
Chickadee, Black-capped *(Parus atricapillus)* . . . . . *P / c*
Titmouse, Tufted *(Parus bicolor)* . . . . . *P / c*
Nuthatch, White-breasted *(Sitta carolinensis)* . . . . . *P / c*
Wren, House *(Troglodytes aedon)* . . . . . *S / u*
Carolina *(Thryothorus ludovicianus)* . . . . . *S / u*
Kinglet, ruby-crowned *(Regulus calendula)* . . . . . .
* Bluebird, Eastern *(Sialia sialis)* . . . . . *S / c*
Thrush, Hermit *(Catharus guttatus)* . . . . . *M*
Wood *(Hylocichia mushrooms)* . . . . . *S*
* Robin, American *(Turdus migrators)* . . . . . *S / c*
* Catbird, Gray *(Dumetella carolinensis)* . . . . . *S / c*
Mockingbird, Northern *(Mimus polyglottos)* . . . . . .
Thrasher, Brown *(Toxostoma rufum)* . . . . . .
Starling, European *(Sturnus vulgaris)* . . . . . *P / c*

Waxwing, Cedar *(Bombycilla cedrorum)* . . . . . *S / c*
Warbler, Nashville *(Vermivora ruficapilla)* . . . . . *M*
Magnolia *(Dendroica magnolia)* . . . . . *M*
Black-throated Blue *(Dendroica caerulescens)* . *M*
Yellow-rumped *(Dendroica coronata)* . . . . . *M*
Palm *(Dendroica discolor)* . . . . . *M*
Black & White *(Mniotilta varia)* . . . . . *M*
Redstart, American *(Setophaga ruticilla)* . . . . . *M*
Sparrow, American Tree *(Spizella arborea)* . . . . . *W*
Chipping *(Spizella passerine)* . . . . . *S / c*
White-crowned *(Zonotrichia leucophrys)* . . . . . *M*
White-throated *(Zonotrichia albicollis)* . . . . . *M*
* Song *(Melospiza melody)* . . . . . *S / c*
Junco, Dark-eyed *(Junco hyemalis)* . . . . . *W*
* Cardinal, Northern *(Cardinalis cardinals)* . . . . . *P / c*
Grosbeak, Rose-breasted *(Pheucticus ludovicianus)* . . . *S / c*
* Blackbird, Red-winged *(Agelaius phoenixes)* . . . . . *S / c*
Grackle, Common *(Quiscalus quiscula)* . . . . . *S / c*
Cowbird, Brown-headed *(Molothrus ater)* . . . . . *S*
* Oriole, Northern *(Icterus galbula)* . . . . . *S / c*
* Goldfinch, American *(Carduelis tristis)* . . . . . *P / c*
* Sparrow, House *(Passer domesticus)* . . . . . *P / c*

Woodlawn Preserve lies at the converging point of four census blocks (each approximately three miles square) used for the NYS Breeding Bird Atlas project. In addition to the above listed species the following species were recorded as breeding or possibly breeding within these blocks, although not necessarily within the preserve boundaries.

Bobolink
Bunting, Indigo
Cowbird, Brown-headed
Creeper, Brown
Crow, Fish
Cuckoo, Yellow-billed
Duck, Wood
Finch, House
Finch, Purple
Flycatcher, Great-crested
Flycatcher, Willow

Grouse, Ruffed
Hawk, Sharp-shinned
Nuthatch, Red-breasted
Ovenbird
Owl, Barred
Owl, Eastern Screech
Owl, Great Horned
Sapsucker, Yellow-bellied
Swallow, Bank
Tanager, Scarlet
Towhee, Eastern
Veery
Warbler, Black-throated Green
Warbler, Chestnut-sided
Warbler, Pine
Pewee, Eastern Wood
Wren, Winter
Yellowthroat, Common

While many species regularly observed in the Capital Region may, at some time, be present at Woodlawn there is currently an overall shortage of confirmed records for the Preserve. Anyone wishing to contribute sighting records may contact me through the Woodlawn Preserve Facebook site at *http://www.facebook.com/group.php?gid=113747845320535* or EarthDay49@yahoo.com.

Appendix 4:

Butterflies of the Albany Pine Bush, New York

Compiled by Robert Dirig
August 2005

With a few exceptions, common names follow Jacqueline Y. Miller's *Common Names of North American Butterflies* (1992), and scientific names follow *Butterflies of the East Coast, An Observer's Guide,* by Rich Cech & Guy Tudor (2005).

Sources for Albany Pine Bush records include works by Eights (1835-1836, 1853), Emmons (1854), Lintner (1872, 1873), Bailey (1877), Forbes (1928), Shapiro (1974), Dirig (1985, 1992, 1994, 2003), McCabe (2003), and personal field work and collections research since 1973.

Code for Symbols:

P = permanent resident
M = annual or frequent migrant
S = rare stray
H = historical records, no longer present
I = European introduction
N = at or near northern limit
E = a locally endangered species
R = rare in the Pine Bush
W = newly or recently established
* = new species record for region

[This list includes 36 skippers, 6 swallowtails, 11 pierids, 20 lycaenids, 24 nymphalids, 6 satyrids, & 1 danaid, for a **total of 104 species**.]

Skippers, Family Hesperiidae

Silver-spotted Skipper, *Epargyreus clarus.* P
Hoary Edge, *Achalarus lyciades.* P, N
Southern Cloudywing, *Thorybes bathyllus.* P, N
Northern Cloudywing, *Thorybes pylades.* P
Dreamy Duskywing, *Erynnis icelus.* P
Sleepy Duskywing, *Erynnis brizo.* H, N
Juvenal's Duskywing, *Erynnis juvenalis.* P
Mottled Duskywing, *Erynnis martialis.* P, R, E?
Columbine Duskywing, *Erynnis lucilius.* H
Wild Indigo Duskywing, *Erynnis baptisiae.* P, W?
Persius Duskywing, *Erynnis persius.* H
Common Checkered Skipper, *Pyrgus communis.*S
Common Sootywing, *Pholisora catullus.* P, N
Least Skipper, *Ancyloxypha numitor.* P
European Skipper, *Thymelicus lineola.* P, I
Leonard's Skipper, *Hesperia leonardus.* P
Cobweb Skipper, *Hesperia metea.* P, N
Indian Skipper, *Hesperia sassacus.* P
Peck's Skipper, *Polites peckius.* P
Tawny Edge, *Polites themistocles.* P
Cross-line Skipper, *Polites origines.* P
Long Dash, *Polites mystic.* P
Northern Broken Dash, *Wallengrenia egeremet.* P, N
Little Glassywing, *Pompeius verna.* P, N
Delaware Skipper, *Anatrytone logan.* P, N
Mulberry Wing, *Poanes massasoit.* P, N
Hobomok Skipper, *Poanes hobomok.* P
Coastal Broad-winged Skipper, *Poanes viator zizaniae.* W, N, W
Dion Skipper, *Euphyes dion.* P, N
Black Dash, *Euphyes conspicua.* P, N
Two-spotted Skipper, *Euphyes bimacula.* P, R, H?
Dun Skipper, *Euphyes vestris.* P
Dusted Skipper, *Atrytonopsis hianna.* P, N
Salt-and-Pepper Skipper, *Amblyscirtes hegon,* P
Roadside Skipper, *Amblyscirtes vialis.* P,
Brazilian Skipper, *Calpodes ethlius,* S, N

Swallowtails, Family Papilionidae

Pipevine Swallowtail, *Battus philenor,* S, N
Eastern Black Swallowtail, *Papilio polyxenes.* P
Giant Swallowtail, *Heraclides cresphontes,* H, S, N
Tiger Swallowtail, *Papilio glaucus.* P
Canadian Tiger Swallowtail, *Papilio canadensis.* P
Spicebush Swallowtail, *Papilio troilus.* P, N

Whites & Sulphurs, Family Pieridae

Checkered White, *Pontia protodice.* H, N
Mustard White, *Pieris oleracea.* H
Toothwort White, *Pieris virginiensis,* H, N
Cabbage White, *Pieris rapae.* P, I
European Large White, *Pieris brassicae,* H, I
Clouded Sulphur, *Colias philodice.* P
Pink-edged Sulphur, *Colias interior,* P, H
Alfalfa Butterfly, *Colias eurytheme.*P, N
*Southern Dogface, *Zerene cesonia.* S
Cloudless Sulphur, *Phoebis sennae.* S
Little Sulphur, *Eurema lisa.* S

Gossamer-winged Butterflies, Family Lycaenidae

Harvester, *Feniseca tarquinius.* P
American Copper, *Lycaena phlaeas.* P
Bronze Copper, *Lycaena hyllus.* H, R
Coral Hairstreak, *Harkenclenus titus.* P
Acadian Hairstreak, *Satyrium acadicum.* P
Edwards' Hairstreak, *Satyrium edwardsii.* P
Banded Hairstreak, *Satyrium calanus.* P
Hickory Hairstreak, *Satyrium caryaevorum.* P, N
Striped Hairstreak, *Satryrium liparops.* P
*Oak Hairstreak, *Fixsenia favonius.* P, N
Brown Elfin, *Incisalia augustinus.* P
Frosted Elfin, *Incisalia irus.* P, N, E?
Henry's Elfin, *Incisalia henrici,* P, H?, N, E?
Eastern Pine Elfin, *Incisalia niphon.* P
Gray Hairstreak, *Strymon melinus,* P or M?, N
Eastern Tailed Blue, *Everes comyntas.* P
Spring Azure group [3+ spp.], *Celastrina ladon.* P
Summer Azure, *Celastrina neglecta.* P
*Northern Silvery Blue, *Glaucopsyche lygdamus couperi.* P?, W
Karner Blue, *Lycaeides melissa samuelis,* P, R, E

Brush-footed Butterflies, Family Nymphalidae

Variegated Fritillary, *Euptoieta claudia.* S
Great Spangled Fritillary, *Speyeria cybele.* P
Aphrodite Fritillary, *Speyeria aphrodite.* P
Regal Fritillary, *Speyeria idalia.* H, N, E
Silver-bordered Fritillary, *Boloria selene.* P, H?
Meadow Fritillary, *Boloria bellona,* P, H?
Silvery Checkerspot, *Chlosyne nycteis,* P, H?
Harris' Checkerspot, *Chlosyne harrisii.* P
Pearl Crescent, *Phyciodes tharos.* P
Tawny Crescent, *Phyciodes batesii.* H, E
Baltimore, *Euphydryas phaeton.* P
Questionmark, *Polygonia interrogationis.* M
Eastern Comma, *Polygonia comma.* M
Grey Comma, *Polygonia progne,* P
Compton Tortoiseshell, *Nymphalis vau-album.* M
Mourning Cloak, *Nymphalis antiopa.* P? and M
Milbert's Tortoiseshell, *Aglais milberti,* S or M?
European Small Tortoiseshell, *Aglais urticae.* H, I
American Painted Lady, *Vanessa virginiensis.* M
Cosmopolitan Painted Lady, *Vanessa cardui.* M, R
Red Admiral, *Vanessa atalanta.* M
Common Buckeye, *Junonia coenia.* S
Banded/Red-spotted Purples, *Limenitis arthemis* (intergrades). P
Viceroy, *Limenitis archippus.* P

Satyrs & Wood Nymphs, Family Satyridae

Northern Pearly Eye, *Enodia anthedon.* P
Eyed Brown, *Satyrodes eurydice.* P
Appalachian Brown, *Satyrodes appalachia.* P
Little Wood Satyr, *Megisto cymela.* P
Inornate Ringlet, *Coenonympha inornata.* P, W
Common Wood Nymph, *Cercyonis pegala.* P

Monarchs, Family Danaidae

Monarch, *Danaus plexippus.* M

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Appendix 5:

Butterflies of Schenectady County, New York, Including the Western Pine Bush

Compiled by Robert Dirig
November 2008

With a few exceptions, common names follow Jacqueline Y. Miller's *Common Names of North American Butterflies* (1992), and scientific names follow *Butterflies of the East Coast, An Observer's Guide,* by Rich Cech & Guy Tudor (2005).

Sources include Forbes (1928), Shapiro (1974), Fiore & Wallstrom (2002-2006), Gochfeld (1993-2001) [=VFC], Opler *et al.* (2008), and personal fieldwork and collections research since 1973.

Code for Symbols:

P = permanent resident
M = annual or frequent migrant
S = rare stray
H = historical records, no longer present
N = at or near northern limit
E = a locally endangered species
R = rare in the Pine Bush
W = newly or recently established
* = naturalized European species

[This list includes 30 skippers, 4 swallowtails, 4 pierids, 20 lycaenids, 19 nymphalids, 6 satyrids, & 1 danaid, for a **total of 84 species**.]

Skippers, Family Hesperiidae

Silver-spotted Skipper, *Epargyreus clarus.* P (Shapiro 1974; Opler, GSGS; VFC)
Hoary Edge, *Achalarus lyciades.* P, N (VFC)
Southern Cloudywing, *Thorybes bathyllus.* P, N (VFC)
Northern Cloudywing, *Thorybes pylades.* P (Shapiro 1974; Opler 2008; VFC)
Dreamy Duskywing, *Erynnis icelus.* P (Shapiro 1974; Opler, USGS)
Sleepy Duskywing, *Erynnis brizo.* H, N (Shapiro 1974; Opler 2008)
Juvenal's Duskywing, *Erynnis juvenalis.* P (Shapiro 1974; Opler 2008)
Mottled Duskywing, *Erynnis martialis.* P, R, E? (Shapiro 1974; Opler 2008; VFC)
Columbine Duskywing, *Erynnis lucilius.* H (Opler 2008)
Common Sootywing, *Pholisora catullus.* P, N (Shapiro 1974; 8 June 2002 (Fiore & Wallstrom 2003; Opler 2008; VFC)
Least Skipper, *Ancyloxypha numitor.* P (Shapiro 1974; Opler 2008; VFC)
*European Skipper, *Thymelicus lineola.* P (VFC)
Leonard's Skipper, *Hesperia leonardus.* P, R (R. Dirig obs., 13 Sept. 1979; Opler 2008)
Cobweb Skipper, *Hesperia metea.* P, N, R (Shapiro 1974; Opler 2008)
Indian Skipper, *Hesperia sassacus.* P, R (Shapiro 1974; Opler 2008)
Peck's Skipper, *Polites peckius.* P (Shapiro 1974; Opler 2008; VFC)
Tawny Edge, *Polites themistocles.* P (Shapiro 1974; Opler 2008; VFC)
Cross-line Skipper, *Polites origines.* P (Shapiro 1974; Opler 2008; VFC)
Long Dash, *Polites mystic.* P (Shapiro 1974; Opler 2008; VFC)
Northern Broken Dash, *Wallengrenia egeremet.* P, N (Shapiro 1974; Opler 2008; VFC)
Little Glassywing, *Pompeius verna.* P, N (Shapiro 1974; Opler 2008; VFC)
Delaware Skipper, *Anatrytone logan.* P, N (VFC)
Mulberry Wing, *Poanes massasoit.* P, N (VFC)
Hobomok Skipper, *Poanes hobomok.* P (Shapiro 1974; Opler 2008; VFC)
Coastal Broad-winged Skipper, *Poanes viator zizaniae.* N, W (VFC)
Dion Skipper, *Euphyes dion.* P, N (VFC)
Black Dash, *Euphyes conspicua.* P, N (Shapiro 1974; Opler 2008; VFC)
Two-spotted Skipper, *Euphyes bimacula.* P, R, H? (Shapiro 1974; Opler 2008)
Dun Skipper, *Euphyes vestris.* P (Shapiro 1974; Opler 2008; VFC)
Roadside Skipper, *Amblyscirtes vialis.* P (Shapiro 1974; Opler 2008; VFC)

Swallowtails, Family Papilionidae

Eastern Black Swallowtail, *Papilio polyxenes.* P (Shapiro 1974; Opler 2008; VFC)
Tiger Swallowtail, *Papilio glaucus.* P (Shapiro 1974; VFC)
Canadian Tiger Swallowtail, *Papilio canadensis.* P (Opler 2008)
Spicebush Swallowtail, *Papilio troilus.* P, N (Opler 2008)

Whites & Sulphurs, Family Pieridae

*Cabbage White, *Pieris rapae.* P (VFC)
Clouded Sulphur, *Colias philodice.* P (Opler 2008; VFC)
Alfalfa Butterfly, *Colias eurytheme.*P, N (Shapiro 1974; Opler 2008; VFC)
Southern Dogface, *Zerene cesonia.* S (NYSM specimen)

Gossamer-winged Butterflies, Family Lycaenidae

Harvester, *Feniseca tarquinius.* P (Shapiro 1974; Opler 2008)
American Copper, *Lycaena phlaeas.* P (Shapiro 1974; Opler 2008; VFC)
Bronze Copper, *Lycaena hyllus.* H, R (VFC)
Coral Hairstreak, *Harkenclenus titus.* P (VFC)
Acadian Hairstreak, *Satyrium acadicum.* P (VFC)
Edwards' Hairstreak, *Satyrium edwardsii.* P (Shapiro 1974; Opler 2008; VFC)
Banded Hairstreak, *Satyrium calanus.* P (Shapiro 1974; Opler 2008; VFC)
Hickory Hairstreak, *Satyrium caryaevorum.* P, N (Shapiro 1974; Opler 2008; VFC)
Striped Hairstreak, *Satryrium liparops.* P (Opler 2008; VFC)
Brown Elfin, *Incisalia augustinus.* P (Shapiro 1974; Opler 2008)
Frosted Elfin, *Incisalia irus.* P, N, E? (Shapiro 1974; Opler 2008)
Henry's Elfin, *Incisalia henrici.* P, H?, N, E? (Forbes 1928; Opler 2008)
Eastern Pine Elfin, *Incisalia niphon.* P (Shapiro 1974; 8 June 2002 (Fiore & Wallstrom 2003; Opler 2008)
Hoary Elfin, *Incisalia polios* P, R, H (Shapiro 1974; Opler 2008)
Gray Hairstreak, *Strymon melinus.* P or M?, N (Shapiro 1974; VFC)
Eastern Tailed Blue, *Everes comyntas.* P (Shapiro 1974; Opler 2008; VFC)
Spring Azure group [3+ spp.], *Celastrina ladon.* P (Opler 2008; VFC)
Summer Azure, *Celastrina neglecta.* P (Opler 2008; VFC)
Northern Silvery Blue, *Glaucopsyche lygdamus couperi.* P?, W (Opler 2008)
Karner Blue, *Lycaeides melissa samuelis.* P, H, R, E (Shapiro 1974; R, Dirig personal obs., 1977-1979; Opler 2008; VFC)

Brush-footed Butterflies, Family Nymphalidae

Great Spangled Fritillary, *Speyeria cybele.* P (Shapiro 1974; Opler 2008; VFC)
Aphrodite Fritillary, *Speyeria aphrodite.* P (Shapiro 1974; Opler 2008; VFC)
Silver-bordered Fritillary, *Boloria selene.* P, H? (Shapiro 1974)
Meadow Fritillary, *Boloria bellona.* P, H? (VFC)
Silvery Checkerspot, *Chlosyne nycteis.* P, H? (Shapiro 1974; Opler 2008)
Harris' Checkerspot, *Chlosyne harrisii.* P (Shapiro 1974; Opler 2008)
Pearl Crescent, *Phyciodes tharos.* P (VFC)
Tawny Crescent, *Phyciodes batesii.* H, E (Shapiro 1974; Opler 2008)
Baltimore, *Euphydryas phaeton.* P (Shapiro 1974; Opler 2008; VFC)
Questionmark, *Polygonia interrogationis.* M (VFC)
Eastern Comma, *Polygonia comma.* M (Shapiro 1974; Opler 2008; VFC)
Compton Tortoiseshell, *Nymphalis vau-album.* M (Shapiro 1974; Opler 2008; VFC)
Mourning Cloak, *Nymphalis antiopa.* P? and M (VFC)
Milbert's Tortoiseshell, *Aglais milberti.* S or M? (VFC)
American Painted Lady, *Vanessa virginiensis.* M (Shapiro 1974; Opler 2008; VFC)
Cosmopolitan Painted Lady, *Vanessa cardui.* M, R (VFC)
Red Admiral, *Vanessa atalanta.* M (VFC)
Banded/Red-spotted Purples, *Limenitis arthemis* (intergrades). P (Shapiro 1974; Opler 2008; VFC)
Viceroy, *Limenitis archippus.* P (Shapiro 1974; Opler 2008; VFC)

Satyrs & Wood Nymphs, Family Satyridae

Northern Pearly Eye, *Enodia anthedon.* P (Shapiro 1974; Opler 2008; VFC)
Eyed Brown, *Satyrodes eurydice.* P (Shapiro 1974; Opler 2008; VFC)
Appalachian Brown, *Satyrodes appalachia.* P (VFC)
Little Wood Satyr, *Megisto cymela.* P (Shapiro 1974; Opler 2008; VFC)
Inornate Ringlet, *Coenonympha inornata.* P, W (VFC)
Common Wood Nymph, *Cercyonis pegala.* P (Shapiro 1974; Opler 2008; VFC)

Monarchs, Family Danaidae

Monarch, *Danaus plexippus.* M (Opler 2008; VFC)

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Appendix 6:

Karner Blues in Schenectady Co., NY, 1978-1979

[Transcribed from John F. Cryan's Annotated List of Karner Blue Populations (1980: pages 14-16)]

CARMAN. Schenectady Quad, Unit No. 23. Location: Rotterdam Town, Carman, ca. 170 m W of Rt. 7, ca. 200 m N of High Bridge Rd., just E of old RR grade, W of Bryan Avenue Area: ca. 0.5 ha. (1¼ ac.). Discovered: 1978 by Cryan and Dirig. Butterfly Numbers: ca. 115 spring brood adults; 310 summer brood adults (1979; mark-recapture using Jolly statistics and Lincoln index). Lupine Numbers: ca. 165 plants (1979). Site: Grassy, vacant lot behind factory and old RR grade, and next to house of lot owner. Lupine is on a small, SW-facing bank in a dense stand. N of site, Scrub and Dwarf Chestnut Oak extend under a power ROW over old RR for ca. 50 m; lupine occurs in scattered clumps for about 10 m. Lot was burned by fire set by children 2 or 3 years ago (owner information); this has kept many pine barrens upland plants nearby. Butterflies do not stray far from host, and feed on abundant New Jersey Tea, several Rubus species, Knapweed, and milkweeds in lot. Status: Threatened. Although owner does not plan to build on lot, the small size of the lupine stand and accessibility of the site make chance loss of this population likely. Owner says local children frequent area and congregate in lot (despite posting), and dumping has occurred in rear of lot. Notes: Lupine occurs down old RR grade, ca. 275 m SSW of site, at jct. High Bridge Rd. and Campbell Avenue, but the Karner Blue does not use these plants.

COUNTY LINE DUNE. Schenectady Quad, Unit No. 50. Location: Straddling Schenectady-Albany County line, City of Schenectady and Town of Colonie, vic. Stanford Heights, large isolated dune ca. 200-400 m NE of Penn Central RR tracks, ca. 500-750 m SE of Gifford Rd., 600-750 m NW of Cordell Rd. Area: ca. 4 ha. (10 ac.). Discovered: 1979 by J. F. Cryan and Bruce Cronemeyer. Butterfly Numbers: ca. 700-900 (summer 1979; several one-day censuses). Lupine Numbers: ca. 640 (1979). Site: Power ROW that runs over an old dune which is partially mined-out on its N side. Area burned recently because dune has thicket of shrubby oaks on its E and S side under the ROW. Herbiciding and clearing has also opened up the duneside and favored low pine barrens plants. Dune is surrounded by low sandy ground, some of which is marshy and the rest covered by a combination of mesophytic forest plants and introduced weeds. Aspens, cherries, locust, and oaks are dominant in the surrounding forests. A motorcycle trail system runs over the dune. Lupine occurs along the trail, around the rim of the mined-out section, and along the SW slopes and at the base of the dune along open sandy trails. The butterflies are scattered over a large area and wander freely throughout the ROW in search of food or egg-laying sites. They do not, however, wander from the dune vicinity or the open burned area around it. Status: Uncertain. If the sand mining continues, half of the remaining lupines will be lost. More losses are caused by the motorcycling, which kills plants near the trails. The fire was fortuitous; without it the population would now be gone or much smaller and

more vulnerable. Fire suppression has caused the loss of most pine barrens plants in the area, except for this small enclave, and will threaten the colony again. [Now part of the Woodland Preserve!]

ROUTE 7/GOLF COURSE. Schenectady Quad, Unit No. 24. Location: Town of Rotterdam, ca. 0-250 m E of Interstate Rt. 890 (Rt. 7), ca. 0-200 m S of Rt. 7, near jct. of Rt. 7 and Rt. 890 behind (W of) a garden apt. building, ca. 250 m WNW of a golf course. Area: ca. 3 ha. (ca. 7.5 ac.). Discovered: 1979 by J. F. Cryan and Bruce Cronemeyer. Butterfly Numbers: ca. 1200 summer brood adults (1979; estimates using several census techniques). Lupine Numbers: ca. 790 plants (summer 1979). Site: An open sandy area of low dune structure with strips of early successional (fire suppressed) and pine barrens vegetation interspersed with old grassy pastureland. A small oval pond with a marshy section is found at the center of the site. Lupine is concentrated in two areas: N bank of the pond, and open sandy area with pine barrens remnants very close to jct. Rts. 7 and 890. Composites, milkweeds, Sweet Clover, Knapweeds, Rubus, and many other dry sandy field-inhabiting herbs supply nectar to the butterflies, which wander throughout the area and occasionally cross the main roads. Status: Threatened. This area has been … disturbed in the recent past; long strips of pine barrens vegetation have been bulldozed, leaving swaths alternating with remnant woodland patches. This seems to be connected with an effort to expand the golf course or create a new one; the land seems to be owned by the golf course or apartment building owners. Notes: Movement of Karner Blues between this colony and the Carman one occurs. There are (or were) probably other small colonies in the Rt. 7 area, because this region has many small remnant pine barrens pockets. The pine barrens vegetation on this site is the best (and largest) example of Pine Bush flatlands of the Schenectady region; it has a distinctive structure reminiscent of Long Island because it lacks the dune substrate which patterns the eastern Pine Bush vegetation. In W Rotterdam, there are three large lupine populations which do not presently support Karner Blues; These occur as a cluster within one km of each other, but are some 5-6 kms removed from the cluster of three active Karner Blue colonies to their east (of which this is one). They may have once supported the butterfly but it probably went extinct regionally and could not be recolonized from the three active sites over that distance.

Appendix 7:

Schenectady County, New York, 13 Sept. 1979

From Field Notes of Robert Dirig

I went to one of the small surviving remnants of pine barrens vegetation in the western part of the Karner Sand Delta near Schenectady. Location of the site is:

NEW YORK, Karner Pine Bush (western fringe), Schenectady County, Town of Rotterdam; utility pole R.O.W. extending from Schenectady/Duanesburg Road (Rt. 7) on the NW (just E of Dolan Drive), SSE for ca. 2000 ft., and intersecting with Dunnsville Rd. (Rt. 9R) ca. 2000 ft. N of the NYS Thruway (Rt. 90) at benchmark 337.

My object in revisiting this site—which John Cryan and I had explored previously on 30 May 1978, while searching for Karner Blues near Schenectady—was to look for the tiny Oyster Lichen on Pitch Pine, to make an extensive search of the Reindeer Lichens for rarer species, and also study the Pink Earth Lichen. While doing this, I also kept an extensive list of the plant and animal life (latter bolded below). I parked on the verge of Rt. 7, so my notes proceed from NW to SE [*non-native plants are marked with an asterisk]:

Stiff-leaved Aster (Aster lineariifolius): very abundant beneath the wires.

New Jersey Tea (Ceanothus americanus): a few small clumps in the R.O.W.

Nipple Lichen, Gnome Fingers (Pycnothelia papillaria): huge mats covering several square yards, the richest stand in the Pine Bush known to me.

Shinleaf (Pyrola sp.): in fruit in the pine woods.

Pitch Pine (Pinus rigida): very large trees.

White Pine (P. strobus): some present, smaller.

Lowbush Blueberry (Vaccinium angustifolium): a few plants.

Low Sweet Blueberry (V. pallidum): a few.

Big-toothed Aspen (Populus grandidentata).

Trembling Aspen (P. tremuloides): more than the latter, some over 1 ft. dbh.

Black Cherry (Prunus serotina).

Haircap Moss (Polytrichum sp.): in the woods.

Oyster Lichen (Hypocenomyce scalaris): very heavy growths on nearly every Pitch Pine.

Scrub Oak (Quercus ilicifolia): some small shrubs.

Canada Mayflower (Maianthemum canadense): leaves.

Pink Ladyslipper (Cypripedium acaule): leaves.

[A THICK BED OF NEEDLES AND DUFF UNDERFOOT — THE AREA HAS NOT BURNED FOR YEARS!]

Common Reindeer Lichen (Cladina rangiferina): growing on needles and Haircap Moss in the woods.

Blue Jays (Cyannocitta cristata) and Eastern Chipmunks (Tamias striatus) sounded the alarm as I moved slowly and quietly through the woods.

Running Pine, Ground Cedar (Lycopodium complanatum): surface vine growing over fallen pine needles in two places, NW and SE of Rt. 9R.

Little Bluestem (Schizachyrium scoparium).

*Common Yarrow (Achillea millefolium): leaves.

Goldenrods (Solidago spp.).

Wild Strawberry (Fragaria virginiana).

Pussytoes (Antennaria cf. neglecta): rosettes of a small-leaved species.

Pearly Everlasting (Anaphalis margaritacea): large clumps in the R.O.W., in fruit, the flowers browned.

[OTHERS ABOVE IN A WOODY PLOT ON THE NE EDGE.]

SE OF RT. 9R:

Wild Lupine (Lupinus perennis): dead seed pods and 4 or 5 plants still with some leaves, largely whitened by a Powdery Mildew (probably Erisyphe polygoni). [Observed 30 May 1978 on SE bank of Rt. 9R, in bloom, blue flowers and forma leucanthus, with white flowers].

White Oak (Quercus alba): occasional.

Whorled Loosestrife (Lysimachia quadrifolia).

Clouded Sulphur Butterfly (Colias philodice): flying in the R.O.W.
Blunt-leaved Milkweed (Asclepias amplexicaulis): both in the woods and on the R.O.W., latterly in fruit.

Paper Birch (Betula papyrifera): some large ones in the woods.

[Grey Birch (B. populifolia): NOT noted, although more likely in such a habitat.]

Scrub Oak: to 20 ft. tall there, in badly fire-suppressed conditions.

Poison Ivy (Toxicodendron radicans).

New York Fern (Thelypteris noveboracensis): in the woods.

American Beech (Fagus grandifolia): two small (6-in.-diam.) trees, the first I have seen in the Pine Bush. [Subsequent field work disclosed Beech in the ravines as well.]

*White or Silver-leaved Poplar (Populus alba): seedlings here and there.

Frostweed (Helianthemum canadense): in fruit.

British Soldiers (Cladonia cristatella): thickly covering Pitch Pine lignum on the ground.

Red Cedar (Juniperus virginiana): a small, 8-ft.-tall tree in the woods, the second Pine Bush station known to me.

Dewberry (Rubus spp., probably R. flagellaris).

Grey Dogwood (Cornus foemina, ssp. racemosa): a shrubby species with white, red-pedicelled fruits.

Arrow-wood (Viburnum dentatum).

Red Maple (Acer rubrum).

Virginia Creeper (Parthenocissus sp.): in a wetter spot.

Chlorociboria sp.: an ascomycete, its lovely blue-green coloring on the wood catching my eye. I broke apart the wood and found a few of the gorgeous turquoise-green apothecia!

[THE R.O.W. HERE HAD ANOTHER BRANCH OFF TO THE NE, SHOWING EVIDENCE OF WEED-KILLERS, AND WITH MOWED HERBAGE LYING ALONG IT. I DID NOT EXPLORE THIS.]

PROCEEDING SE ON THE ORIGINAL R.O.W.:

*Spotted Knapweed (Centaurea maculosa): in fruit.

Reindeer Lichens (Cladina spp.): several square yards, the largest stands in the Pine Bush!

Monarch (Danaus plexippus): one sailed by.

Praying Mantis.

New England Aster (Aster novaeangliae): in bloom beneath the lines.

*Butter-and-Eggs (Linaria vulgaris): in bloom beneath the lines.

RETURNING BACK ALONG THE R.O.W., NW OF RT. 9R:

Leonard's Skipper (Hesperia leonardus), one of the rare Pine Bush butterflies, probably associated here with Little Bluestem as a larval foodplant.

Cow-wheat (Melampyrum lineare): in bloom.

Bluecurls (Trichostema dichotomum): with small blue flowers.

Sand Jointweed (Polygonella articulata): with pink flowers.

THE FOLLOWING LICHENS WERE SEEN TODAY AND ON 30 MAY 1978 AT THE SAME SITE:

Oyster Lichen (Hypocenomyce scalaris): on Pitch Pine.

Common Reindeer Lichen (Cladina rangiferina): smaller and less luxuriant in the shaded woods; SE of Rt. 9R, NW of Rt. 9R; also a yard-square patch over Pitch Pine needles & Haircap Moss, in opening between pines in woods bordering R.O.W.

Green Reindeer Lichen (Cladina mitis): the commonest species, covering several square yards, in the sun, and along the edges of the R.O.W., mostly on NE side; some a short distance NW of Rt. 9R, but most to the SE, and SE of the jct. of the NE-running lines.

Puffed Shield Lichen (Hypogymnia physodes): one tiny rosette at the base of a large (20-in.-dbh) Pitch Pine in the woods.

British Soldiers (Cladonia cristatella): [details above].

Pink Earth Lichen (Dibaeis baeomyces = Baeomyces roseus): found in small patches on the R.O.W. in full sun; SE of the jct. of the NE-running lines, with well-developed pink apothecia.

Thorn Lichen (Cladonia uncialis): the only Pine Bush station, small mats, ca. ½ to 1 yd. across, the larger mat just NW of Rt. 9R, and another at the jct. of the NE-running lines, SE of Rt. 9R.

Nipple Lichen, Gnome Fingers (Pycnothelia papillaria): extremely common, in fruit, all along the R.O.W.

Lemon Lichen (Candelaria concolor): on fissures in the bark of a 1-ft-dbh Trembling Aspen on the NW end of the R.O.W.

Hooded Rosette Lichen (Physcia adscendens): growing with the preceding species on fissures in the bark of a 1-ft-dbh Trembling Aspen on the NW end of the R.O.W.

Jewel Lichen (Caloplaca sp.): orange apothecia, growing with the two preceding species on fissures in the bark of a 1-ft-dbh Trembling Aspen on the NW end of the R.O.W.

Olive Cladonia (Cladonia strepsilis): 30 May 1978.

[Star-tipped Reindeer Lichen (Cladina stellaris) and Sand-loving Iceland Lichen (Cetraria arenaria) NOT seen, but carefully sought; if they survive anywhere in the Pine Bush, I would expect them here.]

THIS BRIEF GLIMPSE OF THE SCHENECTADY PINE BUSH SUGGESTS THE NEED FOR MORE FIELD WORK THERE. THIS PARTICULAR AREA IS BOTANICALLY (AND ESPECIALLY LICHENOLOGICALLY) QUITE RICH FOR THE SANDY PINE BUSH!

❀

Appendix 8:

Woodlawn Preserve
City of Schenectady,
Schenectady County, New York

Field List of Plants and Other Biota,
3-4 November 2008

Compiled by Robert Dirig

NW-to SE-tending Sand Trail Just Inside Preserve, Paralleling Chain-Link Fence from Entrance Gate (at SW end of Gifford Rd.) to N Edge of Delta Lake:

The NE side of the sand trail abuts a fringe of S- and SW-facing oak woods, with many plants characteristic of the Albany Pine Bush. The side toward Delta Lake has more naturalized, non-native plants (marked with an asterisk*).

Common Milkweed (Asclepias syriaca)
Dewberry (Rubus flagellaris)
Grey Birch (Betula populifolia)
Sweetfern (Comptonia peregrina)
Sweet Everlasting (Gnaphalium obtusifolium)
Little Bluestem (Schizachyrium scoparium)
Dwarf Cinquefoil (Potentilla canadensis)
Bush Clover (Lespedeza capitata)
*Spotted Knapweed (Centaurea maculosa)
*Deptford Pink (Dianthus armeria)
Scarlet Oak (Quercus coccinea)
Smooth Sumac (Rhus glabra)
*Garlic Mustard (Alliaria petiolata): basal rosettes in the oak woods
*Honeysuckles (Lonicera spp.)
*Japanese Knotweed (Polygonum cuspidatum group): 1 small plant in the oak woods
Common Evening Primrose (Oenothera biennis)
Spotted Horsemint (Monarda punctata)
*Queen Anne's Lace (Daucus carota)
Goldenrods (Solidago, 3-4 spp., including S. ?nemoralis)
Cottonwood (Populus deltoides)
Canadian Tick Trefoil (Desmodium canadense)
*Yucca (Yucca cf. filamentosa): apparently naturalized from nearby garden?
*Giant Mullein (Verbascum thaspus)

Grass-leaved Goldenrod (Euthamia graminifolia)
Black Cherry (Prunus serotina)
Staghorn Sumac (Rhus typhina)
Smooth Sumac
American Hazelnut (Corylus americana)
Little Bluestem: lots of it!
Oldfield Goldenrod (Solidago nemoralis)
Wild Strawberry (Fragaria virginiana)
*Common Yarrow (Achillea millefolium)
Heath Aster (Aster pilosus)
Black-eyed Susan (Rudbeckia hirta)
Black Locust (Robinia pseudoacacia)
Bush Clover (L. capitata): more!
Switchgrass (Panicum virgatum) [Leonard's Skipper?]
*Wormwood (Artemisia vulgaris)
Wild Lupine (Lupinus perennis): 2 dead stalks.
*?Peppergrass (Lepidium sp.)
Common Milkweed: more.
Common St.-John's-wort (Hypericum perforatum)
*Oriental Bittersweet (Celastrus orbiculatus)
Trembling Aspen (Populus tremuloides)
Whorled Loosestrife (Lysimachia quadrifolia)
Swamp White Oak (Quercus bicolor): tree.
Red-osier Dogwood (Cornus sericea)
Box Elder (Acer negundo)
White Vervain (Verbena urticaefolia): edge of woods.

NORTH EDGE OF DELTA LAKE:
[Different than anything I've seen in the PB, artificial.]

Broad-leaved Cattail (Typha latifolia)
*Common Reed (Phragmites australis): established and beginning to spread.
Rush (Scirpus ?validus): emergent.
Gerardia (Agalinis sp., probably A. tenuifolia): in great abundance!
Willow-herb (Epilobium sp., perhaps *): fruiting.
Boneset (Eupatorium perfoliatum)
Blue Vervain (Verbena hastata)
*Purple Loosestrife (Lythrum salicaria)
Speckled Alder (Alnus incana rugosa)
Woolgrass (Scirpus cyperinus)
Ditch Stonecrop (Penthorum sedoides)
Steeplebush (Spiraea tomentosa)
Pitch Pine (Pinus rigida): small trees drowned by flooding!

Dragonfly (Sympetrum sp.): red, black-tipped abdomen, small.
Water Purslane (Ludwigia palustris): In a shallow pool.
Scouring Rush (Equisetum hiemale): numerous.
Willows (Salix spp.): tall species.
*Sweet Clover (Melilotus alba or M. officinalis).

TOP OF SLOPE ON NE CORNER OF DELTA LAKE, BORDERING OAK WOODS, SE-FACING, A SUNNY, SANDY TRAIL (BLUE MARKERS):

Bush Clover (Lespedeza capitata): more.
Spotted Horsemint: more.
Canadian Tick-trefoil: more
[Perhaps another Desmodium sp.?]
*Wild Apple (Malus cf. pumila): naturalized.
Little Bluestem: more.
*Spotted Knapweed: more.
Common Milkweed: more.
Dewberry (Rubus flagellaris).
*Multiflora Rose (Rosa multiflora): one plant, edge of woods.
*Lonicera spp.: lots!
*Norway Maple (Acer platanoides): 1 tree.
Chestnut Oak (Quescus prinus): 1 tree.
Red Maple (Acer rubrum): a few small trees.
*Crabapple (Malus sp.): naturalized.
Winged/Dwarf Sumac (Rhus copallina): a large colony, what a wonderful find!
Witch Hazel (Hamamelis virginiana); 1 shrub, edge of woods.

DOWNSLOPE TO NE CORNER OF MARSH AROUND DELTA LAKE

*Self-Heal (Prunella vulgaris): a few, in seed.
Fringed Gentian (Gentianopsis crinita): An amazing find in such a disturbed habitat!!! Indicates limy soil. Perhaps a late bloom record?

BACK TO TOP OF BANK ALONG SAND TRAIL

Mature trees (Oaks) with nice lichens (foliose) — a good spot to interpret them.
White Pines.

SANDY BOWL (OPEN AREAS AND REMNANT DUNES) ON E SIDE OF DELTA LAKE

Although very degraded and eroded by ORVs, this area has many of the important pine barrens plants in undisturbed enclaves on the tops of dunes and edges of sand trails.

Big Bluestem (Andropogon gerardii): one plant in Bowl; another nice clump on S side.
*Rabbit's-foot Clover (Trifolium arvense): edges of Bowl.
Mourning Doves (Zenaida macroura): 4-5 picking sand in Bowl.
Belted Kingfisher (Megaceryle alcyon): flying over Delta Lake. Abundant sand banks in this region probably provide nesting sites.

HIGH DUNES, OVERGROWN WITH TREES, FIRE-SUPPRESSED, DEGRADED

Spotted Horsemint.
Little Bluestem.
Sweetfern.
Bush Clover (Lespedeza capitata).
Canadian Tick Trefoil.
Scouring Rush.
Red-osier Dogwood.
Scrub Oak.
Wild Lupine (viz. Don Rittner, 2006-2007).
Cecropia Moth (Hyalophora cecropia): cocoon on Scrub Oak!
Trembling Aspen.
*Spotted Knapweed.
New Jersey Tea.
*Honeysuckle (Lonicera spp.).
Witch Hazel.
Poison Ivy.
Bracken Fern (Pteridium aquilinum).
Grey Dogwood.
White Pine.
Pipsissewa (Chimaphila umbellata): numerous rosettes of the beautiful leaves inside the woods! Not often seen in such abundance in the Pine Bush.
Wild Strawberry.
Vaccinium angustifolium.
Dewberry.
*Oriental Bittersweet.
*Garlic Mustard.
*Queen Anne's Lace.
Black Locust.
Silverrod (Solidago bicolor): a nice ecotonal species in its natural state.
Staghorn Sumac.
Powderhorn Lichen (Cladonia coniocraea group).
Goblet Lichen (Cladonia pyxidata group)
Mosses: on shaded slopes of dune summit.
Alternating Dog Lichen (Peltigera didactyla).
Dog Lichen (Peltigera canina).

Box Elder.
Blue Wood Aster (Aster cordifolius): a very nice species.
Cottonwood.
Big-toothed Aspen.
Common Milkweed.
Wild Grape (Vitis sp.).
Sand Violet (Viola fimbriatula).
Early Sweet Blueberry (Vaccinium pallidum).

Marsh on SE and NE sides of Delta Lake

?Smooth Alder (Alnus serrulata): small shrub.
*Red Clover (Trifolium pratense): leaves at edge of lake.
*Forget-me-not (Myosotis scorpioides): rosettes at edge of lake,
Mints (Lycopus sp.): on the shore.
Sedges (Carex sp.): on the shore.
Marsh Fern (Thelypteris palustris).
Royal Fern (Osmunda regalis).
Beaver (Castor canadensis) damage?: NE side of Delta Lake stem?
Gerardia (Agalinis ?tenuifolius): masses!
Sand Rush (Bulbostylis capillaris?): carpets.
Scouring Rush.
Cottonwood.
*Queen Anne's Lace.
*Sweet Clover (Melilotus sp.).
*Giant Mullein (Verbascum thaspus): rosettes & old seed stalks.
Common Evening Primrose (Oenothera biennis).
Swamp Milkweed (Asclepias incarnata): horray!
Grass-leaved Goldenrod (Euthamia graminifolia).
Boneset (Eupatorium perfoliatum).
Black-eyed Susan (Rudbeckia hirta).
Heath Aster (Aster pilosus).
Blue Vervain (Verbena hastata).
Willow (Salix cf. petiolaris?).
*Dwarf/Siberian Elm (Ulmus pumila): small tree.
Silver Maple (Acer saccharinum).
[NO Pitch Pines!!).

Oak Woods on Top of Highest Sand Ridge (Drumlin?, Esker?) on E Edge of Schenectady Preserve

Chestnut Oak (Quercus prinus): trees.
Red Oak (Quercus borealis): trees.

Oaks (Quercus spp.): [other tree species].
Black Cherry.
Grey Birch (Betula populifolia).
Maple-leaved Viburnum (Viburnum acerifolium): small shrub.
Paper Birch (Betula papyrifera).
Whorled Loosestrife (Lysimachia quadrifolia).
Bluecurls (Triostema dichotomum): in a sandy opening.
*Self-heal (Prunella vulgaris).
*Japanese Barberry (Berberis thunbergii).
Bottlebrush Grass (Elymus hystrix).

Wooded Wetland at Base of Highest Sand Ridge, E side

Apparently the headwaters of the Lisha Kill.
Pools of standing water, with shrubs.

Swamp Dewberry (Rubus hispidus).
Black Huckleberry (Gaylussacia baccata).
Tussock Sedge (Carex stricta).
Winterberry (Ilex verticillata): including female bushes, flaming their scarlet fruit!
Meadowsweet (Spiraea latifolia).
Highbush Blueberry (Vaccinium corymbosum).
Cinnamon Fern (Osmunda cinnamomea).
Goldthread (Coptis trifolia).
Grape (Vitis sp.).
Red Maple.
Peat Moss (Sphagnum sp.).
Beaked Shorthusk [grass] (Brachyelytrum erectum).

Railroad Corridor

(mostly NE side)

Royal Fern (Osmunda regalis).
*Soapwort (Saponaria officinalis).
Grey Dogwood.
Horseweed (Conyza canadensis).
Scouring Rush.
Winged Pigweed (Cycloloma atriplicifolium): a tumbleweed on sandy slope of Callanan Pond, SW side.
*Wormwood (Artemisia vulgaris).
White Snakeroot (Eupatorium rugosum): in shade.
*Common Reed.
*Honeysuckles.

Little Bluestem: here & there along RR.
Pitch Pine (Pinus rigida): a few small trees (and one larger tree) on NE side of RR opposite Callanan Industries pond adjacent to tracks. Only living ones seen in the whole acreage.
White Pines.
Poison Ivy: huge many-armed vines growing up a large Cottonwood.
*Crabapple: naturalized.
White-tailed Deer (Odocoileus virginianus): tracks in sand under Crabapple.
*Dwarf/Siberian Elm (Ulmus pumila): small sapling.
Black-eyed Susan: a number of dead stalks, but one still with a flowerhead open!

KETTLE "BOG" (FEN) ON SW SIDE OF RAILROAD TRACKS, TOWN OF ROTTERDAM, SCHENECTADY COUNTY (CALLANAN INDUSTRIES INC. WILDLIFE HABITAT MANAGEMENT AREA), OPPOSITE DELTA LAKE

A basin filled with standing water, surrounded by a "moat" with open water, and centered with a mat of short shrubs, sedges, and forbs. Water 8 inches to 1+ ft. deep around the edges (in November). A superficial peek only. Likely a very rich habitat that needs fuller exploration in a warmer season.

Tussock Sedge (Carex stricta): Check for Mulberry Wing & Eyed Brown butterflies in July (their larvae eat this sedge).
Leatherleaf (Chamaedaphne calyculata): emergent knee-high shrubs.
Steeplebush (Spiraea tomentosa): a few, short shrubs.
Peat Moss(es) (Sphagnum sp(p).).
Buttonbush (Cephalanthus occidentalis): robust shrubs in standing water of moat.
Speckled Alder (Alnus incana rugosa): large shrubs in moat.
Tree Clubmoss (Lycopodium obscurum group): in surrounding oak woods.
Aromatic Wintergreen (Gaultheria procumbens); in surrounding oak woods.
[Canada Geese (Branta canadensis): A few on Callanan Pond, S of this basin (Town of Colonie, Albany County), 4 Nov.]

NE OF RAILROAD, ALBANY COUNTY, TOWN OF COLONIE

*Honeysuckle (Lonicera spp.): Much of it, forming essentially the whole understory throughout an open oak woods.
Big-toothed Aspen: a few large trees.
White Pine: scattered young trees.
Staghorn Sumac: huge, old (20-30 years) trees.
Stickseed (Hackelia virginiana): somewhere in this area, judging from its dispersing seeds all over my jacket! I have not seen this plant in the Pine Bush before.
Oaks.

Appendix 9:

Woods Hollow Nature Preserve
Saratoga County, New York
[formerly "Saratoga Sand Pit" Karner Blue Site]

HISTORICAL NOTES

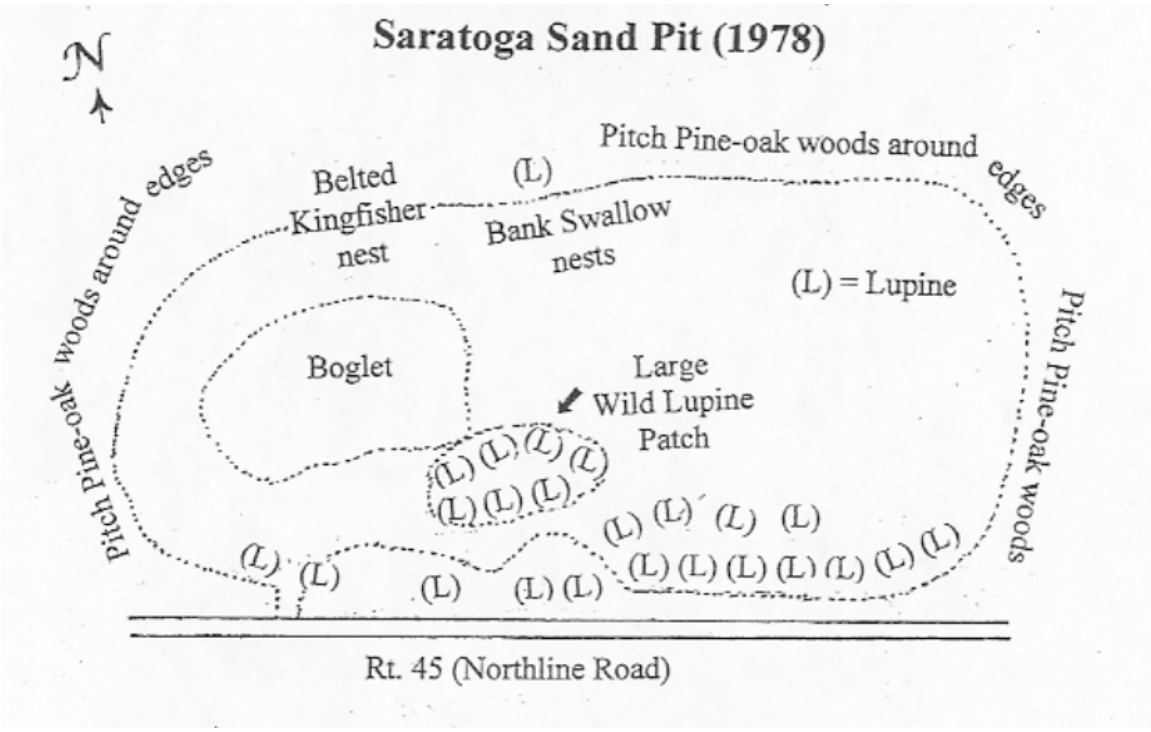
This site originally was noticed as an important subpopulation center for the endangered Karner Blue Butterfly, which was discovered there on 22 July 1975 by John F. Cryan and Robert Dirig during their preliminary search of Saratoga County for this rare insect. It is now preserved as the southern portion of the Woods Hollow Nature Preserve in the Village of Ballston Spa.

LOCATION

In 1980, Cryan produced An Annotated List of Hudson Valley Sand Belt Populations [of Karner Blue] and Their Status. His description of this site is interesting and valuable, and is reproduced below:

> Rt. 45 Sandpit. Saratoga Springs Quad, Unit No. 171. Location: Milton Town, old abandoned sandpit ca. 0-150 m N of Co. Rt. 45, ca. 250-350 m E of Rowland St., ca. 450-550 m W of State Rt. 50. Area: ca. 5 ha. (12.5 ac.). Discovered: 1975 by Cryan and Dirig. [Karner Blue] Butterfly Numbers: ca. 310 spring brood adults, ca. 1000 summer brood adults (1979; mark-recapture using Jolly statistics). Lupine Numbers: ca. 540 plants (1979). Site: An old sandpit in a low dune area with groundwater exposed in its central and E sides and many marsh and acid bog plants growing intermingled with pine barrens upland plants, including lupine, on slightly higher ground on the pit bottom. The upper rim on the S side also has some lupine, as does the entrance road and the N side of Rt. 45 S of the pit. Bog Clubmoss (Lycopodium inundatum), Round-leaved Sundews (Drosera rotundifolia), many bog and acid marsh sedges and rushes, Swamp Candles (Lysimachia terrestris), and sphagnum mosses occur in the boggy part of the pit. Lupine is found mostly in the central and east part of the pit bottom. [Karner Blue] Butterflies are found along Rt. 45, the entrance road (sand), and scattered throughout the pit bottom and upper rim on the S and E sides. Nectar sources include many species of bog and marsh wildflowers (including sundews), as well as the usual upland pine barrens plants. The pit is surrounded by fire-suppressed pine-oak forest. Status: Uncertain. If the pit is reopened, the [Karner Blue] population will be lost. Motocyclists keep about one-half of the pit bottom denuded, so that lupine is restricted to edges or in-between wet areas. They kill many plants each year and are slowly destroying the pit rim lupines through erosion. This sandpit should be protected not only for the Karner Blue population, but also for the fascinating marsh and bog plant assemblage that has colonized the pit following abandonment (there must be a bog nearby, or so many plant species would not have come into the pit in such a short time).

This field sketch of the original Sand Pit was made by R. Dirig in 1978:



Claire K. Schmitt & Judith S. Wolk compiled a booklet on Natural Areas of Saratoga County, New York in 1998 that includes a description and map of the Woods Hollow Nature Preserve (pp. 34-35). This wonderful preserve incorporates the original Sand Pit on its southern edge.

The following species list dates from the mid- to late 1970s, during Cryan & Dirig's early exploratory and documentary stages of field study at this site. Recent species notes by Dirig from 2003-2006 supplement the early records, made about 30 years after the original explorations, and after it had been set aside as the southern part of the Woods Hollow Nature Preserve. None of the sections is a complete record, but rather a field compilation of species noticed. Asterisks (*) indicate naturalized European plants and Lepidoptera.

VASCULAR FLORA

American Dewberry (Rubus flagellaris): 1975-1979; 30 May 2003.
Bastard Toadflax (Commandra umbellata): 1975-1979; obs. 7 June 1979.
Bebb's Willow (Salix bebbiana): 1975-1979.
Black Locust (Robinia pseudo-acacia): 1975-1979.

Bog Clubmoss (Lycopodiella inundata): 1975-1979; obs. 7 June 1979; Cryan (1980); 26 July 2003 [an important species].
Broad-leaved Cattail (Typha latifolia): obs. 7 June 1979.
Bulrush (Scirpus microcarpus) [= S. rubrotinctus]: 1975-1979.
Canada Mayflower (Maianthemum canadense) 1975-1979; obs. 7 June 1979.
Common Rush (Juncus effusus): 1975-1979.
Cottonwood (Populus deltoides): 1975-1979.
*Crown Vetch (Coronilla varia): 30 May 2003.
*Field Cress (Lepidium campestre): 31 May 2003.
Frostweed (Helianthemum canadense): 1975-1979; obs. 7 June 1979 [an important species].
Grey Birch (Betula populifolia): 1975-1979.
Hairgrass (Eleocharis acicularis): 1975-1979; obs. 7 June 1979.
Large-toothed Aspen (Populus grandidentata): 1975-1979.
Little Bluestem (Schizacyrium scoparium): 30 May 2003 [an important species].
Maiden Pink (Dianthus deltoides): 1975-1979.
Maple-leaved Viburnum (Viburnum acerifolium): 1975-1979; obs. 7 June 1979.
Marsh Fern (Thelypteris palustris): 1975-1979.
New Jersey Tea (Ceanothus americanus): 26 July 2003 [an important species].
Oldfield Cinquefoil (Potentilla simplex): 29 May 2006.
Pipsissewa (Chimaphila umbellata): 1975-1979; obs. 7 June 1979 [an important species].
Pitch Pine (Pinus rigida): 1975-1979 [an important species].
*Purple Loosestrife (Lythrum salicaria): 26 July 2003.
Round-leaved Sundew (Drosera rotundifolia): 1975-1979; obs. 7 June 1979; Cryan (1980); 26 July 2003 [an important species].
Sedge (Carex scoparia): 1975-1979.
Sensitive Fern (Onoclea sensibilis): 1975-1979.
Spotted Horsemint (Monarda punctata): 30 May 2003, new leaves & 2002 stalks; 26 July 2003, in bloom, nectar source for Karner Blue [an important species].
*Spotted Knapweed (Centaurea maculosa): 26 July 2003.
Swamp Candles (Lysimachia terrestris): Cryan (1980).
Sweetfern (Comptonia peregrina): 1975-1979; 30 May 2003 [an important species].
Trembling Aspen (Populus tremuloides): 1975-1979.
Tussock Sedge (Carex stricta): 26 July 2003 [an important species].
Variegated Horsetail (Equisetum variegatum): 1975-1979; obs. 7 June 1979 [an important species].
Wild Lupine (Lupinus perennis): 1975-1979; obs. 7 June 1979; 30 May 2003, perhaps 1000 plants in full bloom! [an important species]
*Yellow Hawkweed, King Devil (Hieracium caespitosum) [= H. pratense]: 1975-1979.
*Yellow Rocket (Barbarea vulgaris): 31 May 2003.

LICHENS

Common Reindeer Lichen (Cladina rangiferina): 1975-1979.
British Soldiers (Cladonia cristatella): 1975-1979.
Pagoda Lichen (Cladonia verticillata): 1975-1979.
Oyster Lichen (Hypocenomyce scalaris): On Pinus rigida. 7 June 1979.
Furrowed Shield Lichen (Parmelia sulcata): 1975-1979.
Sandy Foam Lichen (Stereocaulon condensatum): 1975-1979; still there on 26 July 2003 [an important species].

FUNGI

Earth Star Mushroom (Astraeus hyrometricus): 1975-1979 [an important species].

BIRDS

Spotted Sandpiper (Actitis macularia): obs. 7 June 1979.
Belted Kingfisher (Megaceryle alcyon): 1975-1979 (nesting in sand bank) [an important species].
Red-winged Blackbird (Agelaius phoeniceus): obs. 7 June 1979.
Bank Swallow (Riparia riparia): 1978, nesting colony on N sand slope [an important species].

BUTTERFLIES & MOTHS

Silver-spotted Skipper (Epargyreus clarus): 26 July 2003, nectaring at *Purple Loosestrife.
Juvenal's Duskywing (Erynnis juvenalis): 30-31 May 2003, nectaring at Wild Lupine; 29 May 2006.
Dreamy Duskywing (Erynnis icelus): 30-31 May 2003, apparently associated with Large-toothed Aspen as larval foodplant, nectaring at Wild Lupine; 29 May 2006.
Wild Indigo Duskywing (Erynnis baptisiae): 31 May 2003, in *Crown Vetch patch (its larval hostplant); 26 July 2003, nectaring at *Spotted Knapweed & *Purple Loosestrife; 29 May 2006.
*European Skipper (Thymelicus lineola): 26 July 2003.
Hobomok Skipper (Poanes hobomok): 29 May 2006.
Mulberry Wing (Poanes massasoit): 26 July 2003, larvae associated with Tussock Sedge (Carex stricta) [an important species].
Dun Skipper (Euphyes vestris metacomet): 26 July 2003.
Cobweb Skipper (Hesperia metea): 30 May 2003, a nice colony of this rare species, associated with Little Bluestem as larval foodplant [an important species].
Common Roadside Skipper (Amblyscirtes vialis): 31 May 2003 [an important species].
American Copper (Lycaena phlaeas americana): 31 May 2003.
Frosted Elfin (Incisalia irus): 30-31 May 2003 [an important species].

Karner Blue (Lycaeides melissa samuelis): 1975-1979; 30 May 2003, associated with Wild Lupine as larval hostplant; 26 July 2003, nectaring at Spotted Horsemint; 29 May 2006, fresh male [an important species].

Northern Silvery Blue (Glaucopsyche lygdamus couperi): 30 May 2003, apparently associated with *Crown Vetch (Coronilla varia), an unrecorded larval foodplant, nectaring at *Field Cress, *Yellow Rocket, & tall Arabis sp.; 29 May 2006, adults.

Eastern Tailed Blue (Everes comyntas): 26 July 2003; 29 May 2006, nectaring at Oldfeld Cinquefoil (Potentilla simplex).

*Cabbage White (Pieris rapae): 26 July 2003; 29 May 2006.

Clouded Sulphur (Colias philodice): 31 May 2003; 26 July 2003, nectaring at Spotted Horsemint.

Great Spangled Fritillary (Speyeria cybele): 26 July 2003.

Pearl Crescent (Phyciodes tharos): 31 May 2003, nectaring at *Yellow Rocket; 26 July 2003; 29 May 2006.

Compton Tortoiseshell (Roddia vaualbum = Nymphalis vaualbum j-album): 26 July 2003, fresh male.

American Painted Lady (Vanessa virginiensis): 26 July 2003, nectaring at *Purple Loosestrife.

Red Admiral (Vanessa atalanta): 26 July 2003.

Viceroy (Limenitis archippus): 26 July 2003.

Red-spotted Purple (Limenitis arthemis astyanax): 26 July 2003.

Common Wood Nymph (Cercyonis pegala): 26 July 2003.

Eyed Brown (Satyrodes eurydice): 26 July 2003.

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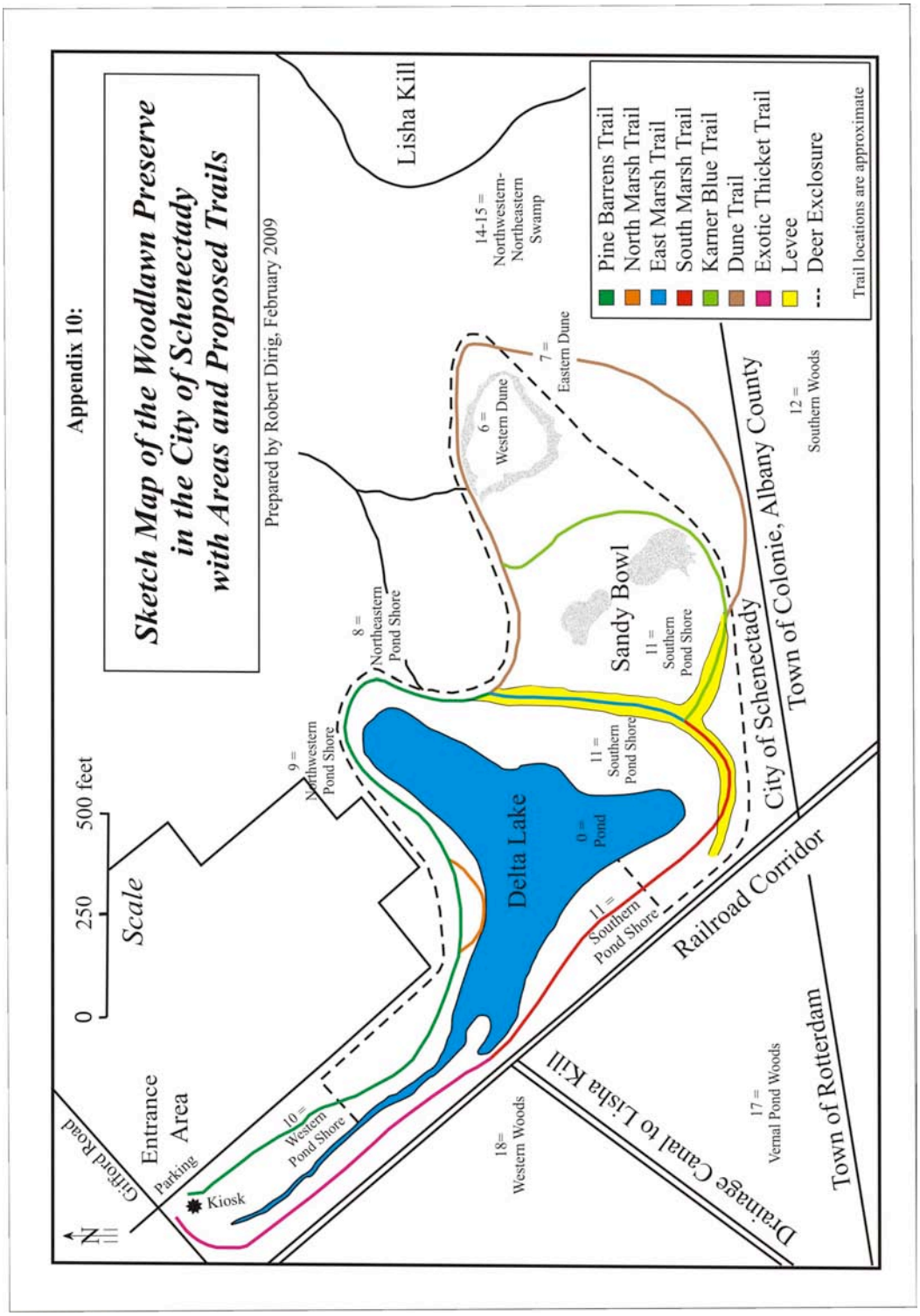
*Gypsy Moth (Lymantria dispar): 26 July 2003, patrolling males.

Hummingbird Clearwing Sphinx [moth] (Hemaris thysbe): 26 July 2003, nectaring at *Purple Loosestrife.

Appendix 10:
Sketch Map of the Woodlawn Preserve with Proposed Trails



Appendix 11
Native Plants
Characteristic of Pine Barrens

at the

Woodlawn Preserve

City of Schenectady,
Schenectady County, New York

Compiled by Robert Dirig

P = Pine Barrens Trail, D = High Dunes & Sandy Bowl, W = Wetland Species

American Dewberry (Rubus flagellaris): P, D
American Hazelnut (Corylus americana): P
Big Bluestem (Andropogon gerardii): D
Black Cherry (Prunus serotina): P
Black Huckleberry (Gaylussacia baccata): W
Blue Wood Aster (Aster cordifolius): D
Bluecurls (Triostema dichotomum): D
Bracken Fern (Pteridium aquilinum): D
Bush Clover (Lespedeza capitata): P, D
Buttonbush (Cephalanthus occidentalis): W
Canadian Tick Trefoil (Desmodium canadense): P, D
Early Sweet Blueberry (Vaccinium pallidum): D
Grey Birch (Betula populifolia): P
Highbush Blueberry (Vaccinium corymbosum): W
Leatherleaf (Chamaedaphne calyculata): W
Little Bluestem (Schizachyrium scoparium): P, D
Lowbush Bluberry (Vaccinium angustifolium): D
New Jersey Tea (Ceanothus americanus): D
Pipsissewa (Chimaphila umbellata): D
Pitch Pine (Pinus rigida): [P], D
Sand Rush (Bulbostylis capillaris): W
Sand Violet (Viola fimbriatula): D
Scrub Oak (Quercus ilicifolia): D
Slender Willow (Salix petiolaris): W
Smooth Alder (Alnus serrulata): W
Smooth Sumac (Rhus glabra): P
Speckled Alder (Alnus incana rugosa): W
Spotted Horsemint (Monarda punctata): P, D
Swamp Milkweed (Asclepias incarnata): W
Sweetfern (Comptonia peregrina): P, D
Switchgrass (Panicum virgatum): P
Tussock Sedge (Carex stricta): W
Whorled Loosestrife (Lysimachia quadrifolia): P, D
Wild Lupine (Lupinus perennis): P, D
Winged Pigweed (Cycloloma atriplicifolium): D
Winged/Dwarf Sumac (Rhus copallina): P

Appendix 12:

Karner Blue
(Lycaeides melissa samuelis)
Nectar Sources and Other Adult Feeding

Compiled by Robert Dirig, 1973-2008

All records are from the Albany Pine Bush, Saratoga Sites, & Glens Falls Sand Plain.
* = naturalized plants. Number of observations indicates frequency of use by Karner Blues.

SPRING BROOD:
Rue Anemone (Anemonella thalictroides): 1 obs.
Wild Strawberry (Fragaria virginiana): 3 obs.
Sand Cherry (Prunus pumila susquehannae): 2 obs.
Wild Lupine (Lupinus perennis): 5 obs.
Black Huckleberry (Gaylussacia baccata): 2 obs.
Cinquefoils (Potentilla simplex/P. canadensis): 7 obs.
American Dewberry (Rubus flagellaris): 8 obs.
Lowbush Blueberry (Vaccinium angustifolium): 1 obs.

LATE SPRING BROOD/EARLY SUMMER BROOD:
*Mouse-eared Chickweed (Stellaria vulgatum): 1 obs.
*Common Stitchwort (Stellaria graminea): 1 obs.
*Yellow Hawkweed, King Devil (Hieracium caespitosum): 8 obs.
*Maiden Pink (Dianthus deltoides): 3 obs.
*Birdsfoot Trefoil (Lotus corniculata): 2 obs.
*Oxeye Daisy (Leucanthemum vulgare): 1 obs.
Bastard Toadflax (Comandra umbellata): 1 obs.
Spreading Dogbane (Apocynum androsaemifolium): 1 obs.
*Red Clover (Trifolium pratense): 1 obs.
New Jersey Tea (Ceanothus americanus): 1 obs.
Thimbleweed (Anemone cylindrica): 1 obs.
Common Milkweed (Asclepias syriaca): 5 obs.

SUMMER BROOD:
Lesser Daisy Fleabane (Erigeron strigosus): 8 obs.
*Common Yarrow (Achillea millefolium): 1 obs.
*White Sweet Clover (Melilotus alba): 31 obs.
Butterfly Milkweed (Asclepias tuberosa): 51 obs.
Round-leaved Sundew (Drosera rotundifolia): 5 obs.
*Spotted Knapweed (Centaurea maculosa): 14 obs.

*Hoary Alyssum (Berteroa incana): 1 obs.
Smooth Sumac (Rhus glabra): 1 obs.
White-topped Aster (Aster paternus): 2 obs.
Spotted Horsemint (Monarda punctata): 28 obs.
Blue Vervain (Verbena hastata): 3 obs.
*Bouncing Bet, Soapwort (Saponaria officinalis): 2 obs.
*Purple Loosestrife (Lythrum salicaria): 1 obs.
[cultivated] Ageratum (Ageratum sp., cv. 'Blue Tango'): 1 obs.

MISCELLANEOUS FEEDING (BOTH BROODS):
puddling: 49 obs.
at dung: 14 obs.
at birdlime: 1 obs.
at carrion: 1 obs.
at human perspiration: 5 obs.
drinking water from “wells” in centre of Lupine leaf: 1 obs.

Appendix 13:

Habitats and Larval Foodplants
of Schenectady Butterflies

[* = naturalized butterflies and plants]

Skippers, Family Hesperiidae

Silver-spotted Skipper: General in open areas. Larvae usually on Black Locust, historically on Canadian Tick-Trefoil here.

Hoary Edge: Partially shaded wooded edge habitats and trails. Larvae on Canadian Tick-trefoil.

Southern Cloudywing: Open sandy areas, adults hilltop on dune crests. Larvae on Canadian Tick-trefoil.

Northern Cloudywing: Open sandy areas, adults hilltop on dune crests. Larvae on *clovers and Canadian Tick-Trefoil.

Dreamy Duskywing: Open sandy, seepy areas. Larvae on willows (Salix tristis) and poplars.

Juvenal's Duskywing: Openings in pine barrens and oak woods. Larvae on Scrub Oak, other oaks.

Mottled Duskywing: Sand trails and openings, adults hilltop on dune crests. Larvae on New Jersey Tea.

Common Sootywing: Open, disturbed sand with weedy Pigweeds and Chenopods, the larval foodplants.

Least Skipper: Marshy fringes of ponds or ditches, flying through emergent plants. Rice Cutgrass and Reed Canary Grass are common larval hosts.

*European Skipper: Generally common in open areas. Larvae on *Timothy and other grasses.

Leonard's Skipper: Open lanes near streams. Caterpillars on grasses (Little Bluestem, Big Bluestem, & Switchgrass are likely hosts here).

Cobweb Skipper: Open sandy areas and trails. Larvae on Little Bluestem.

Indian Skipper: Open sandy are brushy areas. Larvae on grasses.

Peck's Skipper: Marshy areas near wetlands. Larvae on grasses.

Tawny Edge: General dry pine barrens. Larvae on grasses.

Cross-line Skipper: Dry edges of marshes. Larvae on grasses.

Long Dash: Marshes, especially with Blue Flag iris for nectar. Larvae on grasses.

Northern Broken Dash: General in drier open areas. Larvae on grasses.

Little Glassywing: Dry open areas with grasses (larval foodplants). Adults usually seen on Common Milkweed flowers.

Delaware Skipper: Edges of marshes and fens. Larvae on grasses and sedges.

Mulberry Wing: In marshes and fens with Tussock Sedge, the larval foodplant.

Hobomok Skipper: General in wetter open areas. Larvae on grasses.

Broad-winged Skipper: Weedy areas with *Common Reed (Phragmites australis), the larval hostplant.

Dion Skipper: Marshes and fens with Lake Sedge, the larval host.

Black Dash: Marshes and fens. Larvae on sedges.

Dun Skipper: In fens, marshes, and nearby uplands. Larvae on sedges.

Dusted Skipper: Open sandy areas and trails. Larvae on Little/Big Bluestems.

Roadside Skipper: Sandy open areas and trails. Larvae on grasses (Big Bluestem here?).

Swallowtails, Family Papilionidae

Eastern Black Swallowtail: Open areas, marshes; adults hilltop on dune crests. Larvae on Queen Anne's Lace and other umbellifers.

Tiger Swallowtail group: Edges of woods and adjacent open areas. Larvae usually on ash and cherry.

Spicebush Swallowtail: Dry trails and woodland edges near Sassafras, or wetlands with Spicebush, the larval hosts.

Whites & Sulphurs, Family Pieridae

*Cabbage White: Open areas everywhere. Larvae on many mustards.

Clouded Sulphur: Open areas and barrens. Larvae mostly on *clovers, perhaps historically on Canadian Tick-trefoils and Bush Clovers.

Alfalfa Butterfly: Open areas. Larvae mostly on *clovers and *vetches.

Gossamer-winged Butterflies, Family Lycaenidae

Harvester: Seepy sand trails near fens with alders. Larvae eat Woolly Alder Aphids on Alder trunks and branches.

American Copper: Hot, dry sandy trails and openings. Larvae on *Sheep Sorrell.

Coral Hairstreak: Open barrens, often nectaring at Butterfly Milkweed. Larvae on cherries.

Acadian Hairstreak: Fens and interdune low area. Larvae on willows (Salix humilis, S. petiolaris).

Edwards' Hairstreak: Open barrens, often landing and perching on Scrub Oak, the larval host.

Banded Hairstreak: Barrens, often nectaring at Common Milkweed and New Jersey Tea. Larvae on oaks.

Hickory Hairstreak: Habitat similar to preceding. Larvae on hickories.

Striped Hairstreak: Open lanes through wetlands with Highbush Blueberries, a larval foodplant.

Brown Elfin: Sand trails and open areas near Lowbush Blueberries, the larval hosts.

Frosted Elfin: Sandy areas with Wild Lupine, the larval foodplant.

Eastern Pine Elfin: Sandy lanes with sapling Pitch Pines, the larval hostplant.

Gray Hairstreak: Pine barrens with Canadian Tick-Trefoil, a caterpillar hostplant.

Eastern Tailed Blue: Sandy lanes with Canadian Tick-Trefoil, a larval host.
Spring Azure group [3+ spp.]: General in open areas, especially near water; ravines. Larval hosts include dogwoods, viburnums, and other shrubs with clustered white flowers.

Summer Azure: Sandy lanes, brushy marshes and fens. Caterpillars on Meadowsweet.

Karner Blue: Open sand with Wild Lupine, its only larval hostplant.

Brush-footed Butterflies, Family Nymphalidae

Great Spangled Fritillary: Open areas at the edge of marshes. Larvae on violets.

Aphrodite Fritillary: Drier open areas. Larvae also on violets.

Silvery Checkerspot: Open sandy areas. Larvae on wild sunflowers, less often asters.

Harris' Checkerspot: Brushy fens. Larvae on Flat-topped White Aster, its only host.

Pearl Crescent: Open weedy areas and sandy trails. Larvae on asters.

Baltimore Checkerspot: Marshes and fens with Turtlehead, its larval host.

Questionmark: Wetlands and their edges. Larvae on elm and nettle.

Eastern Comma: Shaded areas with nettles, the larval hosts.

Mourning Cloak: Ravines and marshes. Larvae on willows.

American Painted Lady: Open areas. Caterpillars on Pearly Everlasting, Sweet Everlasting.

Cosmopolitan Painted Lady: General in open weedy areas. Larvae on thistles.

Red Admiral: General at edges of woods. Caterpillars on Stinging Nettle, Wood Nettle, and False Nettle.

Banded/Red-spotted Purples (intergrades): Sandy lanes through woods in wetter areas. Larvae on birch and cherry

Viceroy: Marshes and brushy fens. Larvae on willows and poplars.

Satyrs & Wood Nymphs, Family Satyridae

Northern Pearly Eye: Lanes near ravines and other shaded wetlands. Larvae on Whitegrass.

Eyed Brown: Sunny marshes and fens. Larvae on Tussock Sedge, Lake Sedge.

Appalachian Brown: Shady edges of marshes and fens. Larvae on sedges.

Little Wood Satyr: Brushy barrens. Larvae on grasses.

Inornate Ringlet: Trails, open areas. Larvae on grasses.

Common Wood Nymph: Bushy barrens. Larvae on grasses.

Monarchs, Family Danaidae

Monarch: General in open areas, often at flowers or around the milkweed larval hosts.

Foodplant Summary (in alphabetical order)

*Clovers: Northern Cloudywing, Clouded Sulphur.
*Common Reed: Broad-winged Skipper.
*Timothy: *European Skipper.
Amaranths: Common Sootywing.
Ash: Tiger Swallowtail.
Aster: Silvery Checkerspot, Pearl Crescent.
Big Bluestem: Leonard's Skipper, Dusted Skipper, Common Roadside Skipper.
Birch: Banded/Red-spotted Purple.
Black Locust: Silver-spotted Skipper.
Bush Clover: Clouded Sulphur, Grey Hairstreak.
Canadian Tick-Trefoil: Silver-spotted Skipper, Hoary Edge, Southern & Northern Cloudywings, Clouded Sulphur, Gray Hairstreak, Eastern Tailed Blue.
Cherry: Tiger Swallowtail, Coral Hairstreak, Banded/Red-spotted Purple.
Dogwood: Spring Azure.
Elm: Questionmark.
False Nettle: Red Admiral.
Flat-topped White Aster: Harris' Checkerspot.
Grasses: *European Skipper, Indian Skipper, Peck's Skipper, Tawny Edge, Cross-line Skipper, Long Dash, Northern Broken Dash, Little Glassywing, Delaware Skipper, Hobomok

Skipper, Common Roadside Skipper, Little Wood Satyr, Inornate Ringlet, Common Wood Nymph.

Hickory: Hickory Hairstreak.
Highbush Blueberry: Striped Hairstreak.
Lake Sedge: Dion Skipper, Eyed Brown.
Little Bluestem: Leonard's Skipper, Cobweb Skipper, Dusted Skipper.
Lowbush Blueberry: Brown Elfin.
Meadowsweet: Summer Azure.
Milkweed: Monarch
Mustards: *Cabbage White.
Nettle: Questionmark, Eastern Comma.
New Jersey Tea: Mottled Duskywing.
Oaks: Juvenal's Duskywing, Banded Hairstreak.
Pearly Everlasting: American Painted Lady.
Pigweed: Common Sootywing.
Pitch Pine: Eastern Pine Elfin.
Poplar: Viceroy.
Queen Anne's Lace: Eastern Black Swallowtail.
Reed Canary Grass: Least Skipper.
Rice Cutgrass: Least Skipper.
Salix humilis: Acadian Hairstreak, Viceroy.
Salix petiolaris: Acadian Hairstreak, Viceroy.
Salix tristis: Dreamy Duskywing, Viceroy.
Sassafras: Spicebush Swallowtail.
Scrub Oak: Juvenal's Duskywing, Edwards' Hairstreak.
Sedges: Delaware Skipper, Black Dash, Dun Skipper, Appalachian Brown.
Sheep Sorrel: American Copper
Spicebush: Spicebush Swallowtail.
Stinging Nettle: Questionmark, Eastern Comma, Red Admiral.
Sweet Everlasting: American Painted Lady.
Switchgrass: Leonard's Skipper.
Thistles: Cosmopolitan Painted Lady.
Turtlehead: Baltimore Checkerspot.
Tussock Sedge: Mulberry Wing, Eyed Brown.
Umbellifers: Eastern Black Swallowtail.
Viburnum: Spring Azure.
Violets: Great Spangled Fritillary, Aphrodite Fritillary.
Whitegrass: Northern Pearly Eye.
Wild Lupine: Karner Blue, Frosted Elfin.
Wild Sunflower: Silvery Checkerspot.
Willows: Dreamy Duskywing, Acadian Hairstreak, Mourning Cloak, Viceroy.
Wood Nettle: Red Admiral.
Woolly Aphids on Alder: Harvester.

Habitat Summary

Open Areas: Silver-spotted Skipper, Southern & Northern Cloudywings, *European Skipper, Cobweb Skipper, Indian Skipper, Northern Broken Dash, Little Glassywing, Hobomok Skipper, Dusted Skipper, Common Roadside Skipper, E. Black Swallowtail, *Cabbage White, Clouded Sulphur, Alfalfa Butterfly, American Copper, Edwards' Hairstreak, Banded Hairstreak, Hickory Hairstreak, Frosted Elfin, Eastern Pine Elfin, Gray Hairstreak, Eastern Tailed Blue, Spring Azure, Summer Azure, Karner Blue, Aphrodite Fritillary, Silvery Checkerspot, Pearl Crescent, American Painted Lady, Cosmopolitan Painted Lady, Little Wood Satyr, Inornate Ringlet, Common Wood Nymph.

Wooded Edges & Trails: Hoary Edge, Dreamy Duskywing, Tawny Edge, Tiger Swallowtail. Spicebush Swallowtail, Brown Elfin, Eastern Comma, Red Admiral, Banded/Red-spotted Purple, Northern Pearly Eye.

Hilltopping on Dune Crests: Southern & Northern Cloudywings, Mottled Duskywing, Leonard's Skipper, Eastern Black Swallowtail, Banded/Red-spotted Purple.

Areas with Seepy Sand: Dreamy Duskywing, Harvester, Eastern Pine Elfin.

Openings in Pine Barrens & Oak Woods: Hoary Edge, Juvenal's Duskywing, Mottled Duskywing, Coral Hairstreak.

Disturbed Sand: Common Sootywing.

Wet Ditches: Least Skipper.

Edges of Ponds: Least Skipper, Cross-line Skipper, Delaware Skipper, Mulberry Wing, Black Dash, Hobomok Skipper, Broad-winged Skipper, Pearl Crescent, Questionmark.

Elevated Open Areas Near Streams: Leonard's Skipper.

Marshes & Fens: Peck's Skipper, Long Dash, Delaware Skipper, Mulberry Wing, Dion Skipper, Black Dash, Dun Skipper, Eastern Black Swallowtail, Harvester, Acadian Hairstreak, Summer Azure, Great Spangled Fritillary, Harris' Checkerspot, Baltimore Checkerspot, Mourning Cloak, Red Admiral, Viceroy, Eyed Brown.

Ravines: Mourning Cloak, Red Admiral, Northern Pearly Eye.

Shaded Wet Ecotones: Appalachian Brown, Northern Pearly Eye.

Appendix 14

PROPAGATION RECOMMENDATIONS

FOR THE

SCHENECTADY PINE BUSH DUNE COMPLEX

IN THE WOOD LAWN PRESERVE

PREPARED BY

KRISSY BOYS FAUST
ROSEMARIE PARKER

JANUARY 2011

List of Plants:

Andopogon gerardii Big Blue Stem

Asclepias tuberosa Butterfly Weed

Ceanothus americanus New Jersey Tea

Desmodium canadense Canadian Tick Trefoil

Lespedeza capatata Bush Clover

Lupinus perennis Wild Blue Lupine

Monarda punctata Spotted Horse Mint

Pinus rigida Pitch Pine

Salix humilis var. *tristis* Dwarf Prairie Willow

Schizachyrium scoparium Little Blue Stem

Quercus ilicifolia Bear Oak

Native Plant Propagation by Seed
Rules of Thumb

Golden Rules

Always get permission from the land-owner.
Never harvest more than 10% of the seed, nor all from one plant.
Don't harvest from rare, parasitic, mycorrhizal dependent, or very site specific plants (e.g. orchids, wood betony, gorge cliff dwellers).
Be patient. Native plants can take more than one year to germinate.

Seed Treatment

Berry-like: Keep moist, remove the pulp and store in slightly moist potting soil, sand, or vermiculite. Or plant directly outside after removing pulp.
Eliasomes (looks like a root starting to poke out of the seed): Keep moist, store immediately in slightly moist potting soil, sand or vermiculite.
Spring bloomers, especially ephemerals: Will need to mimic natural conditions. Warm/moist, then cool/moist, then warm/moist and they will germinate. If you put them directly into the refrigerator after harvest, and bring them out the following spring, it may take 2 years to complete the cycle.
Sunny, late-summer to fall bloomers: Frequently need minimal treatment. Dry storage is usually OK. Cool/moist treatment never hurts, or can sow directly outside.
Very hard coated seeds: scarify (rub with sandpaper) and/or soak in several changes of water for 24-48 hours.
Teeny seeds: Do not cover with soil; they may need light to germinate. Covering lightly with sand is OK as it lets light through.
Always cover very lightly (sprinkle) as even some large seeds need light to germinate.

When to Harvest

When stem below seed head turns brown
When berries look ripe (or just before so you beat the critters)
If seeds drop off easily when brushed
Spring ephemerals are ready in June.

Key References

1. Cullina, William, Wildflowers: A Guide to Growing and Propagating Native Flowers of North America (The New England Wild Flower Society), Houghton Mifflin Harcourt, 2000

2. Cullina, William, Native Trees, Shrubs, and Vines: A Guide to Using, Growing, and Propagating North American Woody Plants, Houghton Mifflin Harcourt, 2002

3. Cullina, William, Native Ferns, Moss, and Grasses: From Emerald Carpet to Amber Wave, Serene and Sensuous Plants for the Garden, Houghton Mifflin Harcourt, 2008

Care of Native Plant Seedlings

Krissy Boys Faust

Light: I do not use artificial lighting for seedling germination. Native plant seeds germinate well on a green house bench or in a cold frame under natural light.

Watering: When watering seedlings, do not use high pressure hose heads on seedling bed or flats. Instead water only from directly above using light pressure until plants establish the ability to hold themselves in the flats and pots. As the seedlings get larger, decrease the frequency of watering, allowing the soil to become dry/nearly dry between watering. Most seedling loss is due to watering, both over and under watering.

Temperature: Most seeds germinate at 70˚F. Warm season grasses are an exception; they will germinate at 70˚F but will give a better germination rate at temperatures around 80˚-85˚F.

Fertilizer: (for non-woody plants and unless otherwise specified) It is best to use little or no fertilizer for the first 2-3 weeks after germination. If you are using a prepared mix, there is often some fertilizer already (e.g. Pro-Mix). Later, a light feeding of fish emulsion, compost tea, or a water soluble mix of 21-5-20 will grow your seedlings into healthy plugs. The latter fertilizer was successfully used here at half strength (150 ppm instead of the recommended 300 ppm) and was added to the watering regimen once per week with a dositron that meters the correct amount through the hose.

††**Inoculum:** Inoculum is recommended for some plants, especially legumes. Mix with seeds at time of sowing, moist stratification or when planting out. For the latter, place some in the hole in which you plant the plug. You can buy species specific inoculum from Prairie Moon Nursery. It is available in the catalog for sale in amounts from small packets to pounds and typically is viable for a year. (Toll Free - 866-417-8156 or online at www.prairiemoon.com.)

***Potting Soil:** Use Pro-Mix or something similar. Pro-Mix is a peat based soilless mix. I use potting mix for all purposes, never **seed** mix, which is too fine and gets waterlogged**.** Given your sandy soil**, you should probably provide a better draining medium** to minimize the shock of final transplanting. Your growing medium or potting mix should be a 2:1 ratio of soilless mix to sand or fine poultry grit (Cullina 2002)**.**

Seed Bed: You may choose to plant into a prepared bed outside to conserve interior space. If so, seeds would be planted in the fall, without scarification (even if called for otherwise). Choose a weed-free area and protect from predators. Mulch lightly with fine leaf mold or sawdust mixed with sand. Recommendations for inoculum, growing on, and final planting out remain essentially unchanged.

Broadcasting/Direct Sowing: For very high volume plantings, or if volunteer labor is limited, direct sowing is a viable option. In general, you will get bigger plants faster with plugs, and the planting area will fill in faster. Because you have more control over environmental conditions with pots or beds, the results are less dependent on weather patterns. Adverse weather can limit the success of a broadcast area, and each species will respond differently, resulting in a patchy planting.

Direct sowing is done from late fall through early spring, but is best during a mid-winter thaw. Collect, and clean seeds as described in the species protocol. Mix seeds into fine sawdust in a bucket or open weave bag. Store in a cool area (~40˚F) until sown. None of the seeds in the current list require long cold/moist stratification, thus even early spring planting will provide a long enough stratification period. If, in the future, you are sowing seeds that call for 30-90 days of cold/moist stratification, then you must either broadcast in fall or early winter, or lightly moisten the sawdust mix to stratify in cold storage. The latter risks germination in the bucket, thus less ability to survive broadcasting.

To broadcast, lightly moisten the sawdust mix so that the seeds stick to the sawdust. Rake any heavy leaf cover so the seeds can directly contact the soil. Spread the sawdust mix over the intended planting area and press in (e.g. by walking over the area). For large seeds like acorns, dibble 1-2 inch deep holes, drop in the seed and cover with soil. Plant 2-3 times the desired density to allow for predation and poor viability. Broadcast sites may need supplemental watering the first season.

Containers: Flats and pots differ wildly. Begin with open trays (no divisions) or cell flats that produce seedlings at approximately 3/8-1/2 inch apart (usually 50 cells to a tray). From this size, move the seedlings up to individual pots (see below). Try to "pot up" or increase the size of the container to 2 inches diameter beyond root size (no more or less). A cell flat will grow a seedling that should move directly up to a 3-4 inch pot.

You may want to try "root trainers" for the woody plants. These are rigid containers with internal vertical ribs, that direct roots straight down to prevent spiral growth. The containers are set on frames or beds above the ground to allow air-pruning of roots as they emerge from the containers. The latest developments also encourage lateral air root pruning through vertical slits. Seedlings grown in root trainers have more vigorous and rapid root growth than seedlings grown in polybags. Importantly, long-term survival is much better. Plants grown in root trainer systems are often ready for planting out when they are substantially smaller than those from conventional polybags. This helps to reduce space. If you choose the root trainer system, you may need to adapt other nursery practices to the special requirements of the system. It is important to choose a potting substrate that is fibrous so that it does not fall through the bottom holes of the containers. Sand and soil or mixtures that contain a lot of sand or soil are not suitable (Jaenicke 1999).

Potting Up Seedlings: Begin by testing for the correct pot size with a seedling in one hand and an empty container in the other. If the plant fits and there is an inch of growing space on all sides, the pot is the correct size. Clip some roots off if necessary to avoid coiling them in the bottom. Fill containers to about ••• inch below the surface of the pot and dibble a hole in the center of the mix. When lifting the seedling to transplant hold the plant by the leaves or cotyledons. Place the seedling in the center hole and tamp gently from the outside edges of the pot to the inside edge of the stem of the plant. The

seedling should be at the same soil level as prior to transplanting. Tap the pot a few times and look to see if the soil mix is at the right level and then adjust if necessary. Water soon after transplanting and keep shaded for at least a day.

†**Shading:** Shading material can be anything that will block some sunlight while letting air and water through. Floating row cover material (e.g. REMAY) works well for large areas that may need covering all at once. For small sections or single plants, I turn over open weave flat bottoms. Lath covers are easy to make. Build them with 2x4 lumber as the frame and strips of lath. A 1-inch spacing between laths will reduce the sunlight to somewhere between 30- 40%, an ideal amount. I use 5 gallon buckets to hold lath panels above pots and flats (see cover photo).

Labeling: Label everything well. Label individual pots if there are only few. Label whole flats the same species once. If you mix species in one flat, label each species at both beginning and end of each row of pots. Labels should contain the following information: Genus, species, collection date & location, and sow date.

Outplanting: Non-woody plants can usually be planted out their first season. Woody plants are generally kept in pots (overwintered in a cold-frame) or the seed bed for 1-2 years before planting in their final location. When you decide to outplant be prepared to keep the plants moist at all times during the planting process. The day may start out cool and moist but turn sunny and dry. Try not to outplant on windy days. Cover plants with wet tarps of canvas or open weave plastic (light color & breathable) - not black plastic. Carry individual seedlings to plant in buckets and or **weed bags** (soft bags made from feed sack material that are easy to keep moist without holding water). Bring water into the field to water in as you transplant or soon after. Shade seedling transplants as needed. **Remember to water as needed throughout the first season of establishment**.

References:

1. Cullina, William, 2002, Native Trees, Shrubs, and Vines: A Guide to Using, Growing, and Propagating North American Woody Plants, Houghton Mifflin Harcourt, New York.

2. Jaenicke, H. 1999, GoodTree NurseryPractices: Practical Guidelines for Research Nurseries, International Centre for Agroforestry, Majestic Printing Works, Nairobi, Kenya.

Andropogon gerardii
Big Blue Stem

This species does not transplant easily from divisions. Propagate by seed.

Seed collecting: Seeds ripen in the fall anywhere from October to mid-November. Hand collect by stripping the seeds off the stems. When the seeds are ripe, they easily break free from the dried inflorescence and fall into your palm. Keep a paper bag handy to hold them as you collect.

Seed treatment: Dry seeds in the bag for 2-5 days and store in cool area in glass or metal containers until ready to sow.

Sowing: (middle- end February) Place seeds on top of potting soil* and cover lightly with coarse grit, sand, or more potting mix. The best transplanting results are from cell flats or pots. Water and keep moist at a temperature of 70°-85°F.

Growing on: Germinates in 2-3 weeks at 70°-85°F. Maintain moisture, light and warmth. . Keep seedling flats moist until germination, then as dry as possible; let them dry out fully before watering. Do not fertilize. This plant likes warm temperatures. Do not put outdoors until temperature is around 60°-70°F during the day.

Outplanting: Can be planted outside in mid-May to early June. Plant out no later than June 7 or the heat may become too severe even with watering. Provide shading† in case of early heat wave soon after planting out. Maintain watering during first summer.

* See Potting Soil in introductory section on seedling care.

† See Shading in introductory section on seedling care.

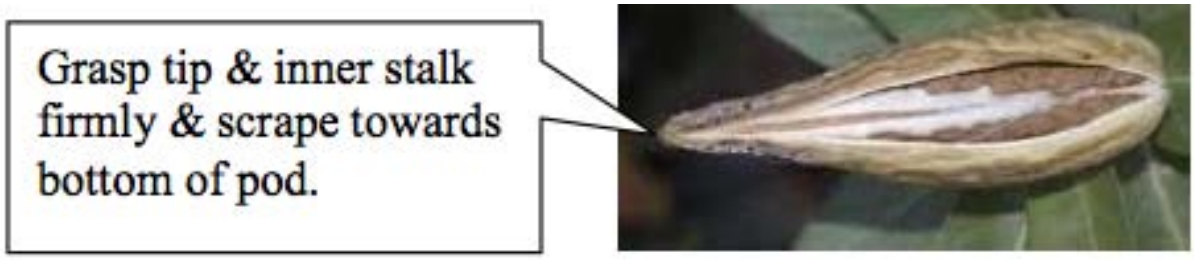
References:

1. Faust, Krissy Boys, personal experience.
2. Prairie Moon Nursery Catalog& Cultural Guide (2005).

Asclepias tuberosa
Butterfly Weed

This species has a long tap root and resents disturbance once established. Propagate by seed.

Seed Collecting: Seeds are ripe when pod begins to split. It is important to collect the pods before they open and clean seeds immediately in the field. Easy seed cleaning technique: hold the pod at the tip, clamped between thumb and forefinger – scrape seeds off of white pappas directly into paper bag, leaving the fluffy pappas with the pod.



Seed Treatment: Let dry in paper bag. Do not put in jars or tins until fully dry. Store in refrigerator (airtight container) or cold room (paper bag) until sown.

Sowing: (middle-end February) Place seed on top of potting soil*. Asclepias species need light to germinate. Cover lightly with sand so light can penetrate. Water and keep moist at 70°.

Growing on: Germinates in 2-3 weeks. Maintain moisture, light, and warmth. Keep seedling flats moist until germination, then as dry as possible; let them dry out fully before watering. Do not fertilize for 2-3 weeks. Within 6-8 weeks pot up seedlings in 3″ pots. When temperatures are consistently into the 50's during the day, and above freezing at night, harden off by putting in a cold frame and/or protected location for a few hours each day. Increase exposure each day for 5 days and then leave out, watering as necessary.

Outplanting: Can be planted outside in mid-May to early June. Plant out no later than June 7 or the heat may become too severe even with watering. Provide shading† in case of early heat wave soon after planting out. Maintain watering during first summer.

* See Potting Soil in introductory section on seedling care.

† See Shading in introductory section on seedling care.

References:

1. Faust, Krissy Boys, personal experience.
2. Prairie Moon Nursery Catalog& Cultural Guide (2005).

Ceanothus americanus
New Jersey Tea

Softwood cuttings root fairly well (Cullina 2002). Propagation by seed requires inoculum from soil by parent plant.

Seed Collecting: Collect seeds in late summer and early fall. Dry capsules disperse their seed abruptly with a sudden ejection, so begin harvesting when capsules begin to dry. Place in a sealed paper bag until popping stops. If possible, tie cloth bags around the clusters of capsules as they mature to catch the seeds.

Seed Treatment: Scarification may be necessary and can best be accomplished by immersing the seeds in hot water (180˚-212˚F) followed by a soak in cooling water for 24 hours. Moist stratify immediately after (in moist planting medium or vermiculite) for 60-90 days at 41˚F (Cullina 2002).

Sowing: Sow in a regular potting soil* to a depth of no more than twice the seeds' diameter. Water and keep moist at approximately 70˚F.

Growing on: Germinates in 2-3 weeks. Maintain moisture, light, and warmth. Within 6-8 weeks pot up seedlings in 3″ pots. Inoculate container plants with Frankia bacteria by mixing a cup of soil taken from around wild plants with a gallon of water and watering the pots with the slurry (Cullina 2002).

When temperatures are consistently into the 50's during the day, and above freezing at night, harden off by putting in cold frame and/or protected location for a few hours each day. Increase exposure each day for 5 days and then water (1-2 times daily) for first season. Overwinter in a cold frame or seed bed (inoculate seed bed soil as above).

Outplanting: Second year growth is rapid. Can be planted outside in mid-May to early June. Plant out no later than June 7 or the heat may become too severe even with watering. Keep moist during first summer after outplanting. Provide shading† in case of early heat wave soon after planting out.

* See Potting Soil in introductory section on seedling care.

† See Shading in introductory section on seedling care.

References:

1. Cullina, William, 2002, Native Trees, Shrubs, and Vines: A Guide to Using, Growing, and Propagating North American Woody Plants, Houghton Mifflin Harcourt, New York.

2. Faust, Krissy Boys, personal experience.

Desmodium canadense
Canadian Tick Treefoil

Inoculum recommended for best growth. Desmodium inoculum can be purchased from Prairie Moon††.

Seed Collecting: Seeds are ripe when the stem below the dried inflorescence has turned brown. Seed heads can shatter, so do not delay collection. Shake or cut & drop whole seed heads into paper bags and let dry for 3-5 days.

Seed Treatment: Let dry in paper bags, then put in jars or tins and store cold and dry. Before sowing inside, remove hulls and scarify with sandpaper. Rub seeds between two sheets of sandpaper to remove a portion of the hard coat.

Sowing: (end February) Place seeds on top of potting soil* and cover lightly with coarse grit, sand, or more potting mix. For best growth, add inoculum to planting mix†† (Prairie Moon 2005). Water and keep moist at 70°F or stratify at 40˚F for 10 days, then return to 70°F (NPIN 2009).

Growing on: Germinates in 2-3 weeks. Maintain light, moisture, and warmth. Keep seedling flats moist until germination, then as dry as possible; let them dry out fully before watering. Do not fertilize. This plant likes warm temperatures. Do not put outdoors until temperature is around 60°-70°F during the day.

Outplanting: Can be planted outside in late-May to early June. If no inoculum was used in planting mix, it would be beneficial to add to soil as you outplant (Prairie Moon 2005, NRCS 2000). Provide supplemental water during first summer. Plant out no later than early June or the heat may become too severe even with watering. Provide shading† in case of early heat wave soon after planting out. Apply no fertilizer the establishment year unless a soil test of outdoor seed bed indicates a severe deficiency of potassium and/or phosphorus. Use no nitrogen during the establishment year as this can encourage weed competition (NRCS 2000).

* See Potting Soil in introductory section on seedling care.
† See Shading in introductory section on seedling care.
†† See Inoculum in introductory section on seedling care.

References:

1. Faust, Krissy Boys, personal experience.
2. NRCS, 2000, *Desmodium canadense* Planting Guide, http://plant-materials.nrcs.usda.gov/pubs/mopmcpgdeca7alex.pdf .
3. NPIN, 2011, *Desmodium canadense*, Native Plant Information Network, Lady Bird Johnson Wildflower Center, http://www.wildflower.org/plants/ .
4. Prairie Moon Nursery Catalog& Cultural Guide (2005 & 2010).

Lespedeza capitata
Bush Clover

Inoculum recommended for best growth. Lespedeza inoculum can be purchased from Prairie Moon††.

Seed Collecting: Seeds are ripe when stem below dried inflorescence has turned brown. Shake or cut & drop whole seed heads into paper bags and let dry for 3-5 days.

Seed Treatment: Let dry in paper bags then put in jars or tins and store cold and dry. Before sowing inside, remove hulls and scarify with sandpaper. Rub seeds between two sheets of sandpaper to remove a portion of the hard coat.

Sowing: (middle-end February) Place seeds on top of potting soil* and cover lightly with coarse grit, sand, or more potting mix.). For best growth, add inoculum to planting mix (Prairie Moon 2005). Water and keep moist at 70°F or stratify at 40˚F for 10 days, then return to 70°F (Prairie Moon 2010, NPIN 2011).

Growing on: Germinates in 2-3 weeks. Maintain light, moisture, and warmth. Keep seedling flats moist until germination, then as dry as possible; let them dry out fully before watering. Do not fertilize. This plant likes warm temperatures. Do not put outdoors until temperature is around 60°-70°F during the day.

Outplanting: Can be planted outside in mid-May to early June. If no inoculum was used in planting mix, it would be beneficial to add to soil as you outplant (Prairie Moon 2005 & 2010). Provide supplemental water during first summer. Plant out no later than June 7 or the heat may become too severe even with watering. Provide shading† in case of early heat wave soon after planting out.

* See Potting Soil in introductory section on seedling care.

† See Shading in introductory section on seedling care.

†† See Inoculum in introductory section on seedling care.

References:

1. Faust, Krissy Boys, personal experience.

2. NPIN, 2011, *Lespedeza capitata*, Native Plant Information Network, Lady Bird Johnson Wildflower Center, http://www.wildflower.org/plants/ .

3. Prairie Moon Nursery Catalog& Cultural Guide (2005 & 2011).

Lupinus perennis
Wild Blue Lupine

Best growth is obtained when sown in-situ with inoculum. *Lupinus* inoculum can be purchased.††

Seed Collecting: Seeds are ripe when pods begin to split and the stem below the pods has turned brown. Collect from late June--early July.

Seed Treatment: It is easy to clean seeds as they are in large pods that shatter. In the field, empty pods into a paper bag. Later, separate seeds and let them dry on screens or in open paper bags for a few days. Store cold and dry in glass jars. When ready to sow inside, scarify first by rubbing seeds between medium grit sandpaper. (Do not scarify if planting outside in the fall.)

Sowing: Best to sow on final site in the fall after seed is collected and cleaned. Mix a little inoculum with the seeds as you sow and sow 3-5 seeds /square foot. Otherwise sow in the greenhouse in February after scarifying each seed and mixing with inoculum. Sow in a sandy 2:1 potting soil* mix. Moisten, cover with plastic, and store at 38°-40°F for 3-10 days. Then put the flat in a warm moist place and keep at 70° until seeds germinate and begin to grow (Prairie Moon Nursery 2005).

Growing on: Grow in pots or seed bed for as short a period of time as possible. Do not wait long to transplant as Lupines develop tap roots which make them difficult to establish. When temperatures are consistently into the 50's during the day, and above freezing at night, harden off by putting in cold frame and/or protected location for a few hours each day. Increase exposure each day for 5 days and then water (1-2 times daily) until planted.

Outplanting: Can be planted outside in mid-May to early June. If no inoculum was used in planting mix, it would be beneficial to add to soil as you outplant (Prairie Moon 2005 & 2010). Provide supplemental water during first summer. Plant out no later than June 7 or the heat may become too severe even with watering. Provide shading† in case of early heat wave soon after planting out.

* See Potting Soil in introductory section on seedling care.

† See Shading in introductory section on seedling care.

†† See Inoculum in introductory section on seedling care.

References:

Faust, Krissy Boys, personal experience.
Prairie Moon Nursery Catalog& Cultural Guide (2005 & 2010).

Monarda punctata
Spotted Horse Mint

Seed collecting: Seeds are ripe when stem directly below the dried inflorescence has turned brown. The seeds should shake out into your palm like fine black pepper. It is important to keep the seed heads upright until you tip them into an open brown paper bag.

Seed Treatment: Let seeds dry in the bag for 2-4 days and then it is easy to clean by tapping heads onto a paper plate or correctly sized screen to separate them from the chaff. The seeds will also be in the bottom of the bag so shake the bag gently over a tray or screen to remove clean seeds. Place them in a clean and dry glass jar and store them cold in the refrigerator or a cold shed until sown.

Sowing: (middle –end of February) Place seeds on top of potting soil*(needs light to germinate). Cover lightly with sand so that light can penetrate. Water and keep moist at 70°F.

Growing on: Germinates in 2-3 weeks. Maintain moisture, light and warmth. Keep seedling flats moist until germination, then as dry as possible; let them dry out fully before watering. Within 6-8 weeks pot up seedlings in 3″ pots. When temperatures are consistently in the 50's during the day and above freezing at night, harden off by putting in a cold frame and/or protected location for a few hours each day. Increase exposure time each day for 5 days and water 1-2 times daily until planted.

OutPlanting: Can be planted outside in mid-May to early June. Plant out no later than June 7 or the heat may become too severe even with watering. Provide shading† in case of early heat wave soon after planting out. Maintain watering during first summer.

* See Potting Soil in introductory section on seedling care.

† See Shading in introductory section on seedling care.

References:

Faust, Krissy Boys, personal experience.
Prairie Moon Nursery Catalog& Cultural Guide (2005).

Pinus rigida
Pitch Pine

Pitch pine is best sown directly into a seed bed or coldframe.

Seed Collecting: Seed dispersal begins late fall and ends in the spring. Collect unopened cones and let them dry indoors for a few days (Cullina 2003).

Pinus rigida seeds

Seed Treatment: If they haven't popped open, put in warm oven (<120˚F) for 1-2 hours and they should open. The “wing" on the seed does not need to be removed (Cullina 2003).

Sowing: Plant directly into a cold frame or seed bed for the winter (protect from mice!!!) (Cullina 2003). Press seeds into seedling beds that are prepared with a peat and sand 1:1 growing mix*. The mix can be made on site and added to an outdoor bed that is preferably boxed in with timbers to form a raised bed. Typically, for large scale production, the seeds are pressed into the soil mix at a rate that produces 320-380 seedlings/m• (Schopmeyer 1974).

Growing on: Seedlings emerge in the spring following fall sowing. Seedlings must be monitored closely for irrigation needs. If you want to grow seedlings in pots for more protection and to minimize transplant shock upon final outplanting, transfer to liner pots for 1-2 years once the whorl of cotyledons has fully expanded (Cullina 2003). Otherwise, leave in the seed bed for 1-2 years before outplanting. Young seedlings should be shaded† as soon as they emerge with poly screening (or laths) at 30%. Shading should remain over seedlings until mid-August (King 2003). Let soil dry, or nearly dry, between waterings. Beginning in September, use irrigation only in a severe drought situation (King 2003).

Fertilizing: King et al. reported a successful fertilizer regime for field grown *P. rigida*. Their mix was a nutrient-poor sandy loam amended with organic matter, such as composted leaves and manure. Seedlings in the nursery beds were fertilized from mid-April with a granular 10-10-10 once a week through early June. From mid-June through late July, the 10-10-10 was alternated with a granular urea every other week. From late July through late August the seedlings were fertilized with 10-10-10 every two weeks. Overhead irrigation was used after every fertilization. The rate of water applied was determined by soil moisture prior to irrigation (King 2003).

Outplanting: Pitch Pines grow slowly for the first 3-5 years, and then at a medium rate, ~ 6-18 inches per year (Little 1998). Best if outplanted in early spring (end of March or early April). Otherwise, wait until fall and plant in cool wet weather around mid- October (4-6weeks before hard freezing begins). Maintain watering through first summer.

* See Potting Soil in introductory section on seedling care.

† See Shading in introductory section on seedling care.

References:

1. Cullina, William, 2002, Native Trees, Shrubs, and Vines: A Guide to Using, Growing, and Propagating North American Woody Plants, Houghton Mifflin Harcourt, New York.

2. King, Brandy; Davis, Kathy; Kujawski, Jennifer. 2003. "Propagation protocol for production of field-grown *Pinus rigida*". plants (3+0 bareroot seedlings); USDA NRCS - Beltsville National Plant Materials Center, Beltsville, Maryland. In: Native Plant Network, http://www.nativeplantnetwork.org (20 January 2011).

3. Schopmeyer, C. S. 1974. Seeds of Woody Plants in the United States. U.S. Department of Agriculture, Agriculture Handbook 450. Washington, DC. 883 p.

4. Little, Silas and Peter W. Garrett, 1998, USDA Forest Service, in Western North Carolina Nature Center http://www.wildwnc.org/education/trees/pitch-pine-pinus-rigida-pinaceae-pine-family (20 January 2011)

Salix tristis *(Salix humilis* Marsh. var. *tristis* (Aiton) Griggs)
Dwarf Prairie Willow

Salix humilis var *tristis* can be propagated easily from cuttings or by seed.

Seed Propagation – Collecting: The female flowers of *Salix humilis* form chains of capsules containing small cottony seeds that are dispersed by the wind (NPIN 2011). Pick chains when the first few pods start to split and let dry in a bag for a few days. Working outdoors (!) comb seeds & silk out of bags, leave any attached silk on the seeds. Save the cottony silk (Cullina 2003).

Sowing: Sow immediately. Spread 1/4 inch cottony mass over dampened soil mix* and mist until the mass is flattened & seeds touch the mix (Cullina 2003). (If you lost the cottony mass, just sow directly on moist soil mix and cover.)

Growing on: Seeds will germinate within a few weeks. Transplant to pots at 2" high and grow on for the rest of summer. You "can see 16-24" growth in 1 season." (Cullina 2003, referring to *Salix* species in general.)

Cuttings – Collecting & Growing on: The rooting ability of *S. humilis* is "fair" using live stakes, live cuttings, or poles (NRCS USDA 2007). Cullina recommends rooting from year old whips. Take sections (corresponding approximately to one year's growth) from the prior season's wood in late winter BEFORE catkins expand. Stick 1/3-1/2 of length (butt end) into moist soil or water and the stems will root & leaf out later in spring (Cullina 2003, referring to *Salix* sp.).

If Salix is to be planted in a wetland, most propagators would plant cuttings directly into the final location. The NRCS/USDA has developed a pole planting method that they recommend for Salix species. For a detailed description and directions, see NRCS/USDA 2007.

Outplanting: Move to final location at your discretion, possibly as early as the first fall, more likely the second spring or fall. Can be planted outside in mid-May to early June. Otherwise wait until fall. Provide supplemental water if needed during first summer after outplanting. Provide shading† in case of early heat wave soon after planting out.

* See Potting Soil in introductory section on seedling care.

† See Shading in introductory section on seedling care.

References:

1. Cullina, William, 2002, Native Trees, Shrubs, and Vines: A Guide to Using, Growing, and Propagating North American Woody Plants, Houghton Mifflin Harcourt, New York.

2. NPIN, 2011, *Salix humilis*, Native Plant Information Network, Lady Bird Johnson Wildflower Center, http://www.wildflower.org/plants/ .

3. NRCS USDA 2007, Plant Materials Technical Note - No. 1, January 2007, Plant Species with Rooting Ability from Live Hardwood Materials for use in Soil Bioengineering Technique, Plant Materials Program, http://plants.usda.gov/plantguide/pdf/cs_sahu2.pdf.

Schizachyrium scoparium
Little Blue Stem

This species does not transplant easily from divisions. Propagate from seed.

Seed Collecting: collect seeds in the fall anytime from September through December. Seeds will show up on sides of stems and will be small and fluffy (see image below). Drag fingers along the stem to remove a bundle of seeds and place in a paper bag.

Fluffy seeds are ready to harvest

Seed Treatment: Let seeds dry in the paper bag for 1-5 days. Store in jars or tins in cold dry storage until sown.

Sowing: (middle- end February) Place seeds on top of potting soil* and cover lightly with coarse grit, sand, or more potting mix. For best results use deep cell flats or pots. Water and keep moist between 70° and 85°F.

Growing on: *Schizachyrium* germinates in 2-3 weeks. Maintain moisture, light and warmth. Keep flats as dry as possible; let them dry out before watering. This plant likes warm temperatures. Do not put outdoors until temperature is around 60°-70°F in the day time.

Out planting: *Schizachyrium* can be planted outside in mid-May to early June. Plant out no later than June 7 or the heat may become too severe even with watering. Provide shading† in case of early heat wave soon after planting out. Maintain watering during first summer.

* See Potting Soil in introductory section on seedling care.

† See Shading in introductory section on seedling care.

References:

1. Faust, Krissy Boys, personal experience.
2. Prairie Moon Nursery Catalog& Cultural Guide (2005).

Quercus ilicifolia
Bear Oak

Oaks of the United States belong to a group of species called "temperate recalcitrants." They are "temperate" because they grow primarily in the temperate zone; they are "recalcitrant" because their seeds do not tolerate desiccation below critical moisture content (approximately 20 to 35 %). *Quercus ilicifolia* is in the Red Oak Group; the propagation information below is generic for this group and taken largely from a paper by F. Bonner (Bonner 2003).

Seed Collecting: Collect acorns in the fall - September/October.
Estimating the Acorn Crop - When planning acorn collections, it is usually wise to survey the crop potential in the spring in the area selected for collection. If few immature acorns are present, then plans must be changed to collect in other areas. (Bonner2003)

First inspection of trees to determine the potential crop should be in late spring when all acorns that will mature that year are easy to see. Red oak acorns require two years to mature, and branches in late spring will display small 1-year-old acorns and the much smaller current year's acorns that will mature in about another 18 months (Bonner 2003).

As good acorns rapidly increase in size, however, aborted acorns or acorns that have been destroyed by insects will not grow. The pericarps of many will turn dark and are readily visible (Bonner 2003).

Acorns should be collected when they are fully mature and not before. Collection of mature acorns directly from limbs will produce the highest quality of seeds. The best maturity indices for acorns are (Bonner and Vozzo 1987):

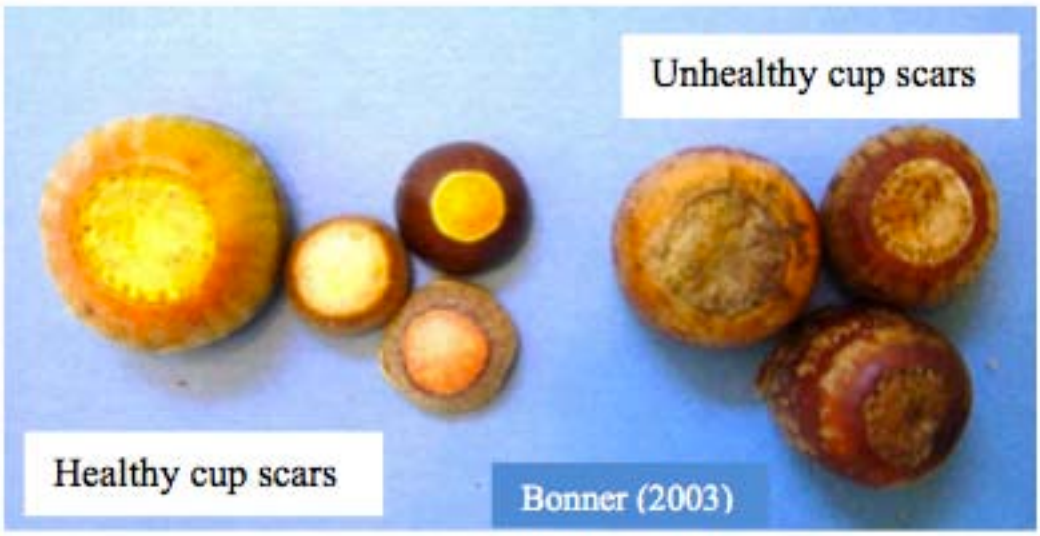
(1) Color of the pericarp. In red oaks the pericarps should have lost their green color and be primarily dark brown or black before collection as shown below.

Pericarp color
(Bonner2003)

(2) Ease of separation of acorns from cups. When acorns are mature, their cups come away cleanly with only slight pressure. If attempts to remove the cups cause them to break apart and leave pieces attached to the acorn, then the acorns are not yet mature. This is a simple test to carry out when collecting from branches (Bonner 2003).

(3) Cup scar color. In red oaks, the cup scars on mature acorns are "bright" in color (see below). If cup scars are dark on freshly fallen acorns, they are probably no good. The dark colors usually indicate insect or disease damage and the onset of deterioration. **The bright colors fade within a few days of**

cup loss, however, so many good acorns collected from the ground may not show these bright colors. Under these conditions the cup scars will be sort of "off-white" or ivory, but not dark (Bonner 2003). It may be easier to collect acorns from the ground. The first acorns to fall are likely



to be diseased or insect infested. When good acorns start to fall, they should be collected from the ground within just a few days after they have fallen. There are two reasons for this action. First, predator losses can be significant: deer, squirrels, turkeys, grackles, etc. Second, acorns begin to dry as soon as they hit the ground. In hot, dry conditions, some acorn quality is lost in 24 hours; by day 3 or 4, the acorns may be dead. **Acorn moisture content cannot be emphasized too much**; as little as 5% moisture loss will decrease acorn quality to some degree! Collection from the ground is usually done by hand-raking everything together and placing it into bags or drums (Bonner 2003). Discard any with weevil holes. Collect 2-3 times the number of acorns as seedlings desired to allow for non-viable acorns (Cullina 2002).

Seed Treatment: Warning - acorns can survive for years at 2 or 3 degrees below freezing, but short periods at much lower temperatures will be fatal. Frozen acorns turn black in color, but this

A double-weave plastic bag can be used in field collections. The same type of bag is also very good as a storage container (Bonner 2003).

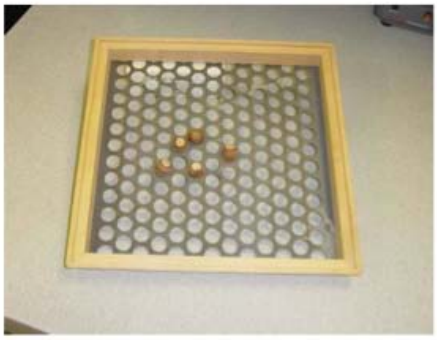
change may not occur until several weeks after they have been collected (Bonner 2003). Collectors should be aware of this potential problem, however, and not leave collected seeds outdoors in freezing conditions.

Because of the recalcitrant nature of acorns, much acorn quality is often lost between collection and storage. Acorns must be kept **moist** to maintain good seed quality. They should be collected and transported in plastic bags or in containers that can be covered to reduce moisture loss, especially if extended travel in the back of trucks is required. Double-weave plastic bags that are commonly used for grain seeds are very good. They prevent excessive drying, yet allow adequate air circulation (Bonner2003).

The steps that are taken to inhibit moisture loss also can lead to the problem of overheating (Gosling 1989). Overheating must be avoided, especially when plastic bags are used. Acorns should be kept in the shade while awaiting transport, and during transport, trucks should be parked in the shade when not moving. If the weather is warm, dry, and/or windy, spray the acorns with water. These are small things, but they can help maintain seed quality. In (Bonner's) experience, a loss of 5% moisture can be tolerated, but additional desiccation can lower acorn quality. If acorns are dried too much before and during collection and transport, especially if they "rattle", moisture can usually be replaced by immersing the acorns in water at room or cold-storage temperature (Gosling 1989). This must be done the same day as collection.

Acorn Viability
Float Test
(Bonner 2003)

Cleaning Acorns - As soon as possible after collection, all acorns should be immersed in water.



Round-hole cleaning screens can be used for sizing acorn lots.
(Photo - Bonner 2003)

This procedure serves two functions. First, it allows removal of leaves, cups, other trash, and insect-damaged acorns that float. Sound, healthy acorns typically sink in water. Second, immersion helps maintain that all-important high seed moisture (Bonner 2003, Cullina 2003).

Acorns collected from wet conditions should separate easily at initial floating. If conditions are extremely dry when acorns are collected from the ground, many good acorns will float initially. Acorns should be kept in the water for 24 hours to elevate their moisture content and allow sound acorns to sink. Sometimes acorns will go halfway, neither floating nor completely sinking. These acorns are usually damaged by insects, but are too heavy to float on the surface. They should usually be discarded (Bonner 2003).

If acorns are to be sized, the separations should be done at this time. There is an increasing body of evidence that suggests that seedlings grown from the smallest acorns never perform as well as seedlings grown from larger acorns. Various screens can be used to quickly sort by size (Bonner 2003).

Decision Point:
Option 1 – Plant directly in a seed bed outdoors, letting the winter provide the necessary cold stratification. (Skip to Outplanting below.)

☒ Benefits: no need for refrigerator storage

☒ Deficits: rodent protection necessary, the seedlings will be more disturbed on transplant, less chance to remove non-viable seeds

Option 2 – Cold-stratify indoors (see below)
☒ Benefits: more control over seedling growth & timing, less transplant shock & mortality

☒ Deficits: more labor intensive, more space required

Storage - Acorns of most red oaks can be stored for 3 years without critical losses in viability (Bonner 1973). Short-term storage under good conditions between collection and sowing is essential to maintain viability. Acorns of red oak species should be stored with their moisture contents at 30 percent or higher in temperatures near, but above, freezing (34° to 40°F). Air tight storage is lethal, so containers must allow some gas exchange with the atmosphere while maintaining high acorn moisture levels (Bonner 1973). Polyethylene bags with a wall thickness of 4 to 10 mils (1 to 2.5 mm) are good for small samples. For large quantities of acorns, storage can be

Damaged Radicles
(Photo: Bonner 2003)

in double-weave plastic, drums, cans, or boxes with polyethylene bag liners. Container tops and liners should not be completely closed; this will allow sufficient gas exchange. If water collects in the bottoms of storage containers, it should be drained (Bonner 2003).

William Cullina, formerly of the New England Wildflower Society, recommends storing the acorns in dampened vermiculite for 90-140 days at 40°F. He claims that this will protect any sprouting acorns while assuring the correct moisture (Cullina 2002).

Sowing: Remove from refrigeration in spring, but leave the acorns in bags or containers at room temperature for 1-2 weeks. Periodically pull out & pot any acorns that germinate or split. After 2 weeks, toss the remainder. Plant the viable/sprouted acorns in 3x5" deep pots* or directly in the field and protect from severe weather and herbivory (Cullina 2002).

Microorganisms kill many radicle tips in storage and many more are broken when sowing takes place. Secondary radicle development occurs in oaks, however, and other radicles should develop, so these are still worth potting (Bonner 2003).

Growing on: Maintain light†, moisture, warmth, and protection through the summer. In fall, transplant into 5x8" pots to overwinter and plant out the 2nd year (Engle 2011)

Outplanting: Plant out the second year in the fall to avoid desiccation in wind and summer heat (Engle 2011).

* See Potting Soil in introductory section on seedling care.

† See Shading in introductory section on seedling care.

References:

1. Bonner, F.T., 2003. "Collection and care of acorns: a practical guide for seed collectors and nursery managers", version 1.1. *URL:* http://www.nsl.fs.fed.us/COLLECTION%20AND%20CARE%20OF%20ACORNS.pdf (accessed 18 Jan 2011).
2. Bonner FT, Vozzo JA., 1987. "Seed biology and technology of *Quercus*". New Orleans (LA)*:* USDA Forest Service, Southern Forest Experiment Station*. General Technical Report SO-66. 21 p.*
3. Cullina, William, Native Trees, Shrubs, and Vines: A Guide to Using, Growing, and Propagating North American Woody Plants, Houghton Mifflin Harcourt, 2002.
4. Engle, Jim, 2011, personal communication, White Oak Nursery, Canandaigua NY.
5. Gosling, Peter G. 1989. The effect of drying Quercus rubur acorns to different moisture contents, followed by storage, either with or without imbibition. Forestry. 62(1): 41-50.
6. Hoss, Greg, 2011, personal communication, Forest Nursery Supervisor George O. White State Forest Nursery, Missouri Department of Conservation.

MANAGEMENT RECOMMENDATIONS

Management Recommendations

Recommendation One (1)

CONNECT CITY OWNED PARCELS

The city owns lands that fall outside the existing borders of the Woodlawn Preserve, in particular areas 1 through 7 on Figure 27. These should be designated forever wild and become part of the preserve. This act will make up for the areas that were developed within the preserve borders as delineated in 1969. Those isolated parcels, 5, 6 and 7 will be used as germination centers ("Butterfly Gardens" and "Flora Nurseries") to grow specific Pine Bush flora that can be reintroduced into the main preserve. Having isolated parcels as biota refuges is useful as pine barrens burn regularly through natural and man made means.

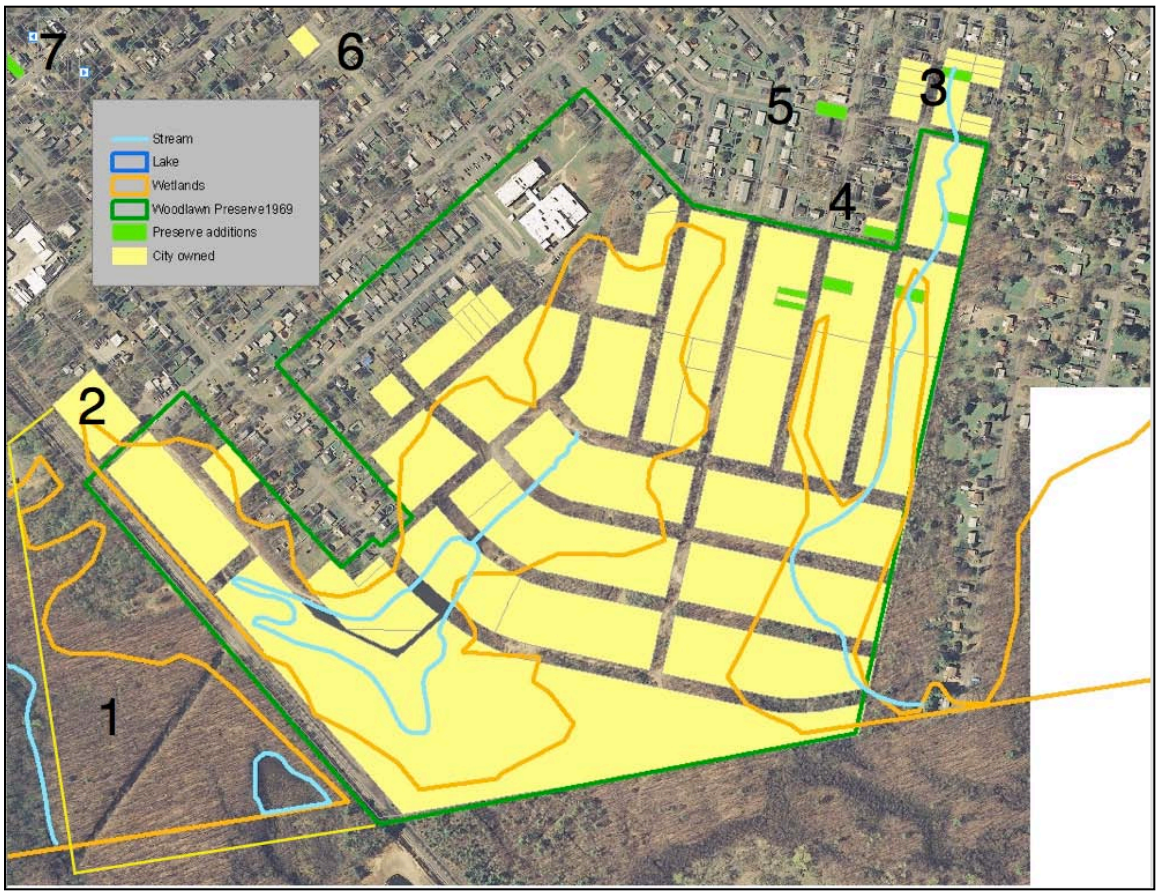


Figure 27. Seven areas owned by the city should be set aside and included into the Woodlawn Preserve. Map Source: Schenectady County Planning.

Vacant Parcels	Woodlawn			
Parcel ID	Address	Ca. Acres	Frontage	Depth
60.62-2-19.1	Chiswell 401	0.20	85	105
60.64-1-11	Colonial	0.11	40	120
60.64-1-12	Colonial	0.13	50	120
60.64-1-13	Colonial	0.13	5	120
60.64-1-14.1	Leroy	0.28	1.2	100
60.64-2-11	Gasner	0.11	40	120
60.64-2-12	Gasner	0.11	40	120
60.64-2-13	Gasner	0.11	40	120
60.64-2-15	Gasner	0.09	3.5	120
60.64-2-16	Gasner	0.12	4.5	120
60.64-2-17	Colonial	0.55	200	120
60.64-2-19	Colonial	0.11	40	120
60.64-2-20	Colonial	0.11	40	120
60.70-3-10	Trumball	0.91	2.85	140
60.70-3-10	Trumball	0.91	285	140
60.70-3-12.11	off Chadwick Rd	0.11	4	120
60.70-3-6	Trumball	0.25	8	140
60.70-3-7	Trumball	0.13	40	140
60.70-3-8	Trumball	0.12	40	140
60.70-3-9	Trumball	0.13	40	140
60.70-3-9.11	Clement	1.89	0	0
60.71-1-15	Maryvale	0.12	7.7	130
60.71-1-16.1	Van Buren	1.77	4.33	240
60.71-2-11	Colonial	0.11	3.5	120
60.71-3-1.11	Maryvale	2.74	0	0
60.71-3-27.2	Clement	0.07	2.5	120
60.71-3-4.11	Maryvale	2.49	0	0
60.71-3-9-11	Clement	1.89	0	0
60.72-1-1.1	Leroy	2.31	2.4	440
60.72-1-10.1	Gasner	1.91	3.7	240
60.77-1-8.1	Climax	1.48	285	229
60.78-1-10.1	Trumball	0.39	120	140
60.78-1-29.1	Climax	0.69	200	150
60.78-2-1.1	Clinton	3.5	7.1	140
60.78-3-1.1	Clinton	2	8.6	95
60.78-3-21.11	McDonald	2.9	5	110
60.78-3-7.1	Dearborn	0.67	120	240
60.78-4-7.11	McDonald	3.3	6.32	240
60.78-4-7.2	McDonald	0.12	36	150
60.79-1-1	Van Buren	2.5	4.4	240
60.79-1-12	Starling	0.87	325	120
60.79-1-2.1	Van Buren	1.21	4.45	120
60.79-1-3	Starling	0.32	120	120
60.79-1-5.11	Clement	2.42	0	0
60.79-2-1.11	Clement	3.14	0	0
60.79-2-3.1	Colonial	3.11	570	240
60.79-3-1.1	Starling	4.5	8.2	240
60.79-3-8	Trumball	0.13	4	140
60.79-4-1.11	Dearborn	5.3	2.4	648
60.79-4-39.1	Starling	4	2.4	717
72.22-1-1.1	Climax	2.25	0	275
72.23-1-1.1	McDonald	3.3	6.32	240
72.22-1-1.11	Climax	2.25	0	0
72.23-2-1.1	Starling	4	0	0
72.23-2-2.1	Starling	4.5	0	0
	Total	78.87		

Figure 32. A sampling of vacant lots near Woodlawn Preserve that can be used as flora gardens. The following parcels are located in the surrounding area of the preserve and owned by the city. These should be allocated to the preserve. They total a little more than 70 acres combined. Location maps are located in the Appendix VI.

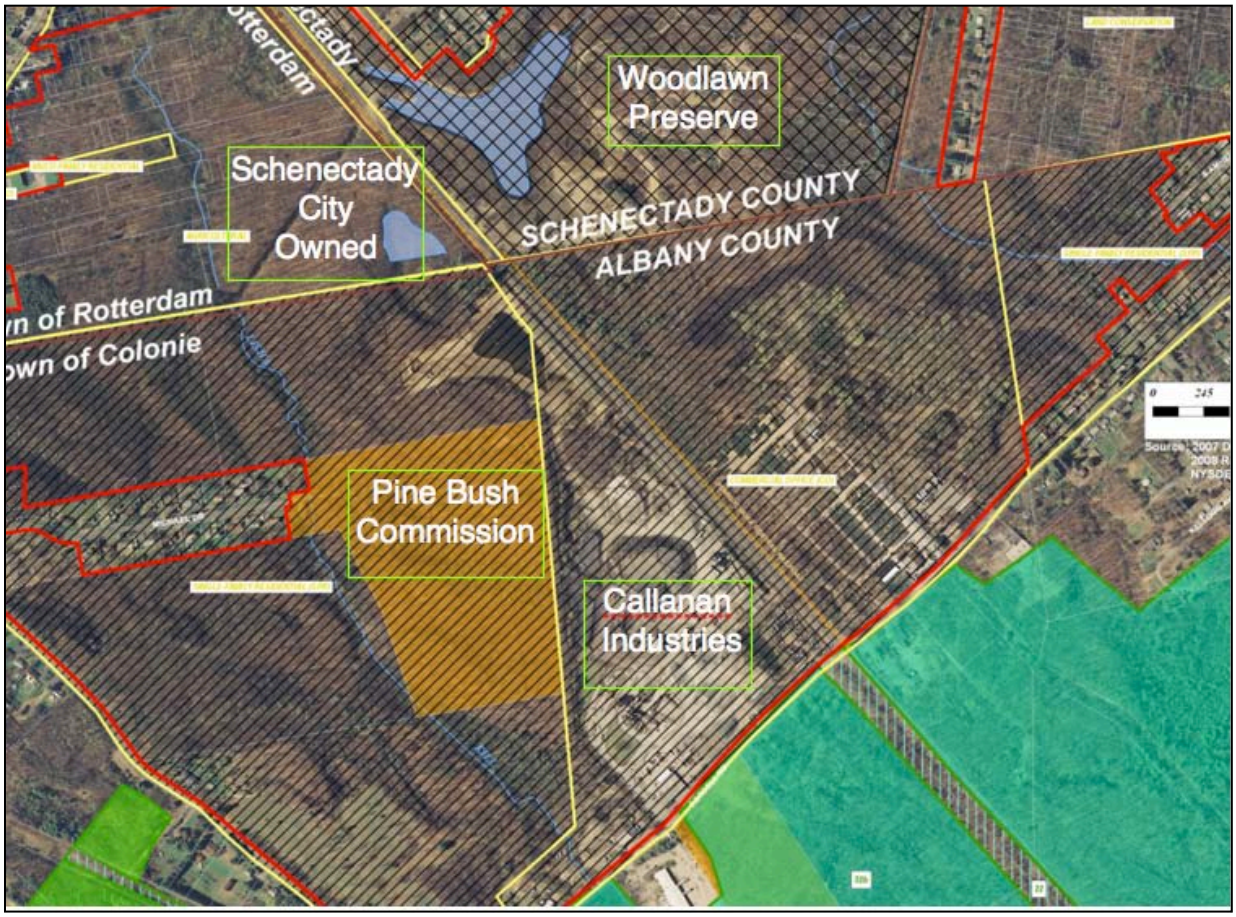


Figure 28. Current conditions. Map Source: Schenectady County Planning.

Recommendation Two (2)

DEVELOP AND FINALIZE AN MOU WITH CALLANAN INDUSTRIES, INC.

Callanan Industries, Inc. is a leading supplier of paving materials and construction services in New York State. The King Road Materials facility on Cordell Road located in the western portion of Albany County and in Schenectady was acquired by Callanan Industries in 1987. The property is 88 acres in total with 10 acres allowed for sand mining, 32 acres for asphalt, recycling; concrete, office, and equipment activities and 29.4 acres are wetland or undeveloped woodlands available for wildlife habitat.

The 29.4 acres of wetlands is near city owned lands to the northwest and southwest of the Woodlawn Preserve. It also is the eastern border of a large parcel managed by the Albany Pine Bush Preserve Commission.

The Callanan parcel protects and enhances the habitat of the spotted turtle population that inhabits the northwest section of the property. In 2005, Callanan did a natural history survey of the parcel and developed a management plan for their parcel. This parcel also forms a northwest border to areas that have been deemed important to protect by the Albany Pine Bush Commission.

Goals of an MOU (Memorandum of Understanding) would be allowing consistent management with those developed for Woodlawn, and as currently written do not conflict. The Callanan management plan is included in the appendix in this report. Also see Figure 63.

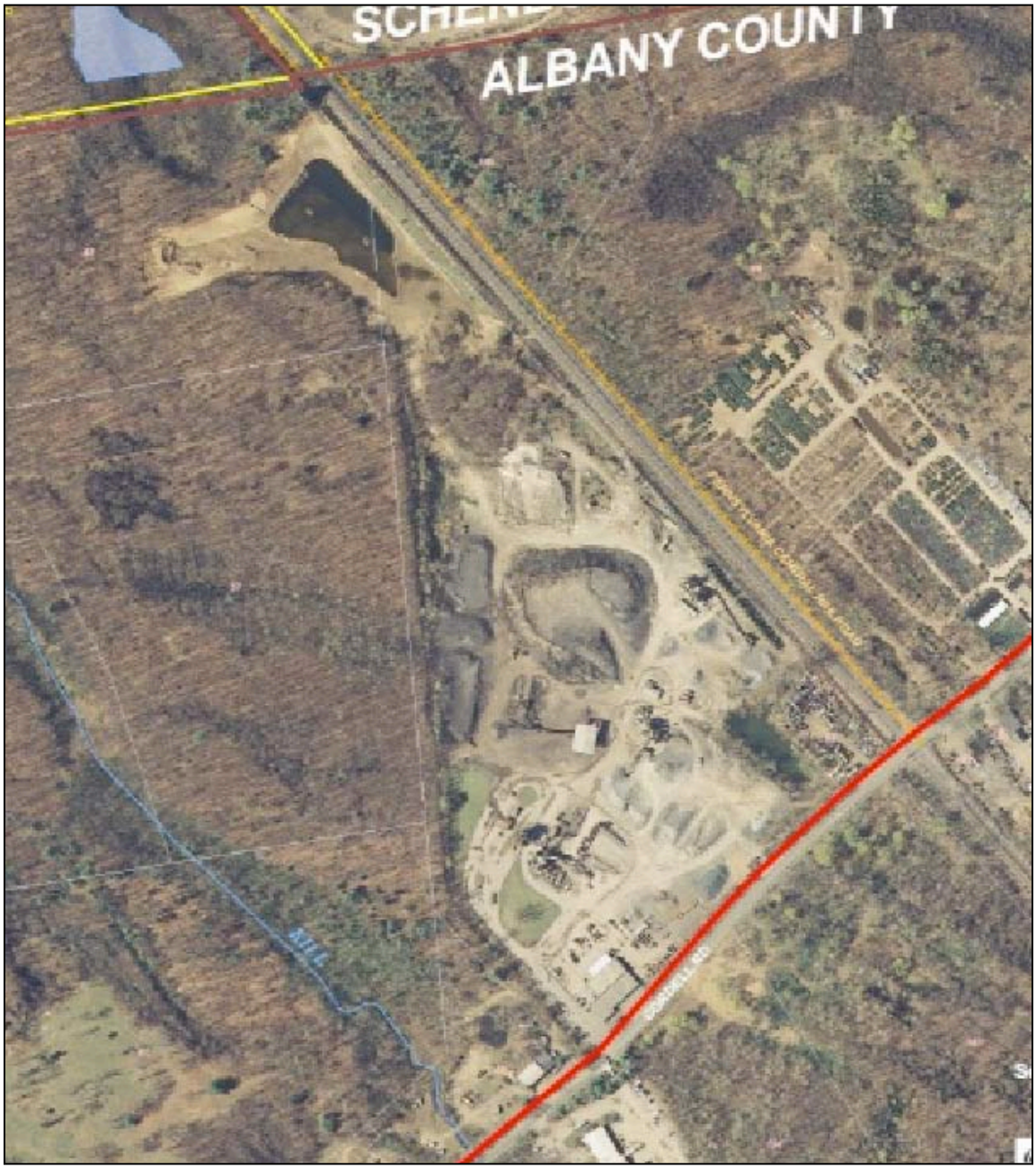


Figure 29. Close-up of Callanan Operations off Cordell Road. Their wildlife habitat is at top of the photo. Map Source: Schenectady County Planning.

Recommendation Three (3)

CONNECTIONS TO WOODLAWN AND PINE BUSH PROPER

To assure a viable long lasting pine barrens preserve in the Capital District, the more land preserved the better the chance of survivability. Within the study area there are four major areas that should be acquired through acquisition, donations, or easements.

Area 1

This region is contiguous to the existing Woodlawn Preserve and the 19 acres of wetland owned by the county and given to the Town of Niskayuna as parkland. It is located in Albany County and the Town of Colonie. A tributary of the Lisha Kill runs through and much of it is wetland. The southern border contains development along Cordell Road. However, a piece on the northeast along the road could act as a biological corridor with the lands across the road that are listed as a priority by the Pine Bush Commission as partial or full protection (Figure 74).

Area 2

This section borders on the western lands owned by the city of Schenectady and would connect directly to the Woodlawn Preserve provided the city designates its piece west of the railroad as preserve. The Lisha Kill runs through this piece and the Woodlawn Lake drains into it. The portion to the west of it is in Rotterdam.

Area 3

3a

Also located in the Town of Colonie, the northern boundary meets with the Town of Rotterdam. This piece would connect to the parcel already under Nature Consevancy control and could connect to the city preserve to the north. The Lisha Kill runs through the property. The southern border is the Pine Bush preserve and Michael Drive that is a housing development. The Lisha Kill is the eastern border of this development and along with the Pine Bush parcel creates a dividing line between the undeveloped north and southern parts.

3b

This section is south of Michael Drive and west of the Pine Bush preserve. The southern end is Cordell road and would connect to the larger Pine Bush Preserve if the Pine Bush Commission acquires the lands south of Cordell Road.

Area 4

This small section in the northernmost part of the study area would connect the county wetlands to the Woodlawn Preserve if section one were acquired. A tributary of Lisha Kill flows through it.

Area 5

This undeveloped part of the Pine Bush is the northern most section that is separated by the Woodlawn Preserve by one street with homes. It is now designated Park by the county and Town of Niskayuna and should become part of the management of the Woodlawn Preserve.

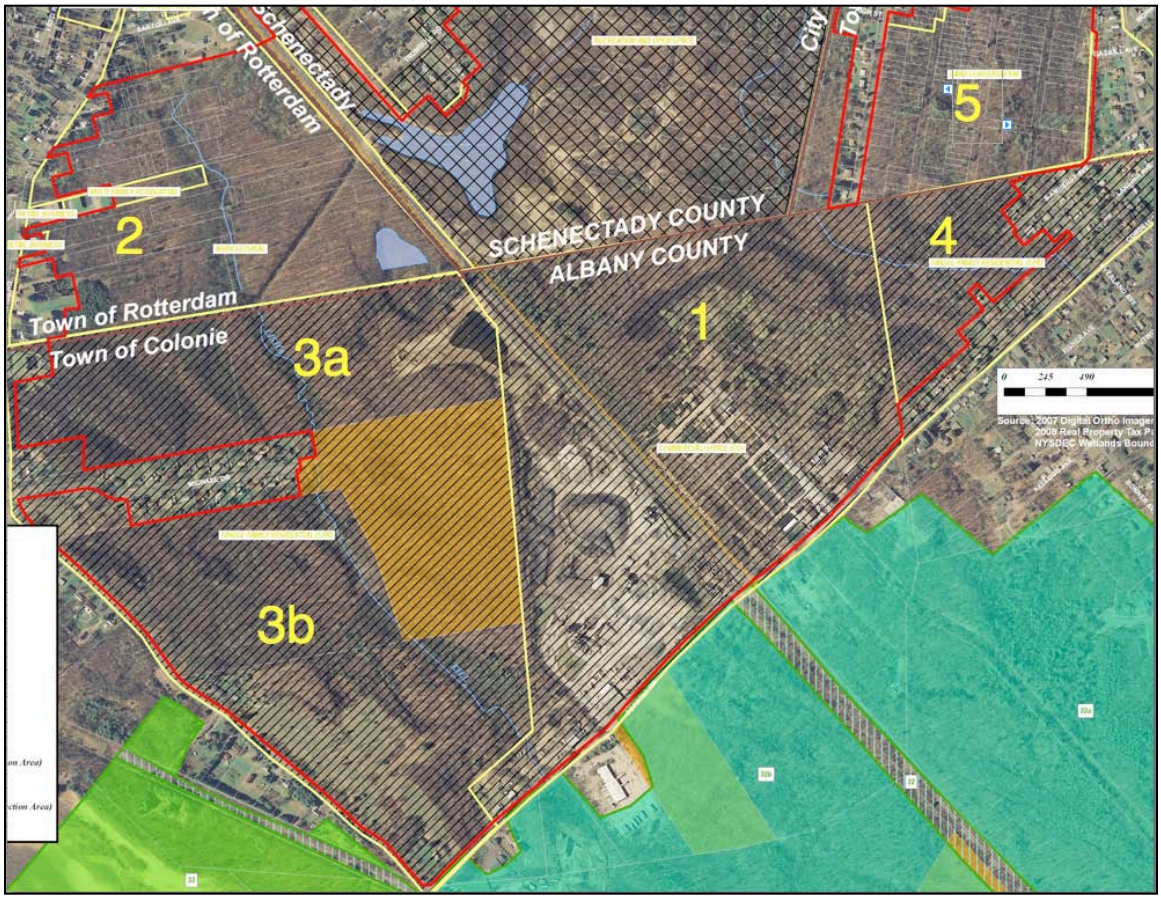


Figure 30. Acquisition sites. Map Source: Schenectady County Planning.

Recommendation Four (4)

COUNTY/NISKAYUNA CONNECTION

Connect the 19 acres of wetlands owned by the county and given to Niskayuna and designated forever wild to the Woodlawn Preserve. According to Jeff Edwards, Schenectady County Environmental Management, the County has transferred most of that area to Town ownership for the purpose of it being maintained as parkland. It had already been zoned land conservation.

Figure 31. County owned Wetlands located in Town of Niskayuna should become part of the Woodlawn Preserve. Map Source: Google Earth.

Figure 32. County owned wetlands in relation to Woodlawn Preserve. Map Source: Google Earth.

Recommendation Five (5)

CREATE MIGRATION ROUTES

If all parcels were protected, this would allow species migration back and forth between preserves in Albany and Schenectady counties. Two tunnels should be excavated under the railroad tracks during construction of the new second rail that will act as migration routes for larger animals that can move unimpeded and in no danger of being killed by fast moving trains.

Figure 33. Spotted Salamanders using the tunnel to cross under Henry Street in Amherst.

Figure 34. The sign informs drivers to slow down From USDOT, FHA.

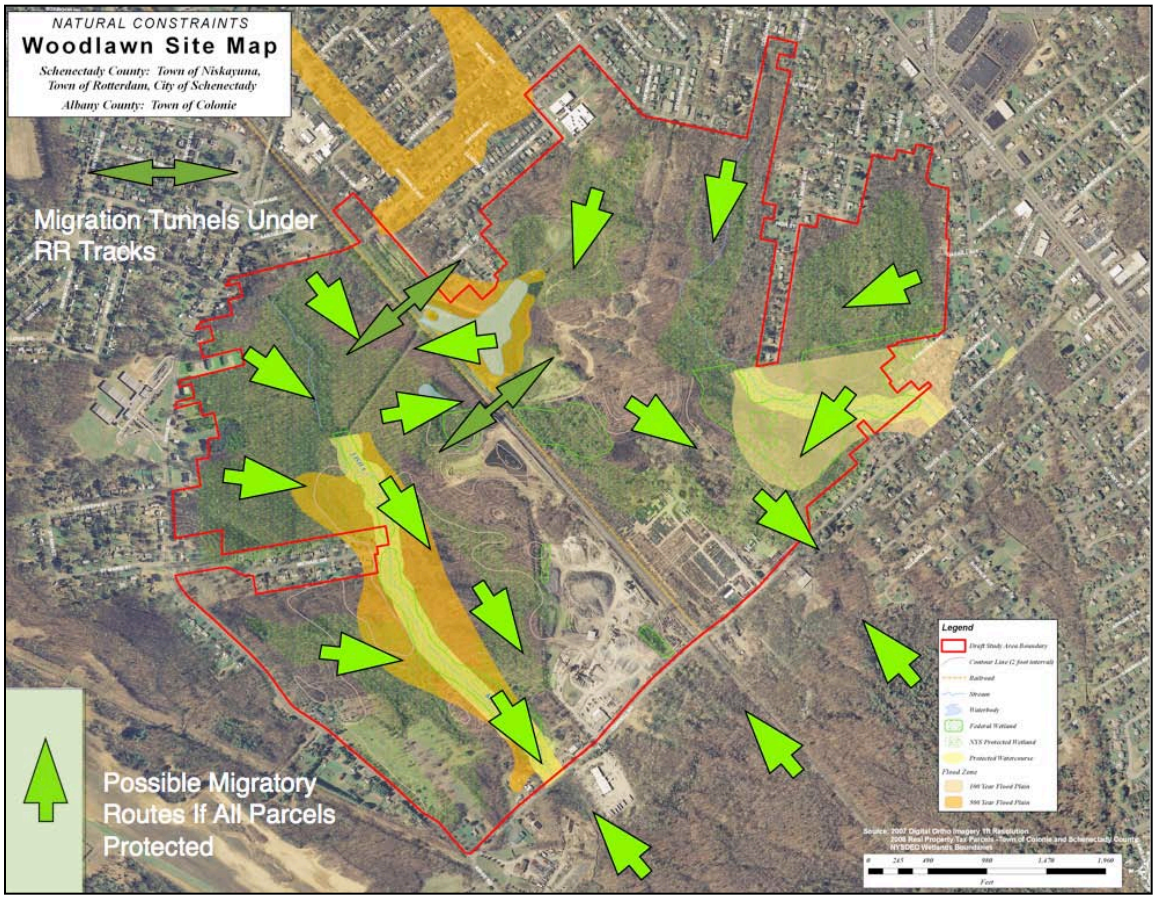


Figure 35. Map showing possible migration routes for mobile species. Map Source: Google Earth.

Migration tunnels have been applied all over the world. In 1997 in Amherst, Massachusetts, salamander tunnels were built to allow these spawning animals to survive by crossing under Henry Street. The British Fauna and Floral Preservation Society and ACO Polymer in Germany provided funds for an experimental tunnel project

See (http://www.fhwa.dot.gov/environment/wildlifecrossings/salamand.htm)

Two tunnels, 200 feet apart, were built at the salamanders' crossing site, and short "drift fences" were constructed to guide migrating Spotted salamanders into the tunnels. Each tunnel had a slotted top to let in light and provide the damp conditions salamanders need.

The first wildlife crossings were constructed in France during the 1950s and other European countries including the Netherlands, Switzerland, Germany have been using various crossing structures to prevent or reduce killings for several decades and use a variety of overpasses and underpasses to protect and reestablish wildlife such as: amphibians, badgers, ungulates, invertebrates, and other small and large mammals.

Figure 36. The Cerviduct is one of more than 600 wildlife crossings in the Netherlands. From Wikipedia.

According to published sources wildlife crossings are becoming very common in Canada and the United States. The most recognizable wildlife crossings in the world are in the Banff National Park in Alberta, where "vegetated overpasses provide safe passage over the Trans-Canada Highway for bears, moose, deer, wolves, elk, and many other species." The two-dozen wildlife crossings in Banff were done as part of a 1978 road improvement project.

Figure 37. Baniff National Park wildlife overpass. From Wikipedia (http://en.wikipedia.org/wiki/Banff_National_Park).

In the United States, thousands of wildlife crossings have been built in the past 30 years that include culverts, bridges, and over/underpasses. These have been used to protect Mountain Goats in Montana, Spotted Salamanders in Massachusetts, Bighorn Sheep in Colorado, Desert Tortoises in California, and endangered Florida Panthers in Florida.

Two tunnels or culverts large enough for deer size animals should be constructed under the railroad tracks. If lands are purchased on both sides of Cordell, migratory tunnels could also be completed there.

On a local scale, trains affect wildlife habitats through the introduction of exotic plant species (e.g. seeds), emission of toxic contaminants like heavy metals, or management (e.g. herbicides). An agreement should be arranged with CSX and Amtrak that the use of these materials is stopped in the preserve area and that "weeding" for track management is done manually. A good discussion of this topic can be found on the Internet at

http://www.wildlandscpr.org/node/221

and

http://www.wildlandscpr.org/node/220

One study in New South Wales compared mammal use of long-established drainage culverts and newly constructed tunnels under the Maldon-Dombarton rail line, near Wollongong, New South Wales.

Small mammals used the established culverts, but use of the new tunnels was predominantly by feral predators. They predicted frequent use by small, native mammals would not occur until native vegetation regenerates around the tunnel entrances, establishing a connection between undisturbed vegetation on the two sides of the track.

In Spain, a study of 17 culverts across a high-speed railway for a year determined that carnivores, lagomorphs, small mammals and reptiles used the passages.

Figure 38. Railroad tracks in Woodlawn Preserve looking south. Originally there were as many as four tracks along this route. A new second high-speed rail has been approved. A wildlife migratory tunnel should be built here at this location. Photo by Don Rittner.

"DO NOT CROSS TRACKS" signs should be placed on both sides of the railroad tracks to discourage hikers and visitors from trying to get on the other side of the tracks. There is public access on the other side via Callanan Industries.

Recommendation Six (6)

CREATE A BERM/LEVEE TO PREVENT SPILLOVER FROM LAKE

In periods of high water table, spillover from the lake in the preserve floods the surrounding areas along the south and north shorelines. This spillover kills plants that have tried establishing themselves in the open sunny areas surrounding the lake.

To prevent this and to preserve a trail system that will run along the southern and northern line of the lake, a berm or levee should be created that flanks the southeastern part of the lake (See Figure 51). This will allow fluctuations in the lake but protect the reestablishment of native Pine Bush flora and fauna in the area known as he sandy bowl, the depressed area that was formerly the large dune complex that has been mined over the last 150 years.

Creating the levee can be accomplished by moving the existing sand into a long levee to an elevation of approximately 2 to 3 feet high. See Figure 66 for close up view.

Figure 39. Man made lake at Woodlawn Preserve. Current view. Map Source: Google Earth.

Figure 40. Man made lake at Woodlawn Preserve. November 24, 2006. Notice water covers entire sandy bowl area to the southeast and area to the north. Map Source: Google Earth.

Figure 41. Man made lake at Woodlawn Preserve. March 29, 2004. Notice water is at a low point increasing surface area. Map Source: Google Earth.

Figure 42. Man made lake at Woodlawn Preserve. June 29, 2004. Notice water is higher than normal on the north shore and spillover to the east sandy bowl. Map Source: Google Earth.

Figure 43. Man made canal drains the lake into the Lisha Kill. Clogging may be increasing the chances of spillover in the preserve. DEC requires maintenance of this canal. See Figure 66. Photo by Don Rittner

Not everyone agrees that a berm would be beneficial. Botanist Steve Young does not feel it is very natural and is basically creating a lupine garden that may have unintended consequences for the rest of the vegetation. He stresses that the pondshore "is very dynamic and should be left that way because it creates an interesting combination of plants that changes all the time (one year is was dominated by many species of smartweed including the state-rare Carey's smartweed, the next year by boneset) and these would be affected by the berm." He also thinks it would also cause problems in the neighborhood in severe flooding events and perhaps a Corps of Engineers permit would be needed.

To address this question, to alleviate the levee, the wooden trail created would need to be elevated to allow hikers access above the wet areas, and the replanting would be confined to areas on the other side of the elevated trail. This would allow the periodic flooding but would not affect the replanting to the east.

Part of the flooding problem may also be caused by ineffective maintenance of the discharge canal to the Lisha Kill and should be cleaned out each year. The canal should also be cleaned and dead limbs and other items that may impede flow should be removed. The removal of pest vegetation such as water chestnuts should be an annual event. In 2008, City Zoning Officer Steve Strichman led a group of volunteers in an effort to remove a large amount clogging the canal outlet. An effort was made in 2009 as well.

Recommendation Seven (7)

SELECTIVE CUTTING ON DUNE TOP

It is not recommended to use fire to reestablish native Pine Bush species at this time. However, it is recommended that the dune tops located in the lower portion of the preserve near the county line be stripped of recent growth hardwoods and opened to allow more natural sunlight to be exposed, and necessary for the growth of native Pine Bush species. This growth is relatively recent due to fire suppression.

This can be accomplished with work teams cutting recent growth locust, poplar, white pines, and oak other than scrub or dwarf chestnut. The cut wood can be used for trail maintenance.

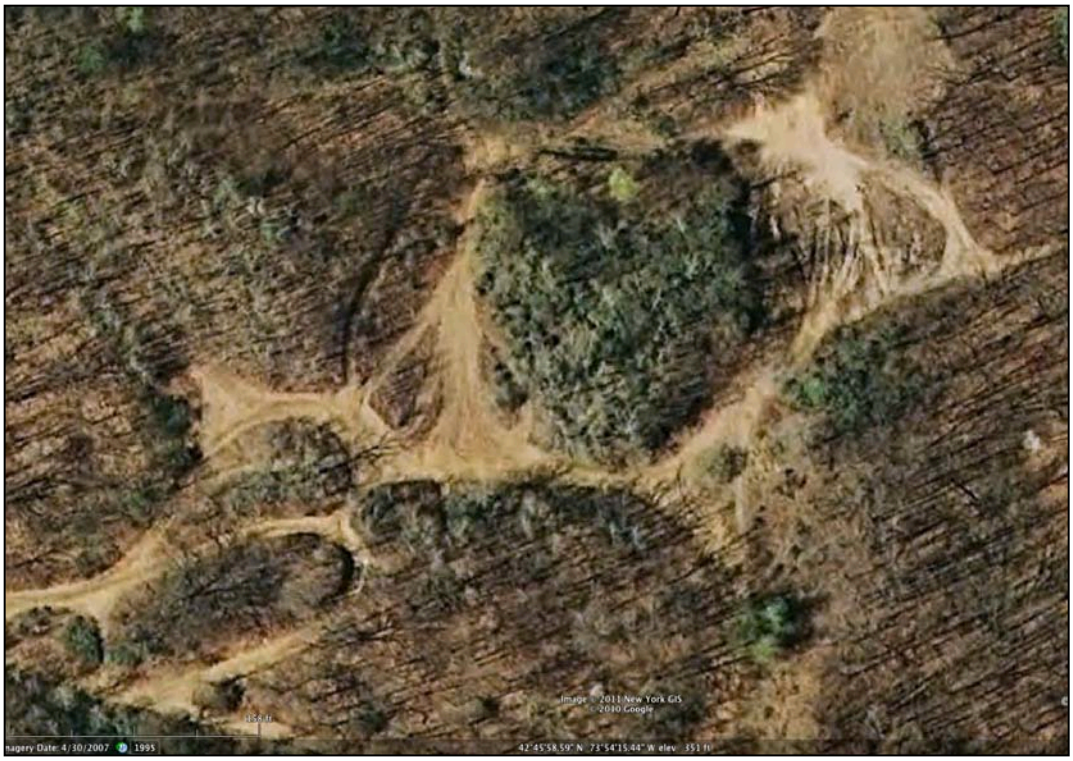


Figure 44. Selective cutting of hardwoods off the dune top will allow pitch pine, scrub oak, heaths, and lupines to grow. Map Source: Google Earth.

Figure 45. Dune Top. Cutting of hardwoods from the dune top will open the area to sunlight for Pine Bush sun loving flora. Photo by Don Rittner.

Figure 46. Area east of the pond (on left) flooding the open area. Tree line on the right has been killed from periodic flooding. The levee/berm will be placed along this route to the left to prevent future flooding and this area will be revegetated with native Pine Bush flora. Photo by Don Rittner.

Figure 47 Additional flooding to the southeast of the pond caused by high water and spillage from the lake. The levee/berm will follow the shoreline here to prevent spillage in the future and the area will be revegetated with native pine bush species. Photo by Don Rittner.

Recommendation Eight (8)

PLANTING AND REESTABLISHING OF NATIVE SPECIES

To insure the reestablishment of native Pine Bush species cooperation has been established with the Cornell Extension Service that runs the Schenectady City Greenhouse in Central Park to help provide suitable locations for germinating native Pine Bush species for reintroduction into the preserve. Krissy Boys Faust from Cornell University in Ithaca has written a propagation handbook on the top ten species and is included in the Natural History section of this report. Cooperation is also expected with the Woodlawn Elementary School located in the preserve. They have provided a Pine Bush Garden in the back of the school and have grown Wild Blue Lupine there. Discussions have also been held with the Albany City Gardner and others.

These organizations and individuals have agreed to provide their expertise and services to the management of the preserve. Ms. Krissy Faust, plant specialist for the Cornell Plantation's Natural Areas has provided a "how to" on preparing and germinating the top ten Pine Bush species to reintroduce into the preserve as suggested by Robert Dirig. These are:

Big Bluestem (Andropogon gerardii)
Butterfly Milkweed (Asclepias tuberosa)
New Jersey Tea (Ceanothus americanus)
Canadian Tick Trefoil (Desmodium canadense)

Bush Clover (Lespedeza capitata)
Wild Blue Lupine (Lupinus perennis)
Spotted Horsemint (Monarda punctata)
Pitch Pine (Pinus rigida),
Dwarf Prairie Willow (Salix tristis)
Little Bluestem (Schizachyrium scoparium)
Scrub (Bear) Oak (Quercus ilicifolia)

The city greenhouse has grown in the past for the Pine Bush Commission lupine, New Jersey tea, bluestem, bush clover, and other species for reintroduction.

The Karner Blue Butterfly

The Karner Blue has become the symbol for the Pine Bush and intensive efforts have been underway to preserve the butterfly and its food sources, with some success in the main Pine Bush Preserve in Albany County.

Our efforts will also be intensive to provide suitable habitat for the Karner Blue which was last seen in the Woodlawn Preserve in 1978 by Don Rittner, although another sighting in the late 1990s had characteristic flight patterns but could not be seen close up to confirm. Blue Lupine, the butterfly's larval food plant was last seen by Rittner in 2003 on a nature hike on the high dune area (see Figure 48). It has since be extirpated from the preserve.

It will be a priority of the management strategy to reestablish the lupine in the sandy bowl area and dune top, along with nectar sources such as New Jersey Tea.

Figure 48. Wild Blue Lupine, the only larval food plant for the endangered Karner Blue Butterfly as photographed by Don Rittner in 2003 on the dune top. Photo by Don Rittner.

Recommendation Nine (9)

SANDY BOWL REVEGETATION

The area to the east of the pond was part of a dune complex of over 400 feet above sea level. This area now is a large expanse of open sandy soil with 100% light penetration. This is an ideal location to reestablish native Pine Bush species including the endangered Karner Blue Butterfly. It is also an area that ATV users love to drive in and create obstacles that they can maneuver around and over.

This area will be divided into three experimental areas and revegetated. Once a sizable blue lupine population is established, Karner Blue butterflies will be reintroduced.

Two new trails will be created. One called the Southern Pond Shore trail will connect the main entrance of Gifford Road to the Northeastern Pond Shore Trail. It will also connect to the Eastern Dune Trail. The main entrance will continue to be the paved road that comes in from Gifford Road and stops about half way down the pond's western tail. The Southern Pond Shore

Trail will be, at times, submerged by high water in the pond, depending on the placement of the levee, so the main paved trail will direct visitors into the preserve.

Figure 49. The Sandy Bowl area is a prime location for bringing back native Pine Bush species including the endangered Karner Blue butterfly. Photo by Don Rittner.

Figure 50. This 2007 aerial view of the Sandy Bowl area shows flooding from the pond. However this is the best place in the preserve to bring back native Pine Bush species including the endangered Karner Blue Butterfly. Map Source: Google Earth.

Figure 51. Showing location of two new trails to connect to existing trails, levee placement and three areas to be restored with native species. Map Source: Google Earth.

Recommendation Ten (10)

TRAIL DEVELOPMENT

There are several existing trails that have been created over the years by hikers, nature lovers and unfortunately off road vehicles. To lower the impact on the wildlife and flora of Woodlawn a few of these trails have been incorporated into the Woodlawn Trail System, and the others will be closed off and left to renew.

Seven trails are proposed. See *A Natural History* by Dirig in this report (page 43) for details of each trail.

The trails should be trimmed back each year and where corduroyed, logs replaced when needed. Carl Olsen from the City Public Works Department as discussed with the county sheriff about having prison inmates help maintain the trails. Local volunteers can also assist.

Each of the trails has a logo or trail marker assigned to them and each trail will be so marked.

A trail guide for public use will also be written, published, and made available to the public.

Figure 52. Part of the Southern Pond Shore trail system showing ATV tire marks. Photo by Don Rittner.

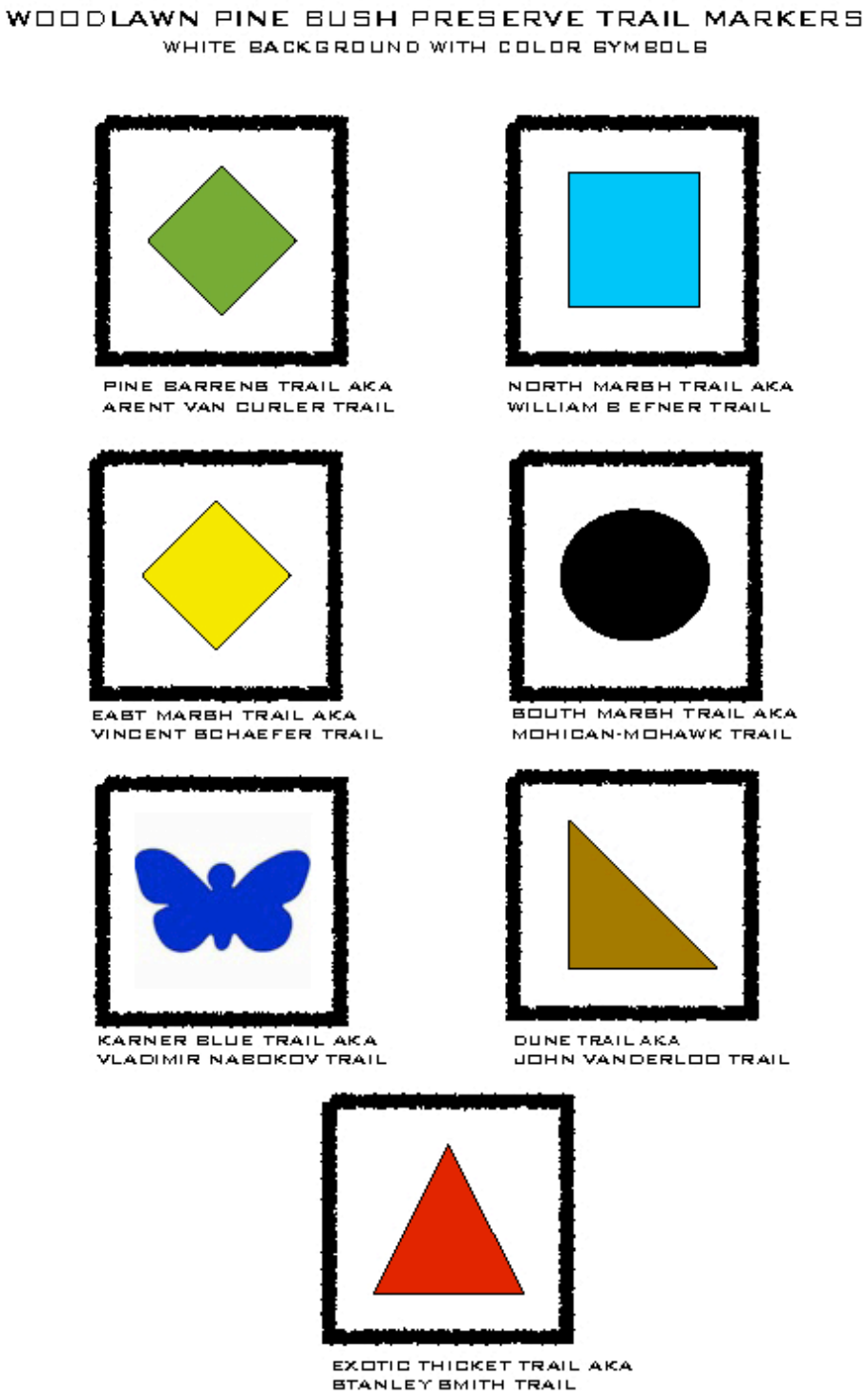


Figure 53. Logos for the trails in the Woodlawn Preserve.

Figure 54. Part of the Eastern Dune Trail showing ATV tracks. Photo by Don Rittner.

Figure 55. A boardwalk like this one in the Bozenkill should be created for the Sandy Bowl area. Should be wide enough for disability access. Photo by Don Rittner

ADDITIONAL TRAIL: NATURE LOVERS WITH DISABILITIES TRAIL

In order to allow all citizens access to the preserve a disabilities trail will be developed from the entrance of the preserve on Gifford Road and run along the paved road that runs along the west trail of the lake. The road lies between the railroad track to the west and the lake to the east. It ends in a turnaround. The pave road is wide enough for two vehicles so meets specifications for handicap access for wheelchairs, etc. Once this section of the preserve is brought back to typical pine barrens flora and fauna, an individual with disabilities will be able to experience the same nature experience any hiker would have further in the preserve: They would have access to both pine barrens and wetland ecosystems.

Figure 56. A paved road runs the length of the west end of the lake in the preserve and will be developed as a persons with disabilities trail. Railroad tracks are on the right while the lake is on the left. Photo by Don Rittner.

Recommendation Eleven (11)

DEVELOP EDUCATIONAL CURRICULUM

Educational curriculum for 4th and 7th grade studies in history and environment of the Preserve will be developed and offered to all Schenectady county schools. Educational videos should be produced that can be placed on Youtube and other social media sites for wider distribution. Educational outdoor programs will be developed for on site educational experience. A

Geocache trail should be developed. Geocaching is a treasure hunting game played with GPS devices. It is played throughout the world by adventure seekers of all ages equipped with a portable GPS device. The basic idea is to locate hidden containers, called geocaches, outdoors and then share your experiences online. For more information on the subject visit the official geocache site at http:// www.geocaching.com/ on the Internet.

Recommendation Twelve (12)

INTERMUNICIPAL MANAGEMENT COMMISSION

If the Towns of Colonie, Rotterdam, and Niskayuna acquire the lands within the study area and recommended in this plan, then an intermunicipal management team should be developed to assure that consistent management techniques will be incorporated throughout the Western Pine Bush Preserve. Where management techniques are compatible with those of the Albany Pine Bush Commission Management Plan it is expected that they would be adopted.

Recommendation Thirteen (13)

POLICE SWEEP

One of the major problems in the preserve is off-road vehicles that rip up the vegetation, create ruts and erosion banks, and create a danger to hikers. In addition, the preserve has become an easy dump for large items like abandoned cars, equipment, and construction debris. Periodic clean ups have reduced this. However the ATV use continues as well as snowmobiles in winter.

It is recommended that a conservation officer be assigned to patrol the area, and that the city police concentrate on sweeping the area for a period of three months straight. In addition, cooperation will be requested from the Railroad Police (CSX), DEC and the police forces of Rotterdam, Niskayuna, and Colonie.

Figure 57. The preserve has become a dumping ground for large items like abandoned cars. Photo by Don Rittner.

Figure 58. Off-road vehicles are illegal but are still being used in the preserve as seen here on November 28, 2010. Rigorous enforcement needs to be improved especially when this section becomes a disabilities trail. Photo by Don Rittner.

Recommendation Fourteen (14)

Boundary Maps

The Preserve and all additions to it shall be posted with the following preserve sign printed on waterproof paper.

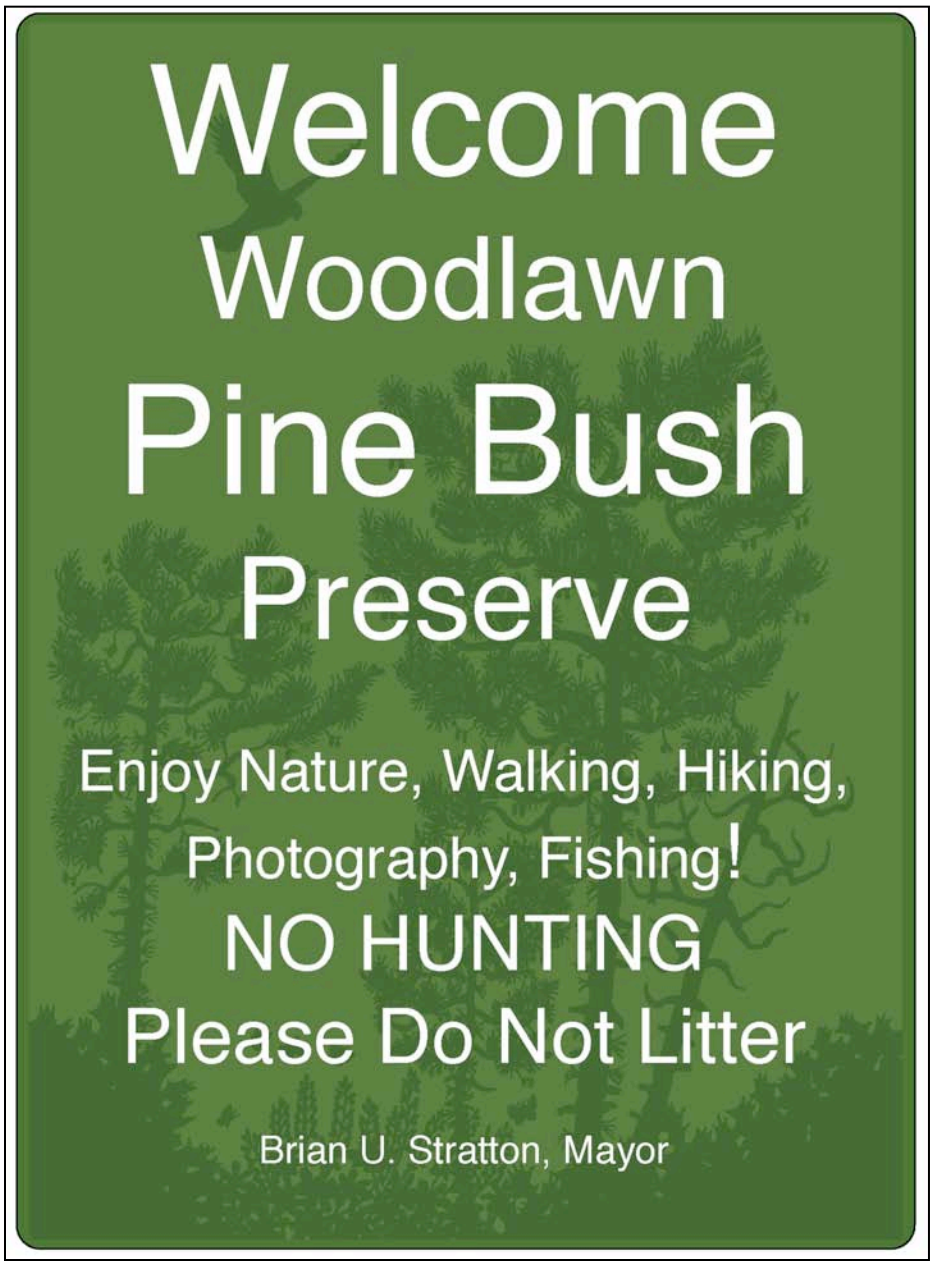


Figure 59. Welcome to the Woodlawn Preserve sign. These have been placed along the preserve boundary.

In addition, the preserve borders shall be posted with a no motorized vehicle sign.

Figure 60. No Motorized vehicle sign. These have been placed along the preserve boundary.

Recommendation Fifteen (15)

PUBLIC WELCOME KIOSK

One official entrance to the preserve should be created and the Gifford Road entrance appears to be most suited. There is ample parking. A wooden kiosk should be placed at the entrance with map, sign-in sheets, trail maps, and overall large map presentation of preserve so that visitors can get a quick visual representation of the preserve.

Jersey barriers should be place along the area around the fence where ATV's currently gain access. A special entrance needs to be constructed that will allow wheelchair access but deter ATV's. It is suggested that communication with specialists in disabilities be consulted for this.

Figure 61. This marker was placed in front of the Albany City Pine Bush Preserve in 1986 but has since been removed by the Albany Pine Bush Commission for no apparent reason. A similar type of sign should be made for the entrance to the Woodlawn Preserve. This sign was designed by Don Rittner. A similar sign should be located at the entrance to Woodlawn Preserve. Photo by John Wolcott.

There is a kiosk and access point to the Callanan Wildlife area on the other side of the railroad tracks through Callanan Industries off Cordell Road. A cooperative agreement with Callanan that would allow visitors to enter their preserve and therefore to the city preserve to the north of theirs should be initiated.

Recommendation Sixteen (16)

FIRE PROGRAM

The Pine Bush ecosystem needs periodic wildfires to maintain the flora and fauna characteristic of the pine barrens environment. Fires have been part of the history of the Pine Bush since its beginnings first caused by lightening strikes, then Native Americans, and finally by Europeans in the later centuries by purpose or accident.

The first prescribed fire in New York State was done by Don Rittner in 1976 on thirty acres of Pine Bush on the property of the University of New York at Albany. A year after the fire, wild lupine had returned in substantial numbers and the following year a sizable Karner Blue Butterfly population was established.

Unfortunately, the university decided to destroy the area and turn it into student housing and the campus of the Atmospheric Science Research Center with no regard to the endangered butterfly population there. At the time of the burning, there were over 100,000 Karner Blues in the Pine Bush proper.

Figure 62. Fire is an important part of maintaining the Pine Bush and will be needed in the future. Photo by Don Rittner.

The Albany Pine Bush Commission has been burning regularly in the Albany County Pine Bush. The Karner Blue is for all practical purposes a minor player in the preserve.

The Woodlawn Preserve will require a prescribed burning program at some time in the future once the native Pine Bush flora and fauna return. However, at the present time, selective cutting of hardwoods and invasive species should be adequate until then. Therefore fire will not be an integral part of the management of the Woodlawn Preserve proper in the immediate future.

The use of herbicides and chemicals will also not be used in the Woodlawn Preserve.

Recommendation Seventeen (17)

EDUCATION AND RESEARCH

The Woodlawn Preserve provides an excellent area for research and partnerships with local colleges should be encouraged. Many thesis have been written on Pine Bush topics from colleges such as the University of New York at Albany and Cornell University, for example. Many of these studies have been published in peer reviewed journals such as the Bulletin of the Torrey Botanical Club, American Midland Naturalist, Plant Ecology, The Journal of Ecology, Journal of Chemical Ecology, Journal of Wildlife Diseases, Conservation Biology and many more.

Research topics include those in history, archeology, natural history, plant ecology, fire ecology, endangered species, island biogeography, surficial and bedrock geology, environmental pollution, water studies, habitat protection, land management, herpetology, mammology, entomology, and many more.

Recommendation Eighteen (18)

HUNTING AND TRAPPING

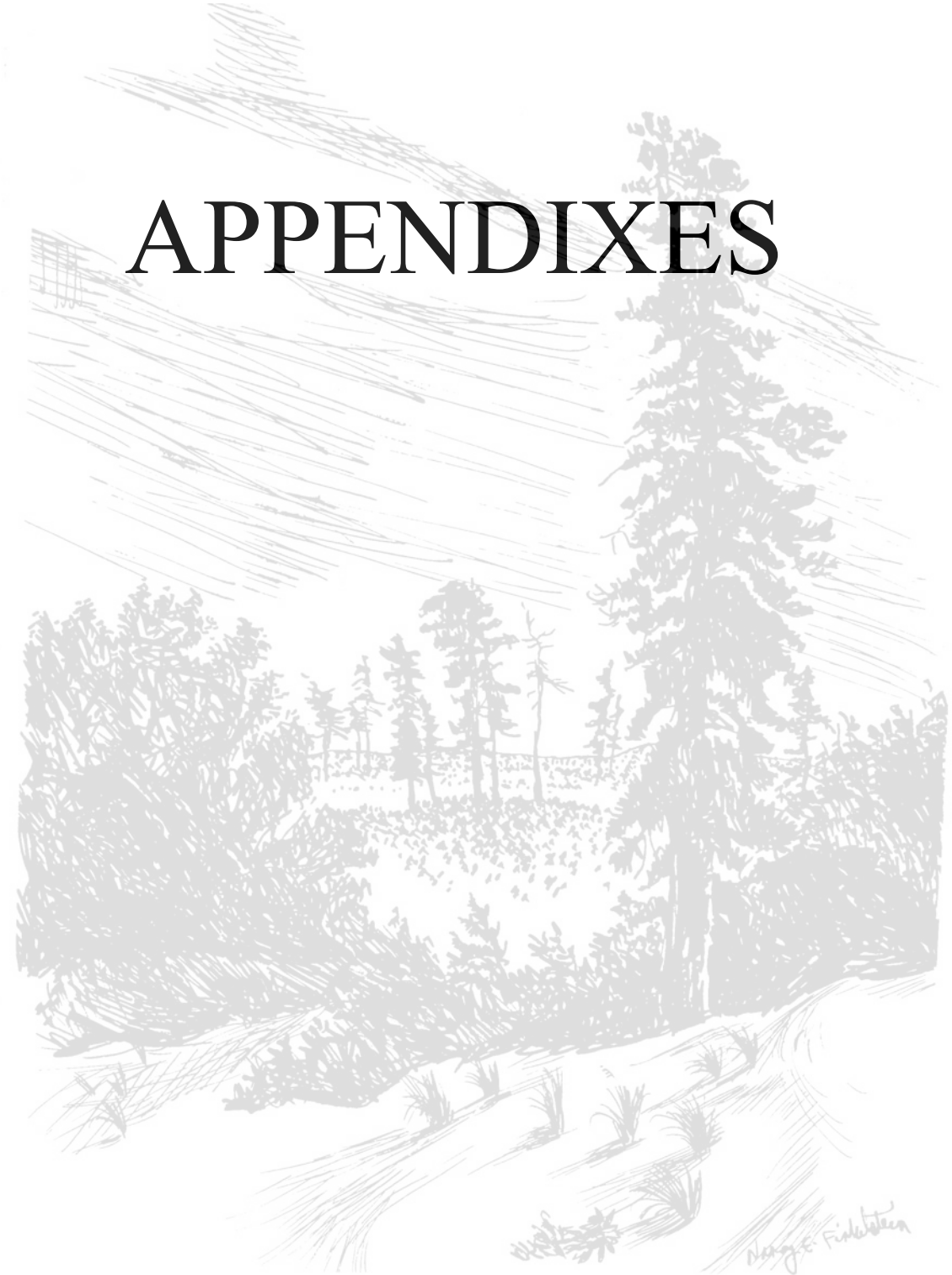
Due to the close proximity to housing, schools, and children, hunting and trapping should not be permitted. Fishing should be permitted in the pond.

Recommendation Nineteen (19)

BIOSWEEP

Beginning in the spring of 2011, an intensive survey of existing flora and fauna should be conducted all year to provide a current data set for restoration and management purposes.

APPENDIXES



Appendix I

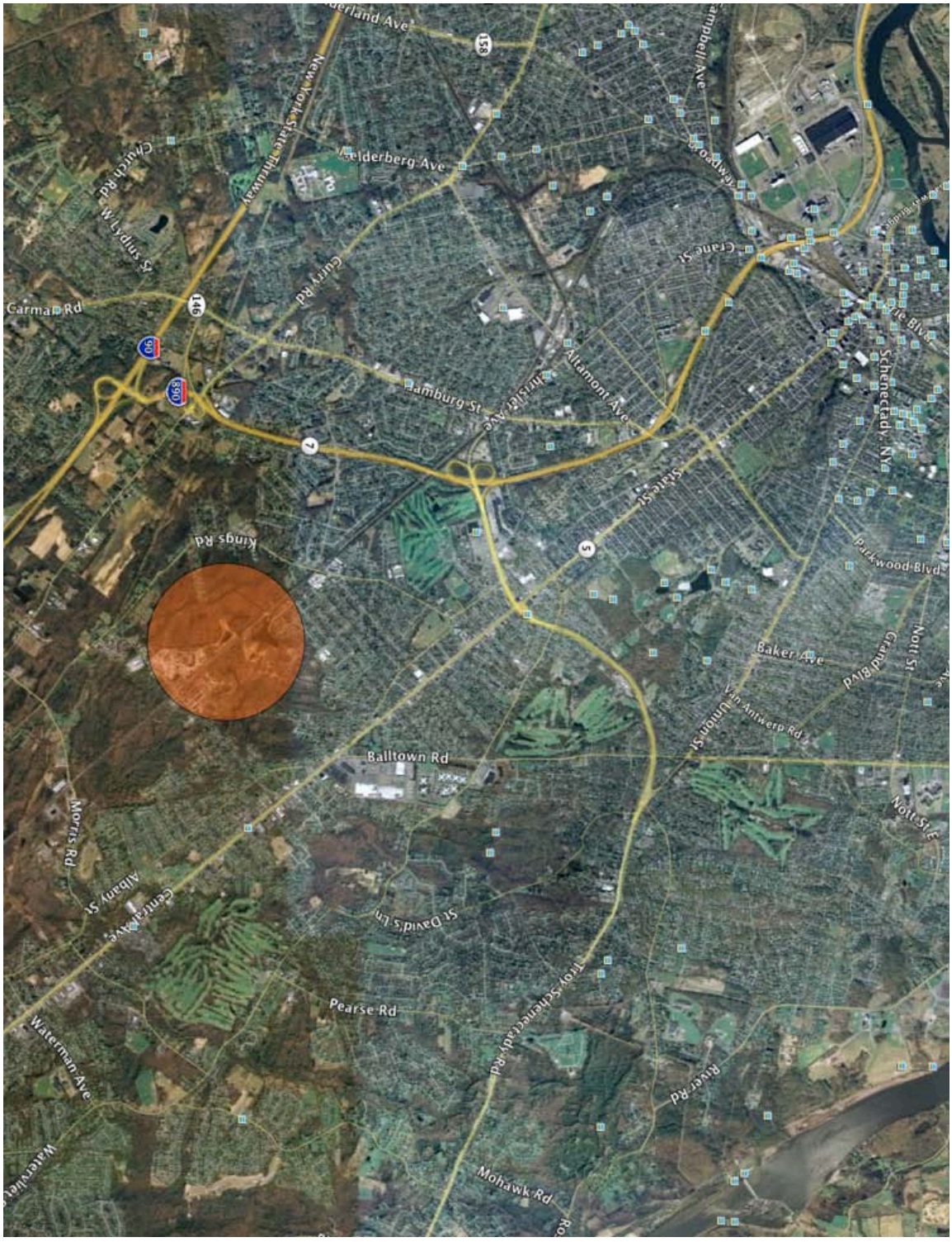


Figure 64. Woodlawn Preserve (Orange) in relation to downtown Schenectady (upper right). Source: Google Earth

Figure 65. Close up view of man made lake and drainage canal. Source: Google Earth.

95-20-6f (7/87)—25c NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPECIAL CONDITIONS

For Article 15 (Title 5: Protection of Water 401 WQC)

4) No other work associated with this project is authorized by this permit. The permittee shall assure that any excess fill to be transported off site will not be deposited in a federal or state wetland or waterway without prior written approval from either the Department of Environmental Conservation and the US Army Corps of Engineers.

5) The permittee shall notify the Department no less than 48 hours prior to the commencement and completion of construction.

OPERATION:

1) The Main Retention Basin as described in the FEIS and on the Record Map 86-554R, Dated 11/10/86 shall be maintained as a wetland ecosystem. The Main Retention Basin, a 100 foot zone around it, Wetland S-5, the portions of Wetland S-4 which are part of the Woodlawn Drainage Project as well as all of the open area depicted on the Record Map as lying to the east of the Main Retention Basin (this area includes the sand dune and "fill area" of its partial reconstruction as well as its Blue Lupine seeding) shall be maintained as permanent open space with no disturbance except for the routine maintenance of the inlet and outlet piping and other structures including inlet drainageways. Publicly owned areas shall be maintained in such public ownership. Those areas within this zone which are in private ownership and not acquired by the permittee, shall be protected by the permittee through the local zoning and planning approval process.

2) As was required by the 1981 DEC permit, the permittee is to prepare and submit to the Department for review and approval a maintenance plan. Such plan shall identify activities needed to maintain the drainage system in good working order including those which will disturb the downstream Lishakill watercourse as well as wetland areas S-4, S-5 and the Main Retention Basin. The emphasis of the plan will be to disturb as little of these areas as possible in accomplishing needed maintenance objectives. Permits needed from either this Department of the Corps of Engineers shall be identified along with projected application submittal dates. This plan shall be submitted by 7/1/92.

DEC PERMIT NUMBER 4-4215-00029/00001-0

FACILITY ID NUMBER Prior Permit 447-99-0052 SP/FWW | PROGRAM NUMBER | Page 4 of 5

Figure 66. Special Use Permit granted by DEC requiring city to maintain Woodlawn Preserve as open space. Source: DEC

Appendix I
ZONING

COLONIE LAND USE LAW
ADOPTED 1-4-07 by LOCAL LAW #1 of 2007

ARTICLE VII – Chapter 190-7 (as last amended 8/28/08 by LL#8-08)

Overlay Districts

A. Overlay Districts Generally.

Overlay districts do not change the use and dimensional requirements of the underlying land use district unless specifically stated in this article. They are not intended to prohibit development, but rather to assure that the siting and design of development is sensitive to environmental and historic resources and constraints.

B. Conservation Development Overlay District.

(1) Purpose. The purpose of the Conservation Development Overlay District is to require the use of conservation development design principles to preserve open space and viable agricultural lands. The Conservation Overlay District is intended to protect the Town's natural environment, provide for a balance between developed and undeveloped land, protect air quality, and to provide adequate open areas for recreation and conservation. Conservation development is a form of design that preserves important natural resources and open space while still allowing for development to occur. The following provisions intend to achieve a balance between well-designed development, meaningful open space conservation, and natural resource protection in the portions of the Town of Colonie covered by the Conservation Development Overlay. Conservation Development will preserve tracts of environmentally, scenically and recreationally significant undeveloped land and preserve contiguous open spaces and important scenic and environmental resources, while allowing compact development and creating more walkable and bike-able neighborhoods.

(2) Applicability. These regulations shall apply to all site plan development and subdivisions of property within the Conservation Development Overlay unless:

(a) The development is a minor site plan development; or

(b) The development is classified as a minor subdivision as defined in the Subdivision Article of this Chapter; or

(c) The Planning Board determines, based upon the conservation analysis outlined below, that there is no reasonable basis for requiring conservation development.

The Board may then approve a conventional development of the site. In order for the Planning Board to make such a determination, the applicant must demonstrate at least one of the following:

[1] The land contains no resources with conservation value;

[2] The acreage is too small to preserve a substantial amount of land with conservation value (this criterion shall not be circumvented by piecemeal subdivision of larger tracts); or

[3] The lot configuration is unique and precludes preservation of a substantial amount of land with conservation value.

(d) In order to make the required showing, the applicant must also demonstrate that the parcel does not adjoin other land that, when combined with open space on the parcel, would result in the preservation of a substantial amount of land with conservation value (including any portion of a designated trail corridor), regardless of whether or not the adjoining parcels have been protected as open space.

(e) An approval of a conservation development shall refer to the conservation findings and may be conditioned upon the protection by conservation easement of portions of the site identified in the conservation analysis and findings as having conservation value.

(3) Standards For Conservation Development.

(a) Density Calculation

[1] Residential. The number of residential units permitted on a lot is calculated following the steps below.

[a] Determine the acreage of unconstrained land on the lot. Unconstrained land is the total acreage of the proposed development parcel excluding Constrained Land.

[b] Determine the number of permitted residential units on the lot. Multiply the acres of unconstrained land by the base residential density for the district, as set forth in the Dimensional Table included in the Dimensional Requirements and Density Incentives Article of this Chapter. Round down fractional units of 0.5 or less and round up fractional units greater than 0.5. The resulting number is the base residential density.

[2] Commercial. The allowable commercial development on a lot is calculated following the steps below.

[a] Determine the acreage of unconstrained land on the lot. Unconstrained land is the total acreage of the proposed development parcel excluding Constrained Land.

[b] Determine the permitted Gross Floor Area on the lot. Multiply the acres of unconstrained land by the base commercial density for the district, as set forth in the Dimensional Table included in the Dimensional Requirements and Density Incentives Article of this

Chapter. Round down fractional units of 0.5 or less and round up fractional units greater than 0.5. The resulting number is the base commercial density.

(b) Density Increase. Pursuant to the Incentives section of this Chapter, the base residential and/or commercial density, as determined above, may be increased.

(4) Conservation Analysis.

(a) As part of its Site Plan or Subdivision Review, an applicant shall prepare a conservation analysis, consisting of inventory maps, description of the land, and an analysis of the conservation value of various site features. The conservation analysis shall show lands with conservation value, including but not limited to the following:

[1] Constrained Land
[2] Open Space and Recreational Resources
[3] Buffer Areas (Define to include screening and environmental buffers)
[4] Land exhibiting present or potential recreational, historic, archeological, ecological, agricultural, water resource, scenic or other natural resource values.

(b) The conservation analysis shall describe the importance and the current and potential conservation value of all land on the site. In the course of conceptual site plan or subdivision review, the Planning Board shall indicate to the applicant which of the lands identified as being of conservation value are most important to preserve.

(c) The outcome of the conservation analysis and the Planning Board's determination shall be the identification of land to be preserved by a permanent easement. The conceptual site plan or subdivision plan shall also show preferred locations for intensive development as well as acceptable locations for less dense development.

(d) The final determination as to which land has the most conservation value and should be protected from development shall be made by the Planning Board. Whenever the Planning Board approves a plan with protected open space, it shall make written findings identifying the specific conservation values protected and the reasons for protecting such land (the "conservation findings"). The Planning Board shall not approve development without a complete conservation analysis sufficient for the Board to make its conservation findings.

(e) The Planning Board may determine that limited areas of constrained land may be disturbed in order to secure a reasonable development of the site, consistent with the findings of the conservation analysis. In that event, a portion of the site twice the area of the constrained lands to be disturbed shall be set aside from the lands identified as being of conservation value, and treated as constrained lands for the purposes of the density calculation and concept plan preparation.

(f)

Figure 71. Special Use Permit granted by DEC requiring city to maintain Woodlawn Preserve as open space. Source: DEC

(g) The Conceptual Plan shall show the constrained land identified by the analysis described above, and at least 40% of the land not constrained as land to be preserved.

(5) Lot Sizes in Conservation Subdivisions.

(a) After the final residential and/or commercial densities are determined, there shall be no mandatory minimum lot size in a conservation development. The Planning Board shall determine appropriate lot sizes in the course of its review.

(b) In order to permit a clustered lot configuration, wells and septic systems may be located in common areas of protected open space, provided that necessary easements are provided for maintenance of these facilities.

(6) Other Area and Dimensional Requirements.

(a) There shall be no minimum required area, bulk, or dimensional standards in a conservation development, except that where such development abuts an existing single family dwelling, a suitable buffer area shall be required by the Planning Board.

(b) The applicant shall specify dimensional requirements for a proposed conservation subdivision by identifying setbacks and other lot dimensions to be incorporated into the final site plan or subdivision plan, subject to review and approval by the Planning Board.

(7) Conservation Development Design.

(a) Compliance with subdivision rules and regulations. All requirements of the rules and regulations of the Planning Board with respect to the development and approval of subdivision plans shall be complied with except insofar as the same may conflict with specific requirements set forth herein. Where the requirements of this article conflict with those contained in the subdivision regulations of this Chapter, the specific requirements set forth in this article shall control.

(b) Lots shall be arranged in a manner that protects land with conservation value and facilitates pedestrian and bicycle circulation. Permitted building locations or areas (“building envelopes”) shall be shown on the final site plan and/or subdivision plan.

(c) Parking. Parking spaces shall be a minimum of nine feet wide and eighteen feet long. Each dwelling unit shall have at least two exterior, off-street parking spaces. Common parking areas shall also be provided, with at least 1/2 additional parking space for each dwelling unit. These common parking areas shall be no further than 250 feet from the dwelling unit they are intended to serve. The Planning Board may waive the requirement for common parking areas if the applicant demonstrates that sufficient exterior, off-street parking is available on the individual lots. Curbing, fencing, or other physical barriers shall

be provided as approved by the Planning Board to prevent encroachment onto landscaped areas by vehicles.

(d) Snow clearance and removal. The means employed to remove snow and ice from sidewalks, parking lots, and driveways must be sufficient to safely and adequately handle the volume of snow and ice reasonably anticipated to be deposited by nature on the site, without subjecting green space areas to damage, and while maintaining the minimum required parking spaces. Provisions for winter snow storage for common parking areas shall be included as an integral part of the project plan, and such snow storage provisions shall not reduce the number of parking spaces beyond the minimum number established by these rules. A plan for snow removal rather than storage shall not be an acceptable alternate.

(e) Design elements review. The design elements of the project shall be in harmony with the natural environment and in keeping with the character of the adjacent land uses.

(8) Special Standards for Areas Influenced by Albany Pine Bush Preserve.

(a) Native Albany Pine Bush species will be used to landscape new commercial, industrial and residential buildings to the greatest extent practicable. New landscaping shall not consist of known invasive species. A list of native Albany Pine Bush species shall be made available at the applicant's request.

(b) Sufficient open space shall be provided to permanently protect ravines, major dunes, pine-barrens vernal ponds, rare and endangered species habitat, or to connect other preservation lands. All development proposals will be designed in such a way as to ensure the proper management of the open space lands and shall be consistent with the Conservation Development concept. Protection efforts can include, but are not limited to land dedications to the Albany Pine Bush Preserve, set-asides, donations, and conservation easements.

(c) Where practical, parking shall be provided by several small lots as opposed to one large one.

(d) There should be no general leveling and clearing of any site. Construction should follow the contour of the land and not destroy trees or natural features except where necessary for the building of foundations and approved parking and paved areas.

(e) All lighting fixtures used to provide exterior security or parking lot lighting shall utilize high pressure sodium vapor lights as opposed to mercury vapor or other lighting fixtures and otherwise comply with Town lighting requirements. The use of excessive dusk-to-dawn exterior lighting shall be discouraged.

(f) Where practical and when excess sand from projects is available applicants should consider donating such excess sand to the Albany Pine Bush Preserve Commission.

(9) Road Standards. Notwithstanding any other road construction requirements promulgated by the Town of Colonie, the size of roads built within conservation subdivisions may be reduced at the discretion of the Planning Board and with approval of the Superintendent of Highways.

(10)Permanent Open Space. Open space set aside in a Conservation Development shall be permanently preserved. The open space protected pursuant to this Article must have "conservation value," which shall be determined in the course of the conservation analysis described above.

(11)Preservation by Permanent Easement.

(a) A perpetual easement restricting development of the open space land and allowing use only for agriculture, forestry, passive recreation, protection of natural resources, or similar conservation purposes, shall be granted to the Town, with the approval of the Town Board, and/or to a qualified not-for-profit conservation organization acceptable to the Planning Board. Such easement shall be approved by the Planning Board and shall be required as a condition of Final approval. The Planning Board shall require that the easement be enforceable by the Town if the Town is not the holder of the easement. The easement shall be recorded in the County Clerk's Office.

(b) The easement shall prohibit residential, industrial, or commercial use of open space land (except in connection with agriculture, forestry, and passive recreation), and shall not be amendable to permit such use. Driveways, wells, underground sewage disposal facilities, local utility distribution lines, stormwater management facilities, trails, and agricultural structures shall be permitted on preserved open space land with Planning Board approval, provided that they do not impair the conservation value of the land. Forestry shall be conducted in conformity with applicable best management practices as described by the NYS Department of Environmental Conservation's Division of Lands and Forests.

(c) A land management plan, approved by the Planning Board, may be required. The easement shall provide that if the Town Board finds that the management plan has been violated in a manner that renders the condition of the land a public nuisance, the Town may, upon 30 days written notice to the owner, enter the premises for necessary maintenance, and that the cost of such maintenance by the Town shall be assessed against the landowner or, in the case of a Homeowners' Association (HOA), the owners of properties within the development, and shall, if unpaid, become a tax lien on such property or properties.

(d) Preserved open space may be included as a portion of one or more large lots, or may be contained in a separate open space lot. The easement may allow dwellings to be constructed on portions of lots that include preserved open space

land, provided that the total number of dwellings permitted by the easement in the entire subdivision is consistent with applicable density limitations.

(12)Ownership of Open Space Land.

(a) Open space land shall under all circumstances be protected by a perpetual easement, but may be owned by an HOA, offered for dedication to Town, County, or State governments, transferred to a not-for-profit organization acceptable to the Planning Board, held in private ownership, or held in such other form of ownership as the Planning Board finds appropriate to properly manage the open space land and to protect its conservation value.

(b) If the land is owned by an HOA, such HOA shall be established in accordance with the following:

[1] The HOA application must be submitted to the NYS Attorney General's Office before the approved subdivision final plan is signed, and must comply with all applicable provisions of New York State law. The HOA must be approved by the NYS Attorney General's Office prior to issuance of the first building permit.

[2] Membership must be mandatory for each lot owner, who must be required by recorded covenants and restrictions to pay fees to the HOA for taxes, insurance, and maintenance of common open space, private roads, and other common facilities.

[3] The HOA must be responsible for liability insurance and property taxes for common lands, and the maintenance of recreational facilities, private roads, driveways and parking areas, and other common facilities.

[4] Property owners must be required to pay their prorated share of the costs, and the assessment levied by the HOA must be able to become a lien on the individual homeowners' properties.

[5] The HOA must be able to adjust the assessment to meet changed needs.

[6] The applicant shall make a conditional offer of dedication to the Town binding upon the HOA for all open space intended to be conveyed to the HOA. The filing in the County Clerk's office of a subdivision map depicting such open space shall be considered an offer of dedication. Such offer may be accepted by the Town, at the discretion of the Town Board, upon the failure of the HOA to take title to the open space from the applicant or other current owner, upon dissolution of the association at any future time, or upon failure of the HOA to fulfill its maintenance obligations hereunder or to pay its real property taxes.

[7] Ownership shall be structured in such a manner that real property taxing authorities can satisfy property tax claims against the open space lands by proceeding against individual owners in the HOA and the dwelling units they each own.

[8] The Town Attorney's Office shall find that the HOA documents presented satisfy the conditions above, and such other conditions as the Planning Board shall deem necessary.

(13) Conservation Development Procedures. The conservation development shall follow the same Site Plan and/or Subdivision process contained in this Chapter subject to the additional provisions contained herein.

C. Historic Overlay District.

The purpose of the Historic Overlay District is to recognize the importance of the Loudon Road Historic District and the Watervliet Shaker Historic District.

D. Airport Noise Impact Overlay Districts: special conditions and restrictions.

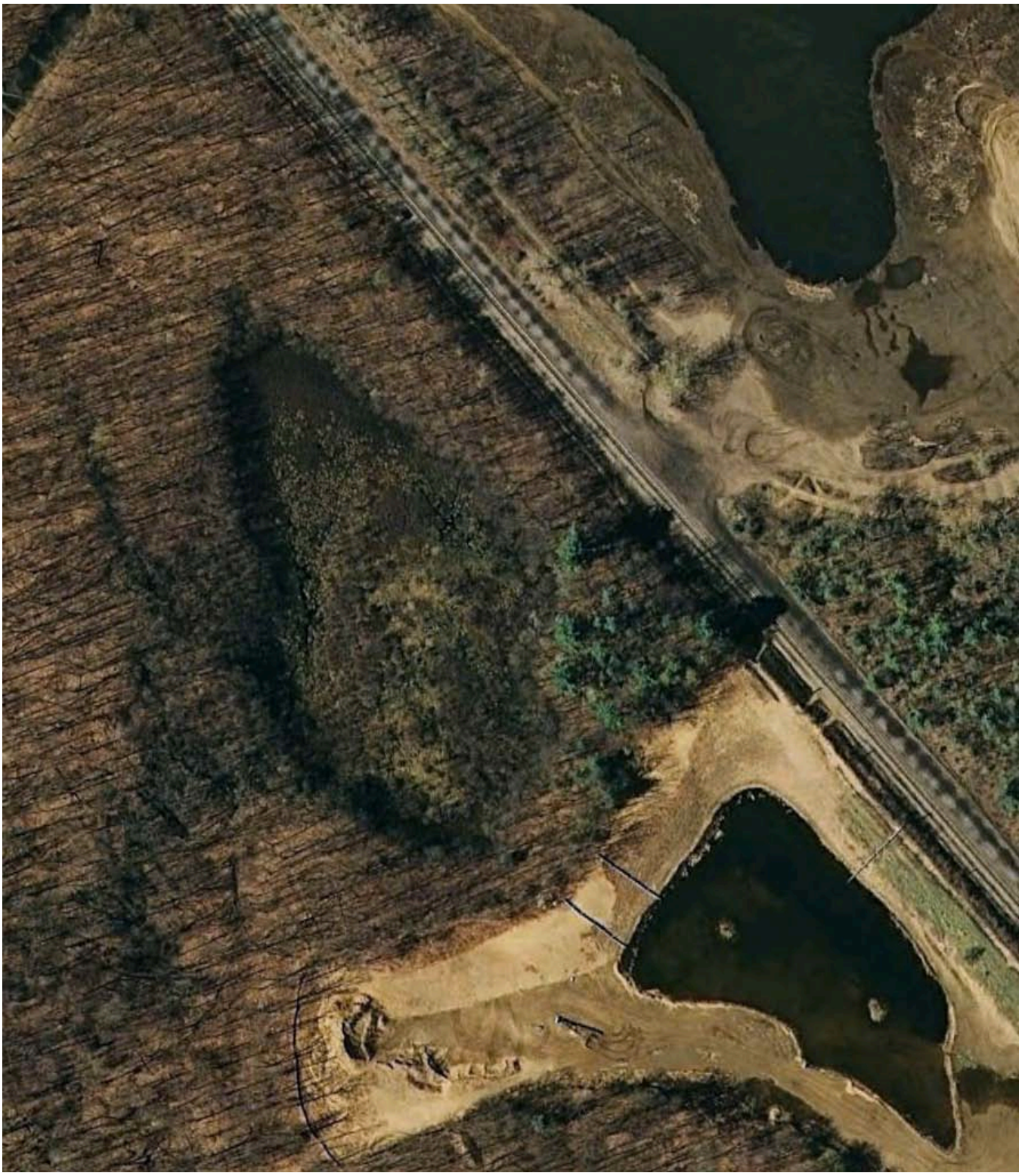
(1) District Limits. The limits of the Airport Noise Overlay Districts shall be the boundaries of the Year 2000 65-70 DNL and 70+ DNL noise impacts areas, as delineated in the Albany County Airport F.A.R. Part 150 Noise Compatibility Study Record of Approval. DNL noise levels represent a twenty-four-hour average sound level, in decibels, averaged over a year, with 10 decibels added for noise occurring between 10:00 p.m. and 7:00 a.m.

(2) Land Use and Standards Table.

In order to protect the public from conflicts arising due to incompatible land uses being developed adjacent to the Albany International Airport, the uses otherwise permitted within any district shall, when lying within an Airport Noise Impact Overlay District, be subject to conditions and restrictions as set forth in the following table:

Land Use and Standards for the Year 2000 65 to 70 and 70 + DNL Boundaries

Land Use[1]	Proposed 65 to 70 DNL Overlay	Proposed 70+ DNL Overlay
Residential		
Single units, detached	Y[2]	N
Single units, semidetached	Y[2]	N
Single units, attached row	Y[2]	N
Two units, side by side	Y[2]	N
Two units, one above the other	Y[2]	N



Apartments, walk-up	Y[2]	N
Apartments, elevator	Y[2]	N
Group quarters	Y[2]	N

Residential hotels	Y[2]	N
Mobile home park or courts	N	N
Transient lodgings	Y[2]	N
Other residential	Y[2]	N
Manufacturing		
Food and kindred products	Y	Y[3]
Textile mill products	Y	Y[3]
Apparel and other finished products made from fabrics, leather, and similar materials	Y	Y[3]
Lumber and wood products (not furniture)	Y	Y[3]
Furniture and fixtures	Y	Y[3]
Paper and allied products	Y	Y[3]
Printing, publishing, and allied	Y	Y[3]
Chemicals and allied products	Y	Y[3]
Petroleum refining and related industries	Y	Y[3]
Rubber and miscellaneous plastic products	Y	Y[3]
Stone, clay, and glass products	Y	Y[3]
Primary metal industries	Y	Y[3]
Fabricated metal products	Y	Y[3]
Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks	Y	Y[3]
Miscellaneous manufacturing	Y	Y[3]
Transportation, Communication, and Utilities		
Railroad, rapid rail transit, transit and street railway transportation	Y	Y[3]
Motor vehicle transportation	Y	Y[3]
Aircraft transportation	Y	Y[3]
Marine craft transportation	Y	Y[3]
Highway and street right-of-way	Y	Y[3]
Automobile parking	Y	Y[3]
Communication	Y	Y[3]
Utilities	Y	Y[3]
Other transportation, communication, and utilities	Y	Y[3]
Trade		
Wholesale trade	Y	Y[3]
Retail trade, building materials, hardware, and		

farm equipment	Y	Y[3]
Retail trade, general	Y	Y[3]
Retail trade, food	Y	Y[3]
Retail trade, automotive, marine craft, aircraft, and accessories	Y	Y[3]
Retail trade, apparel and accessories	Y	Y[3]
Retail trade, furniture and furnishings	Y	Y[3]
Retail trade, eating and drinking establishments	Y	Y[3]
Other retail trade	Y	Y[3]
Services		
Finance, insurance, and real estate	Y	Y[3]
Personal services	Y	Y[3]
Cemeteries	Y	Y[3]
Business services	Y	Y[3]
Repair services	Y	Y[3]
Professional services	Y	Y[3]
Hospitals, nursing homes	N	N
Other medical facilities	Y[4]	Y[5]
Contract construction services	Y	Y[3]
Governmental services	Y	Y[3]
Educational services	N	N
Miscellaneous	Y	Y[3]
Cultural and Recreational		
Cultural activities (including churches)	N	N
Nature exhibits	Y[4]	N
Public assembly	N	N
Auditoriums, concert halls	N	N
Outdoor music shells, amphitheaters	N	N
Outdoor sports arenas, spectator sports	N	N
Amusements	Y[4]	Y[5]
Recreational activities (including golf courses, riding stables, water recreation)	Y[4]	Y[5]
Resorts and group camps	N	N
Parks	Y	Y[5]
Other cultural, entertainment	Y[4]	N
Resource Production/Extraction		
Agriculture (except livestock)	Y[6]	Y[7]
Livestock farming, animal breeding	Y[6]	Y[7]

Agricultural-related activities	Y	Y[7]
Forestry activities and related	Y	Y[7]
Fishing activities and related	Y	Y
Mining activities and related	Y	Y
Other resource production and extraction	Y	Y

TABLE KEY:

Y (Yes): This land use and related structures are compatible without restrictions.

N (No): This land use and related structures are not compatible and shall be prohibited.

NLR (Noise Level Reduction): noise level reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

Y(*) (Yes, with restrictions): Land use and structures generally compatible; see Notes.

dBA: A sound pressure level designed to approximate the response of the human ear to sound; dBA is a unit of measure of a sound expressed from a calibrated sound level meter utilizing an A-level weighting scale.

NOTES:

1. The Standard Land Use Coding Manual, first published by the Urban Renewal Administration in 1965, is the source of the classification system used in this section. This system was also used in the model ordinance included within the Albany County Airport: F.A.R. Part 150 Noise Compatibility Study.
2. Measures to achieve outdoor to indoor noise level reduction (NLR) of at least 25 decibels shall be incorporated into the design and construction of buildings to achieve an interior noise level of 40 dBA.
3. Measures to achieve NLR of at least 25 decibels must be incorporated into the design and construction of portions of any buildings where the public is received, office areas, and other noise sensitive areas to achieve an interior noise level of 45 dBA.
4. Measures to achieve NLR of at least 25 decibels must be incorporated into the design and construction of portions of any buildings where the public is received, office areas, and other noise sensitive areas to achieve an interior noise level of 40 dBA.
5. Measures to achieve NLR of at least 30 decibels must be incorporated into the design and construction of portions of any buildings where the public is received, office areas, and other noise sensitive areas to achieve an interior noise level of 40 dBA.
6. Residential buildings require an NLR of at least 25 decibels to achieve an interior noise level of 40 dBA.
7. Residential buildings not permitted.

(3) Exempt uses. The following uses shall be exempt from these conditions and restrictions:

(a) Existing uses: Uses existing on the effective date of this Chapter shall not be required to change in order to comply with these regulations. The nonconforming use requirements of this chapter shall apply to the future applicability of the standards and requirements contained herein.

(b) Temporary uses: temporary uses, including but not limited to public celebrations and outdoor entertainment events, so long as the period of operation does not exceed five days. A variance may be requested to extend the time period for a temporary use.

(c) Temporary structures: temporary buildings and structures that are not used for residential purposes and which meet applicable requirements as contained within this chapter, so long as such uses and associated structures are constructed incidental to a permitted use, as per the requirements of this chapter.
(d) Accessory uses and structures: accessory uses and structures incidental to a permitted principal structure or use and within the intent, purposes, or objectives of these regulations.
(e) Historic structures: Structures listed on the National Register of Historic Places, or on official state or local registers of historic places, may be exempt from the sound insulation requirements of this section if they compromise the architectural or historic integrity of the buildings.

(4) Relation to existing laws, ordinances, and regulations. This section shall not be construed to repeal the provisions of existing laws, ordinances, and regulations established by housing, building, and zoning requirements for the Town. When the underlying zoning and the overlay zoning are in conflict or are not consistent, the most restrictive regulations shall apply.

E. Administration and Enforcement.

(1) The provisions of this article with respect to Conservation Overlay Districts shall be primarily administered and enforced by the PEDD, which shall have the power to make necessary inspections.
(2) The provisions of this article with respect to Airport Noise Impact Overlay Districts shall be primarily administered and enforced by the Building Department, which shall have the power to make necessary inspections.

CO –Commercial Office

PERMITTED USES:

- Amusement Use (Indoor)
- Bank
- Christmas Tree Sales
- Community Center
- Convenience Store
- Convention & Exhibit Ctr.
- Cultural Venue
- Daycare Center
- Elder Care Use
- Farm
- Fire Station
- Funeral Home
- Golf Course
- Health Club
- Hospital
- Hotel
- Library
- Motor Vehicle Rental Agency
- Municipal Uses
- Nursery
- Nursing Home
- Office (Medical)
- Office (Professional or Business)
- Park
- Personal Services Uses
- Place of Worship
- Pre-School
- Private Club
- Recreation Field
- Research & Development Laboratory
- Restaurant
- Personal Service Business
- School
- Service Business
- Shipping Store (Retail)
- Veterinarian

PERMITTED ACCESSORY USES:

- Daycare (Home)
- Drive Thru Use
- Dwelling (Single Family Farmhouse)
- Fast Food Establishment
- Fraternity or Sorority House
- Garage Sale
- Home Occupation (Level 1)
- Home Occupation (Level 2)
- Pre-School (Accessory)

PERMITTED BY SPECIAL USE PERMIT:

- Telecommunications Tower

ADDITIONAL USE STANDARDS, RESTRICTIONS, AND EXCEPTIONS:

- In any district, a single family dwelling or a pre-school shall be permitted as an accessory use to a school or place of worship.
- In any district, an accessory dwelling unit, if accessory to a single-family or two-family dwelling.
- In any district, no oversized vehicle shall be parked on any public street or in the street right-of-way, except vehicles actively assisting in an emergency such as a fire or traffic accident, or vehicles such as moving vans or delivery trucks in the process of being loaded or unloaded.
- In a CO, COR, HCOR, NCOR, or OR District, storage of construction materials, equipment, and/or vehicles shall not be permitted as an accessory use to an office.
- In any district, any adult establishment shall be subject to the provisions of the General Regulations Article of this Chapter with respect thereto.
- In any district, no portion of any building or structure occupied by a restaurant, bar, fast-food, nightclub, convenience food store, supermarket, mini-mart, motor vehicle service station, or motor vehicle repair shop use, nor any related waste, refuse, or recycling containers, motor vehicle fuel dispensers, motor vehicle fuel storage, or related accessory uses such as car washes, vacuum pumps, or air pumps, shall be located within 200 feet of the zone boundary line of any Single Family Residence District or Multi- Family Residence District.
- In areas where OR, CO, NCOR, COR, HCOR, Airport Business Area, and Industrial Districts are more than 300 feet in depth from the front lot line, no portion of any non-residential use or mixed-use building shall be erected within 100 feet, and no parking,

loading, or storage area shall be located within 50 feet, of the zone boundary line of any Single Family Residence District or Multi- Family Residence District.

Private Club

- Any such club shall be incorporated pursuant to the provisions of the Not-for-Profit Corporation Law, and cater exclusively to members and their guests, or shall be an unincorporated association subject to review by the Planning Board, which caters exclusively to members and their guests.
- Any such use shall not be conducted as a business enterprise.
- Layout, architectural design and landscaping of the proposed facility must be compatible with the environmental character of the surrounding neighborhood.
- Club activity shall be indoor only.

Recreation Field

- Outdoor facilities that may be expected to have intensive use shall be screened from public view and from adjacent properties by trees, hedges or other suitable shrubbery.
- Outdoor lighting shall be limited to that necessary for operational reasons and shall be so designed as to not be incompatible with surrounding land uses.
- Outdoor public address systems, entertainment or other sounds shall be controlled so that they shall not be heard beyond the facility's property lines.
- One announcement sign, not over 12 square feet in area, shall be permitted on each street frontage of the facility's property, provided that it is set back at least 24 feet from all property lines. Such sign may be lighted only by a shielded light source attached to the sign.

Veterinarian

- All animal hospital facilities shall be maintained in enclosed structures which shall be of soundproof construction and so maintained as to produce no dust or odors at the property line.
- Exercise pens and runways shall not be permitted within 200 feet of any lot line or within 300 feet of any residential district.
- Permitted operations shall not include the boarding of animals or the operation of a kennel, except that the boarding of animals related to a course of medical treatment shall be permitted during the period of such treatment.
- There shall be proper facilities and personnel to ensure that trash, animal waste, and other debris generated by the facility are properly disposed of.
- Outdoor storage of refuse, feed, or other material and on-site incineration of refuse are not permitted.
- An odor-absorbing air-filtration system must be used.
- Plans and specifications must be certified by an acoustical engineer that the proposed structure will provide adequate sound absorption.

LC – Land Conservation

PERMITTED USES:

- Farm
- Fire Station
- Municipal Uses
- Nursery
- Park

PERMITTED ACCESSORY USES:

- Dwelling (Single Family Farmhouse)
- Farm Stand

PERMITTED BY SPECIAL USE PERMIT:

- Recreation Field

ADDITIONAL USE STANDARDS, RESTRICTIONS, AND EXCEPTIONS:

- In any district, a single family dwelling or a pre-school shall be permitted as an accessory use to a school or place of worship.
- In any district, an accessory dwelling unit, if accessory to a single-family or two-family dwelling.
- In any district, no oversized vehicle shall be parked on any public street or in the street right-of-way, except vehicles actively assisting in an emergency such as a fire or traffic accident, or vehicles such as moving vans or delivery trucks in the process of being loaded or unloaded.
- In any district, no oversized vehicle shall be parked or stored in the front yard of any single-family or two-family residence unless the vehicle is registered and insured.
- In any district, any adult establishment shall be subject to the provisions of the General Regulations Article of this Chapter with respect thereto.

Recreation Field

- Outdoor facilities that may be expected to have intensive use shall be screened from public view and from adjacent properties by trees, hedges or other suitable shrubbery.
- Outdoor lighting shall be limited to that necessary for operational reasons and shall be so designed as to not be incompatible with surrounding land uses.
- Outdoor public address systems, entertainment or other sounds shall be controlled so that they shall not be heard beyond the facility's property lines.
- One announcement sign, not over 12 square feet in area, shall be permitted on each street frontage of the facility's property, provided that it is set back at least 24 feet from all property lines. Such sign may be lighted only by a shielded light source attached to the sign.

SFR – Single Family Residential

PERMITTED USES:

- Dwelling (Single Family)
- Farm
- Fire Station
- Golf Course
- Municipal Uses
- Nursery
- Park
- Place of Worship
- School

PERMITTED ACCESSORY USES:

- Daycare (Home)
- Dwelling Unit (Accessory)
- Dwelling (Single Family Farmhouse)
- Farm Stand
- Fraternity or Sorority House
- Garage Sale
- Home Occupation (Level 1)

PERMITTED BY SPECIAL USE PERMIT:

- None

ADDITIONAL USE STANDARDS, RESTRICTIONS, AND EXCEPTIONS:

- In any district, a single family dwelling or a pre-school shall be permitted as an accessory use to a school or place of worship.
- In any district, an accessory dwelling unit, if accessory to a single-family or two- family dwelling.
- In any district, no oversized vehicle shall be parked on any public street or in the street right-of-way, except vehicles actively assisting in an emergency such as a fire or traffic accident, or vehicles such as moving vans or delivery trucks in the process of being loaded or unloaded.
- In any district, no oversized vehicle shall be parked or stored in the front yard of any single-family or two-family residence unless the vehicle is registered and insured.
- In any district, no oversized vehicle shall be parked or stored in the front yard of any single-family or two-family residence unless the vehicle is registered and insured.
- In SFR and MFR districts, no vehicle or equipment used primarily for commercial or other non-residential purposes shall be parked or kept on any lot, or on any Street or in the Street right-of-way, except:
  (a) vehicles or equipment actively assisting in an emergency such as a fire or traffic accident;
  (b) vehicles or equipment used in connection with active, permitted construction or maintenance activities on the lot or adjacent Street;
  (c) vehicles such as moving vans or delivery trucks being loaded or unloaded; or

(d) vehicles with a maximum gross vehicle weight rating of 10,000 pounds, used by a business owner or employee for transportation between their home and their place of employment.

- In SFR and MFR districts, no structure accessory to a golf course shall be erected within 200 feet of the boundary of the property devoted to such use, and no accessory parking area shall be located within 100 feet of said boundary.

In any district, any adult establishment shall be subject to the provisions of the General Regulations Article of this Chapter with respect

City of Schenectady

§ 264-6. OS Recreation and Open Space District.
A. Purpose. The Recreation and Open Space (OS) District is intended to preserve and enhance those publicly owned lands with significant recreational facilities or amenities, with open space characteristics or with features of topography, drainage, floodplains, aquifer areas or other natural features that preclude intense use.

§ 264-7. R-1 Single-Family Residential District.
A. Purpose. Single-Family Residential (R-1) District is intended to maintain the residential quality and desirability of areas characterized primarily by owner-occupied single-family detached dwellings and where suitable, to provide areas for single-family residential development.

And off towards Kings road there is some:
§ 264-18. M-1 Light Manufacturing and Warehousing District.
A. Purpose. The Light Industrial (M-1) District is intended to provide areas where light manufacturing, warehousing and business establishments may locate. Uses in the M-1 District themselves require protection from the potential adverse impact of heavier industrial uses, and therefore, such heavier industrial uses have been excluded from the M-1 District. The M-1 District is intended to be located primarily in those areas that are not residentially developed.

Town of Niskayuna

The area located within the project area in the Town of Niskayuna is zoned L-C: Land Conservation. Permitted uses in the zoning district are as follows:

Single family detached dwellings on 5 acres or more of land
Research Libraries on 2 acres or more of land
Agricultural operations on 10 acres or more of land
Bird sanctuary, camping grounds, hiking trails, nature preserves, parks scenic areas or other similar uses on 5 acres or more of land.

Town of Rotterdam

Agricultural District

For additional regulations relative to special uses, see Article **XIX**. **[Amended 4-26-1989 by L.L. No. 6-1989]**

The following regulations shall apply to all A (Agricultural District) Zones.

§ 270-17

Permitted uses.

The following principal uses are permitted as of right in the A District:

A.

Single-family dwellings.

B.

Churches or similar places of worship, parish houses, convents and community houses.

C.

Customary agricultural operations, including all buildings, structures and uses appurtenant to and used in general farming, agricultural truck farming, gardening, poultry raising, tree nurseries and greenhouses, subject to the following restrictions:

(1)

No building in which farm animals are kept shall be closer than 150 feet to any adjoining residential building.

(2)

No storage of manure or odor or dust-producing substances shall be permitted within 150 feet from any adjoining residential building.

(3)

No greenhouse heating plant shall be operated within 50 feet of any adjoining residential building.

D.

Public and private schools.

E.

Firehouses and Town maintenance and service facilities.

F.

Public parks, playgrounds and other municipal recreational uses.
G.
Public libraries and museums.
H.
Wind energy facilities subject to the requirements of the Town of Rotterdam Wind Energy Facility Law.
*Editor's Note: See Ch. **269**, Wind Energy Facilities.* **[Added 10-8-2008 by L.L. No. 10-2008]**

§ 270-18

Special uses.

[Amended 11-24-1999 by L.L. No. 17-1999]
The following special uses may be permitted or denied subject to special use review under Article **XIX** of this chapter:
A.
Golf courses and golf driving ranges.
B.
Ski lifts, ski slopes and trails and accessory facilities.
C.
Horseback riding clubs and public and private stables.
D.
Cemeteries.
E.
Mobile homes. (See Rotterdam Trailer Ordinance.
*Editor's Note: See Ch. **260**, Trailers.*)

F.
Commercial extraction of topsoil, sand, gravel or stone.
G.
Towers.
H.
Temporary accessory home-care units per Article **IV**, § **270-15.2**.
I.
Bed-and-breakfasts.
J.
Kennels, however, must comply with the following:
[Added 7-11-2001 by L.L. No. 6-2001]

(1)
Kennel pens and exercise area(s) may not be operated within 300 feet of a residence other than the residence of the owner or operator thereof.
(2)
Kennel pens may not be located within 100 feet of an adjoining property line.
(3)
The minimum lot size required is 10 acres.
(4)
Dogs must be confined within a building between the hours of 10:00 p.m. and 7:00 a.m.
(5)
Conditions to be considered when hearing a request to allow a kennel special use permit shall include, but are not limited to, the following:
(a)
Provisions for controlling offensive noise and odor.
(b)
Approved disposal plan for animal waste.
(c)
Training and/or expertise of the owner/operator.
(d)
Maximum numbers of animals to be maintained.
(e)
The effect on the character of the neighborhood.
(f)
Existing or proposed natural or man-made buffers.
K.
Private recreational uses.
[Added 6-12-2002 by L.L. No. 11-2002]

L.
Disturbance on a wetland or watercourse area of any class or in a wetland or watercourse buffer area as defined in this chapter.
[Added 4-27-2005 by L.L. No. 9-2005]

§ 270-19

Accessory uses.

Accessory uses permitted in the A District shall be limited to the following:
A.

Private garages with not more than three stalls for the parking or storage of private automobiles.

B.

Roadside produce stands.

C.

Buildings and structures for lawn care, property maintenance and permitted agriculture.

D.

Private swimming pools, tennis courts and other private recreational facilities for use of residents and not run for gain.

E.

Permitted home occupations.

F.

Accessory kennels.

G.

Accessory parking and loading.

H.

Fallout shelters.

I.

Dish antennas and accessory towers.

J.

Small wind energy facilities and wind measurement towers subject to the requirements of the Town of Rotterdam Wind Energy Facility Law.

*Editor's Note: See Ch. **269**, Wind Energy Facilities.* **[Added 10-8-2008 by L.L. No. 10-2008]**

§ 270-20

Maximum building height.

The maximum building height shall be three stories, not exceeding 40 feet, for every residential use.

§ 270-21

Yard and property line requirements.

[Amended 11-24-1999 by L.L. No. 17-1999]

A.

Front yard depth shall be 25 feet.

B.

Side yard width shall be 15 feet.

C.
Rear yard depth shall be not less than 25 feet.
(1)
For buildings exceeding three stories in height, 1/2 of the additional height shall be added to the minimum depth of 25 feet, except that a private garage may be built five feet from the rear and side property lines.
D.
Front property line: a minimum of 150 feet.

§ 270-22

Lot area.

The minimum lot area required for each principal use is one acre.

§ 270-23

Lot coverage.

Lot coverage shall not exceed 30%.

§ 270-24

Parking.

[Amended 11-24-1999 by L.L. No. 17-1999]
Off-street parking requirements applicable in the A District are set forth in § **270-149** of this chapter.

§ 270-25

Additional regulations.

For additional regulations relative to special uses, see Article **XIX**

XIX.

B-1 Retail Business District (§ 270-54 — § 270-62)

B-1 Retail Business

§ 270-54

Regulations to apply.

The following regulations shall apply to all B-1 Districts.

§ 270-55

Permitted uses.

The following uses are permitted as of right in the B-1 District:

A.

All uses permitted as of right in the R-1 and R-2 Districts, subject to the regulations specified in such residential districts.

B.

Personal service shops, including but not limited to barbershops, shoeshine shops, beauty parlors, dry-cleaning and laundry-pickup and -delivery shops and card shops.

C.

Banks, offices, restaurants, cafes, tearooms, grocery and meat stores, flower shops and similar retail establishments, except businesses primarily engaged in the sale of used goods, merchandise or machinery.

D.

Banking, confectionary, dressmaking, laundromats, printing, tailoring and upholstering, subject to the following provisions:

(1)

All such processing or manufacturing shall be done on the premises.

(2)

Not more than five persons shall be employed at any one time.

E.

Indoor theaters, assembly halls, game rooms, billiard and pool parlors and bowling alleys.

F.

Funeral homes.

G.

Operations involving the repair, reconstruction, analysis or inspection of computers, electronic and communication equipment and similar components, provided that no manufacturing is performed and all operations are conducted within a completely enclosed building.

H.

Automobile parking lots with at least 10 parking spaces for private vehicles and a driveway for entrance and exit from such spaces. Such vehicles must be in running condition, able to be driven at any time under their own power. Lots for the sale or lease of motor vehicles are specifically prohibited.

I.

Antique sales and secondhand stores, provided that such establishments shall conduct all activities and storage entirely within an enclosed building.
[Added 2-26-1997 by L.L. No. 2-1997]

§ 270-56

Special uses.

The following special uses may be permitted or denied subject to review under Article **XIX** of this chapter:
A.
Drive-in establishment accessory to a permitted use.
B.
Public utility or communications installations.
C.
Convenience store.
D.
Car wash.
E.
Fence companies, retail and wholesale.
[Added 9-8-1999 by L.L. No. 13-1999]

F.
Disturbance on a wetland or watercourse area of any class or in a wetland or watercourse buffer area as defined in this chapter.
[Added 4-27-2005 by L.L. No. 9-2005]

§ 270-57

Accessory uses.

Accessory uses permitted in the B-1 District shall be limited to the following:
A.
Parking and loading.
B.
Bus shelters and loading areas.
C.
Permitted signs.
D.
Storage and building accessory to the principal use.
E.

Accessory uses permitted in the R-1 and R-2 Districts.

F.

Small wind energy facilities and wind measurement towers subject to the requirements of the Town of Rotterdam Wind Energy Facility Law.

*Editor's Note: See Ch. **269**, Wind Energy Facilities.* **[Added 10-8-2008 by L.L. No. 10-2008]**

§ 270-58

Maximum building height.

The maximum building height shall be three stories, not exceeding 40 feet, for residential uses, and four stories, not exceeding 50 feet, for nonresidential uses.

§ 270-59

Lot area.

[Amended 12-26-1990 by L.L. No. 26-1990]

The minimum lot area required for each principal use is 15,000 square feet, with a minimum lot width of 100 feet.

§ 270-60

Lot coverage.

Lot coverage shall not exceed 45% for residential uses and not exceed 60% for principal and accessory nonresidential buildings.

§ 270-61

Yard requirements.

A.

Any building used for purposes permitted in an R-1 District shall have front, side and rear yards as required in an R-1 District; and any building used for purposes permitted in an R-2 District shall have front, side and rear yards as required in an R-2 District.

B.

Yard requirements for all other buildings and structures shall be:

(1)

Front yard depth: a minimum front yard of 30 feet is required, which area may be used for off-street parking in connection with the principal use of the lot.

(2)

Side yard width: not less than 10 feet. In situations where two or more buildings, with the same zoning classification, are contiguous and share a common wall along an interior lot line, the minimum required side setback may be reduced to zero feet by the Planning Commission during the site plan review process.
[Amended 6-9-1999 by L.L. No. 9-1999]

(3)
Rear yard depth: not less than 25 feet.

§ 270-62

Parking.

Off-street parking requirements applicable in the B-1 District are set forth in § **270-149** of this chapter.

R-3 Multiple-Family District (§ 270-45 — § 270-53)

R-3 Multi Family District

§ 270-45

Regulations to apply.

The following regulations shall apply to all R-3 Districts.

§ 270-46

Permitted uses.

The following principal uses are permitted as of right in the R-3 District:
A.
Multiple-family dwellings.
B.
Two-family dwellings.
C.
Churches or similar places of worship, parish houses, convents and community houses.
D.
Public and private schools.
E.
Firehouses.
F.

Public parks, playgrounds and other municipal recreational uses.

G.

Public libraries and museums.

H.

Child and infant day-care centers.

§ 270-46.1

(Reserved)

§ 270-46.2

(Reserved)

§ 270-46.3

(Reserved)

§ 270-46.4

(Reserved)

§ 270-46.5

Special uses.

[Added 4-27-2005 by L.L. No. 9-2005]

The following special uses may be permitted or denied subject to special use review under Article **XIX** of this chapter:

A.

Disturbance on a wetland or watercourse area of any class or in a wetland or watercourse buffer area as defined in this chapter.

§ 270-47

Accessory uses.

Accessory uses in the R-3 District shall be limited to the following:

A.

Garages containing not more than one parking space for each dwelling unit.

B.
Private swimming pools, tennis courts and other private health or recreational facilities for the use of residents and not serving the general public.
C.
Permitted home occupations.
D.
Accessory parking and loading.
E.
Buildings for lawn care and property maintenance.
F.
Fallout shelters.
G.
Dish antennas and permitted accessory towers.
H.
Small wind energy facilities and wind measurement towers subject to the requirements of the Town of Rotterdam Wind Energy Facility Law.
*Editor's Note: See Ch. **269**, Wind Energy Facilities.* **[Added 10-8-2008 by L.L. No. 10-2008]**

§ 270-48

Maximum building height.

¥ **Close**
¥ **Print**
¥ **Basic View**

The maximum building height shall be three stories, not exceeding 40 feet.

§ 270-49

Lot area.

[Amended 12-26-1990 by L.L. No. 26-1990]
The minimum total lot area shall be 20,000 square feet, except that buildings or structures with more than four bedrooms shall increase the total lot area by a minimum of 3,000 square feet for each additional bedroom over four, with a minimum lot width of 100 feet.

§ 270-50

Lot coverage.

Lot coverage shall not exceed 45%.

§ 270-51

Yard requirements.

A.
Front yard depth shall be 30 feet.
B.
Side yard width shall be not less than 20 feet.
C.
Rear yard depth shall be not less than 25 feet, except that a private garage may be built five feet from the rear and side property line.
D.
Increased yard depth. In reviewing every multiple-family project development plan, the Planning Board shall consider the yards and proposed screening of parking, common open space and buildings and may require provision of a yard depth up to twice the applicable yard requirements listed above, where such greater yard depth is necessary to preserve neighborhood character and property values.

§ 270-52

Design requirements.

A.
Access. Every multiple-family development shall have safe and direct access to a major street or arterial.
B.
Utilities. No multiple-family development proposal shall be considered unless adequate public water supply and sufficient sewage disposal facilities are available. No certificate of occupancy shall be issued until all dwelling units are connected to approved and functioning common water and sewage disposal facilities.
C.
Common open space. Not less than 15% of the gross acreage of the site shall be composed of land which is permanently dedicated to common open space. In reviewing the development plan, the Planning Board may require that up to 30% of the gross acreage of the site be permanently dedicated to common open space and to natural areas where such area is needed to preserve sensitive land, to maintain neighborhood character or to create needed recreational facilities.
D.

Maintenance of common open space. The multiple-family development plans shall include such provisions for the ownership and maintenance of all common open space and natural areas as are reasonably necessary to ensure their continuity, care, conservation, maintenance and operation and to ensure that remedial measures are available to the Town if such property is permitted to deteriorate or is changed in use from that permitted.

E.

Landscaping. All portions of every multiple-family development which are not used for locations of buildings, structures, parking, circulation roadways, sidewalks, preserve areas or similar purposes shall be suitably landscaped and permanently maintained with plantings of trees and shrubbery, as approved by the Planning Board as part of the site plan, so as to minimize erosion and stormwater runoff and harmoniously blend such uses with the residential character of the development and neighborhood.

F.

Buffer yards. Except where a required yard abuts a public street or roadway, every exterior yard shall be screened with evergreen landscape plantings at least six feet in height and/or with natural vegetation, trees and shrubbery in a manner which effectively screens the multiple-family use from adjoining lots or parcels.

G.

Pedestrian circulation. Sidewalks and pathways shall be designed so as to provide safe and convenient access between buildings and recreation facilities, parking, loading areas and public transportation stops.

H.

Planning Board consideration. The Planning Board reserves the right to raise any other related questions and to impose requirements or conditions as may be appropriate and proper in achieving the intent of these design standards.

§ 270-53

Parking.

Off-street parking requirements applicable in the R-3 District are set forth in § **270-149** of this chapter.

Appendix 2

Management for Avian Species in the Woodlawn Preserve
By Alan Schroeder

To date there is no evidence of breeding populations of either Endangered or Threatened avian species within the Woodlawn Preserve boundaries.

The Woodlawn Preserve consists of approximately 100 acres of varying habitats. Originally Pine Barrens type habitat the area changed over time, due in part to the influence of man, and now is made up of varying yet distinctly different habitats, i.e. riparian forest, wetlands, hardwood forests, fresh water marsh, to name a few. With respect to avian populations this is a good thing, it allows for a variety of differing species to breed within the preserve boundaries.While most species may be able to take advantage of the varying habitats naturally there are some which would benefit directly from an ongoing management plan.

Two species in particular, which would benefit, would be the Eastern Bluebird (*Sialia sialis*), the New York State bird, and the Tree Swallow (*Tachycineta bicolor)*. Both species are hole nesters, using available abandoned woodpecker holes to raise their young. Both species consume large volumes of insects and require fairly large open spaces for their territories. The Bluebird prefers an open grassy or other low vegetation type area whereas the Tree Swallow spends most of it's time hunting mosquitoes over fields or bodies of open water. The area around the lake would be ideal for placement of a number of nest boxes to attract Tree Swallows. Farther away from the water in both the southeast and southwest southern pond shore as well as the sandy area to the southeast of the lake would be suitable for Bluebird nest boxes. To support any nest boxes some of the young Black Locust trees could be cut as support posts. Nest boxes would need to be repaired as needed and cleaned annually.

The areas to either side of the blacktop road, from the entrance to the lake, between the marsh and the railroad tracks, has a number of Black Locust trees which should also be removed to allow the understory growth, made up of various shrubs, to fill out thus creating more food and shelter not only for breeding species but migrating species as well.

The wooded areas to the northwest of the drainage canal, surrounding the vernal pond and the wooded upper dunes are predominantly older hardwood forests. These areas should remain intact. They support a large variety of bird life both during the breeding season and during migration. Breeding species would include wild turkey, thrushes, four species of woodpeckers, including Pileated Woodpecker, Ruffed Grouse, hawks, warblers, tanagers and vireos.

A project to build a wild lupine colony and reintroduce the endangered Karner Blue Butterfly in the large sandy area to the southeast of the lake, could also prove beneficial to some ground nesting species i.e. Prairie Warbler, Field Sparrow and Eastern Towhee.

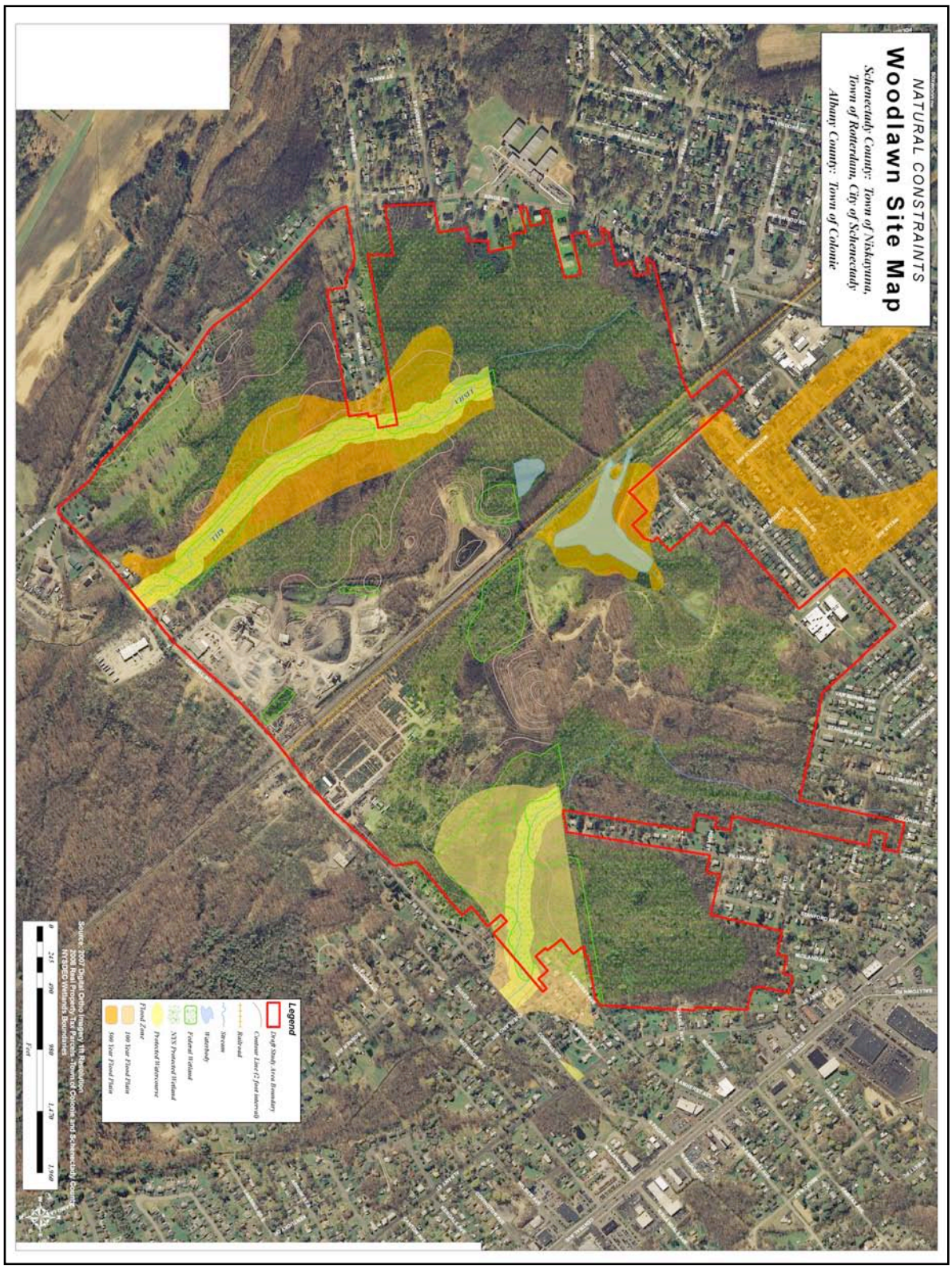


Figure 67. Natural Constraints and protected waterbodies. Source: SCPD.

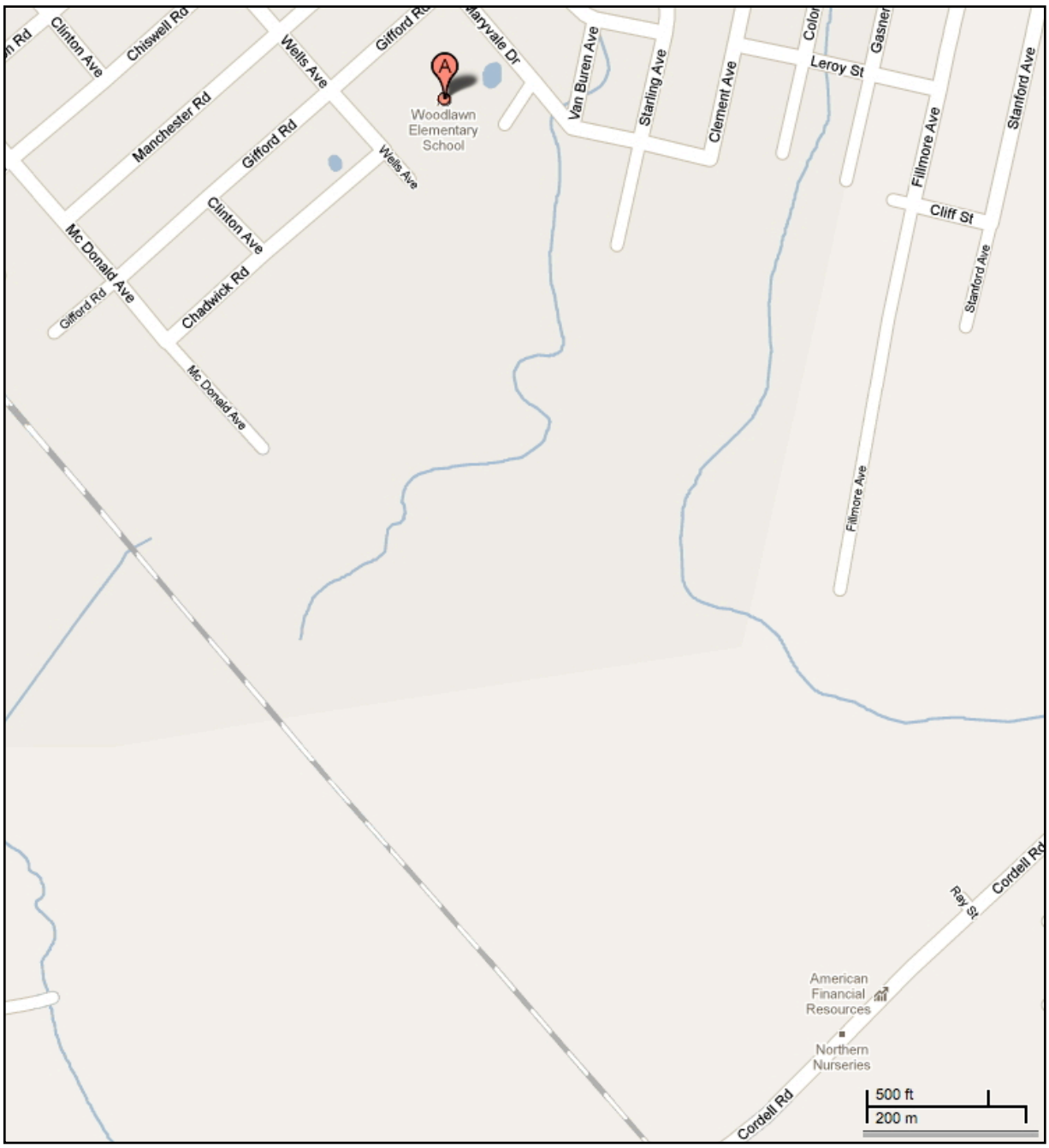


Figure 68. Map showing Lisha Kill tributaries located in preserve area.

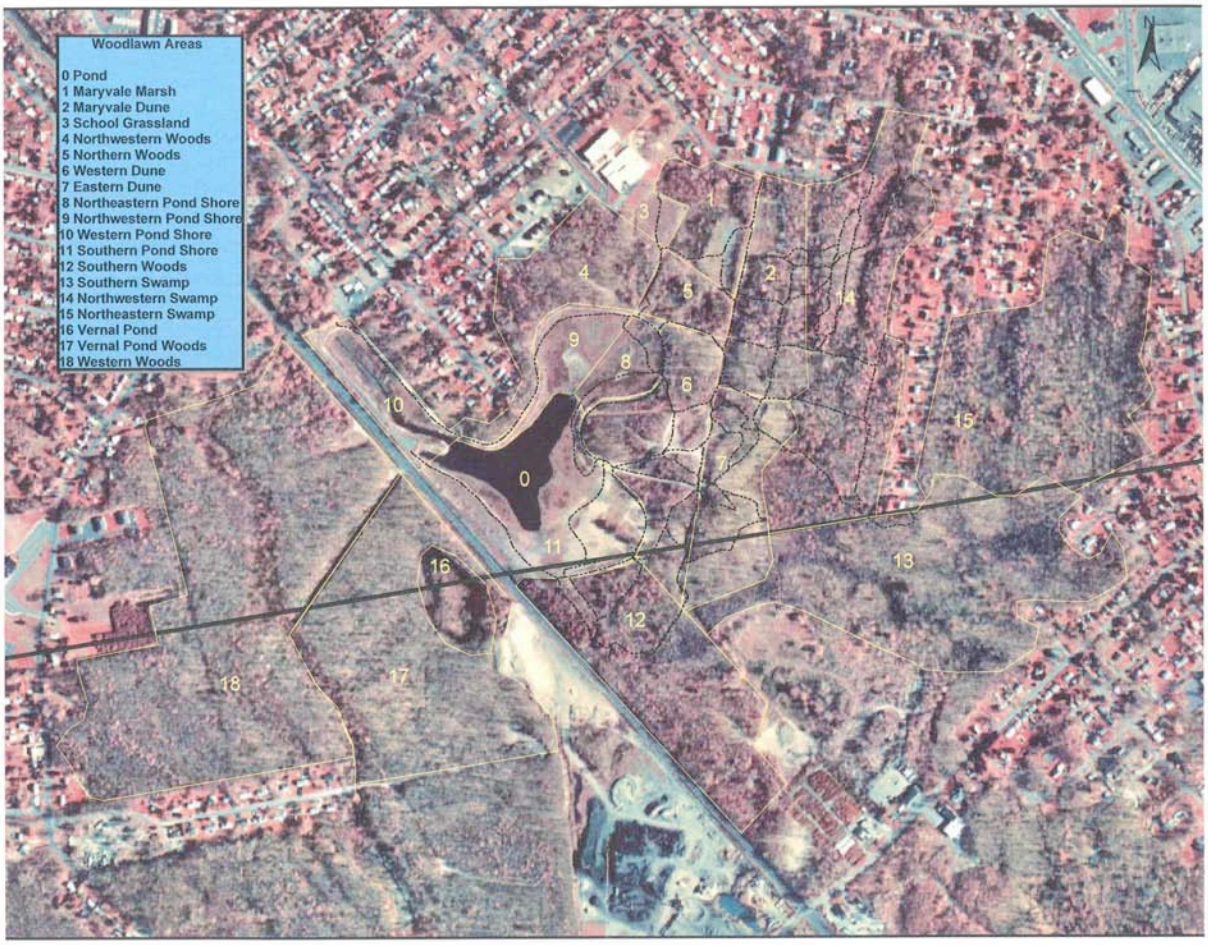


Figure 69. Woodlawn Preserve area broken down by eco-communities. Source: SCEM

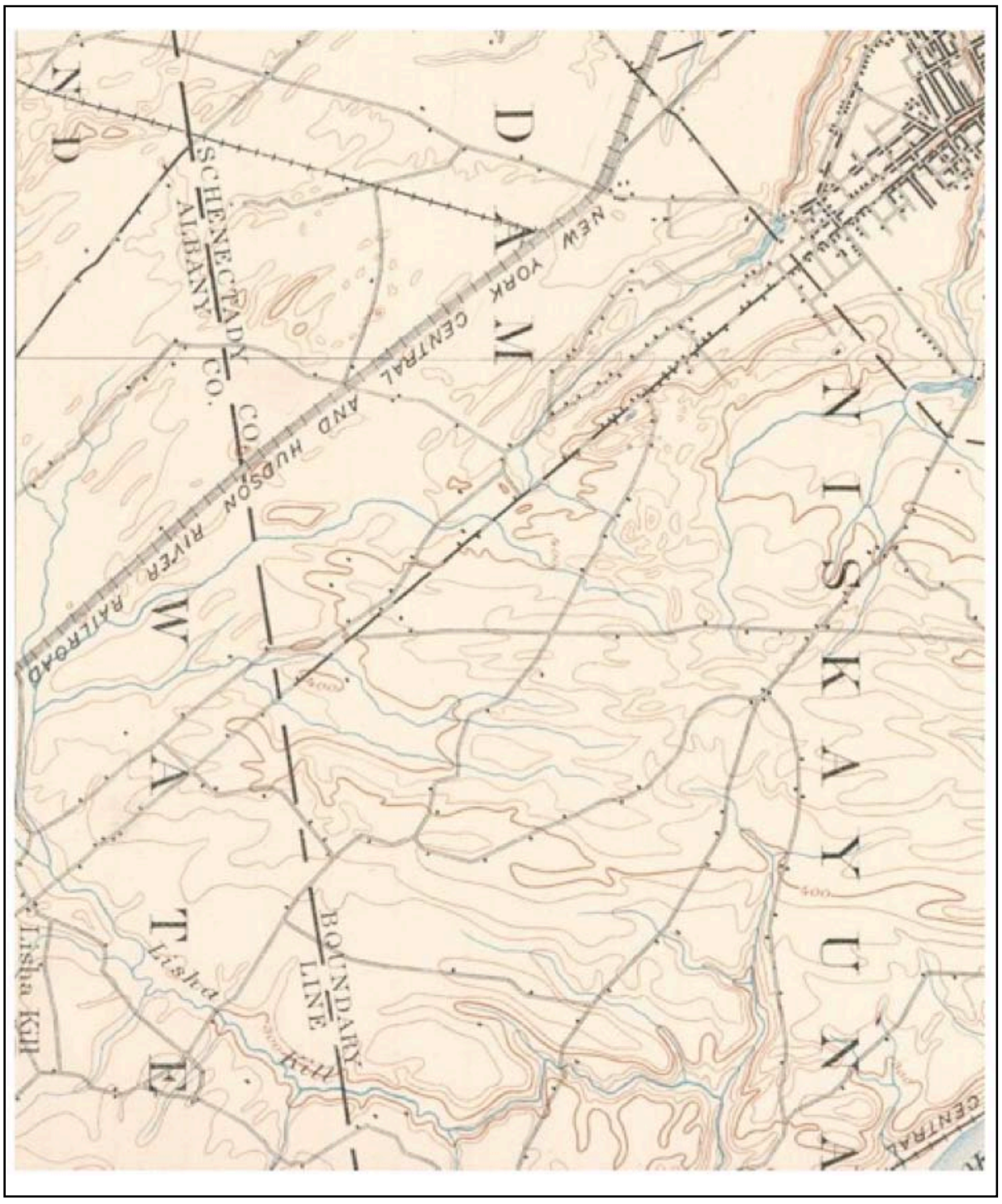


Figure 70. USGS Topo map of 1898 showing Woodlawn area.

Figure 71. USGS Topo map of 1930 showing Woodlawn Area.

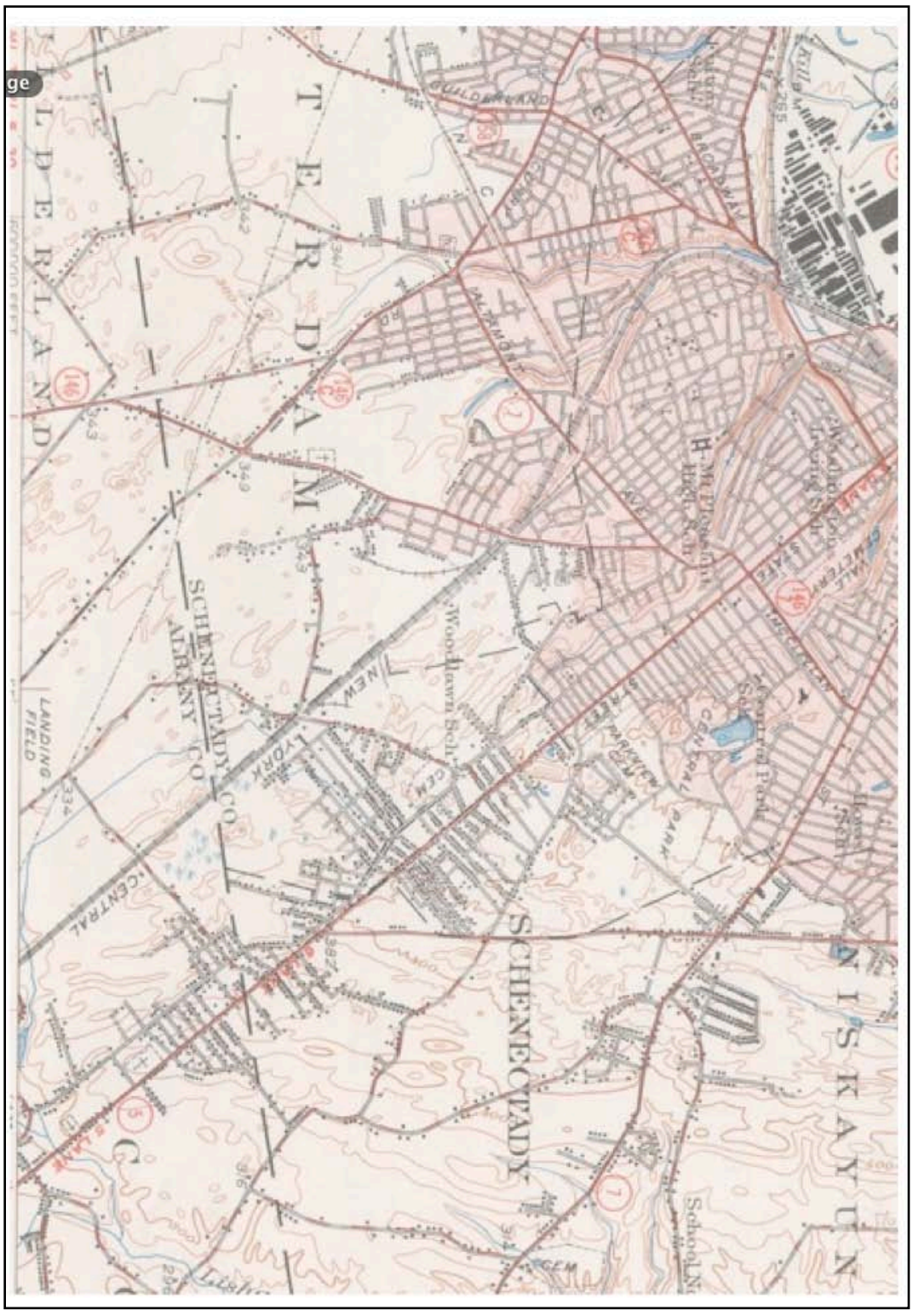


Figure 72. USGS Topo map of 1949 showing Woodlawn Area.

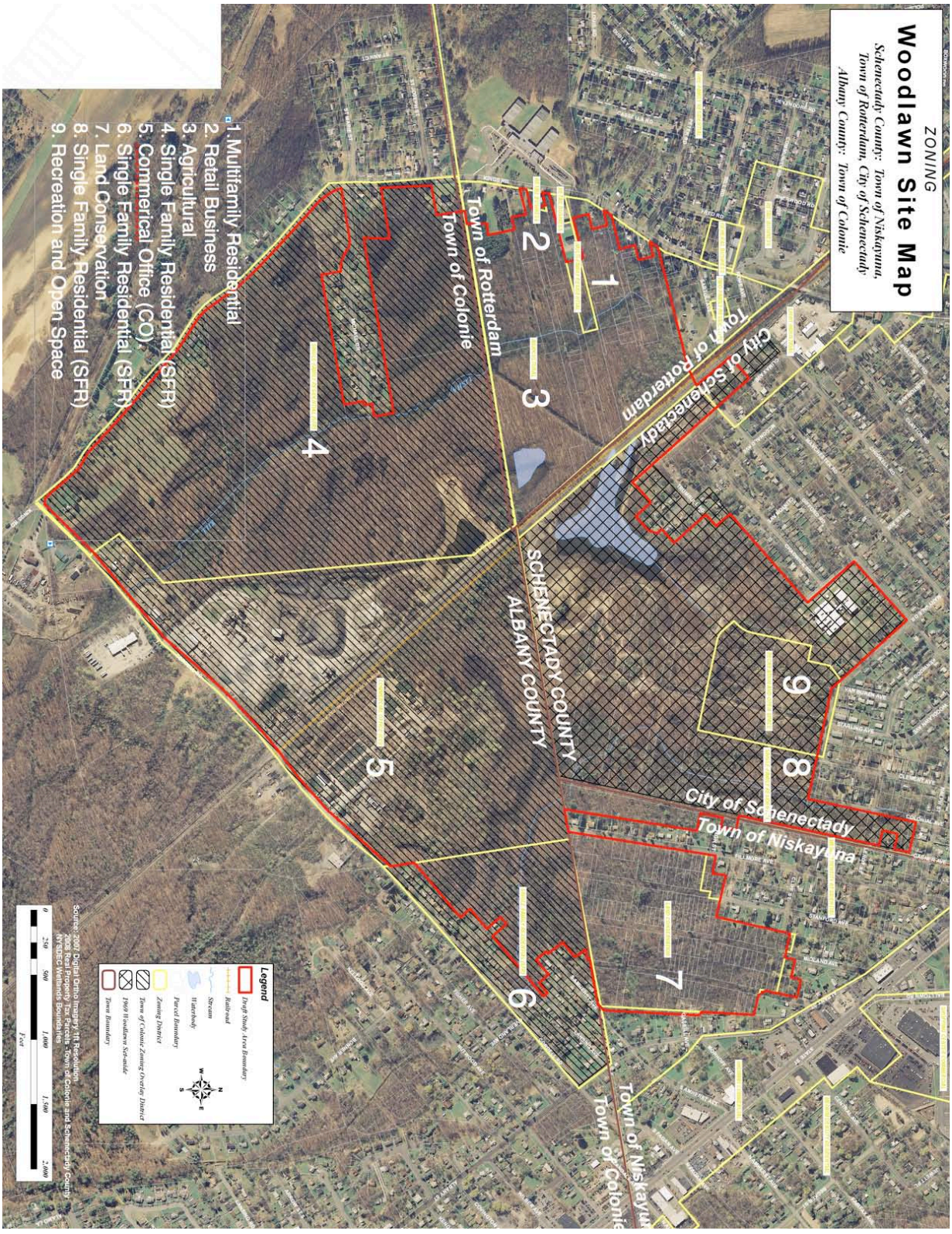


Figure 73. Current Zoning ratings in Western Pine Bush area. Modified map from SCPD.

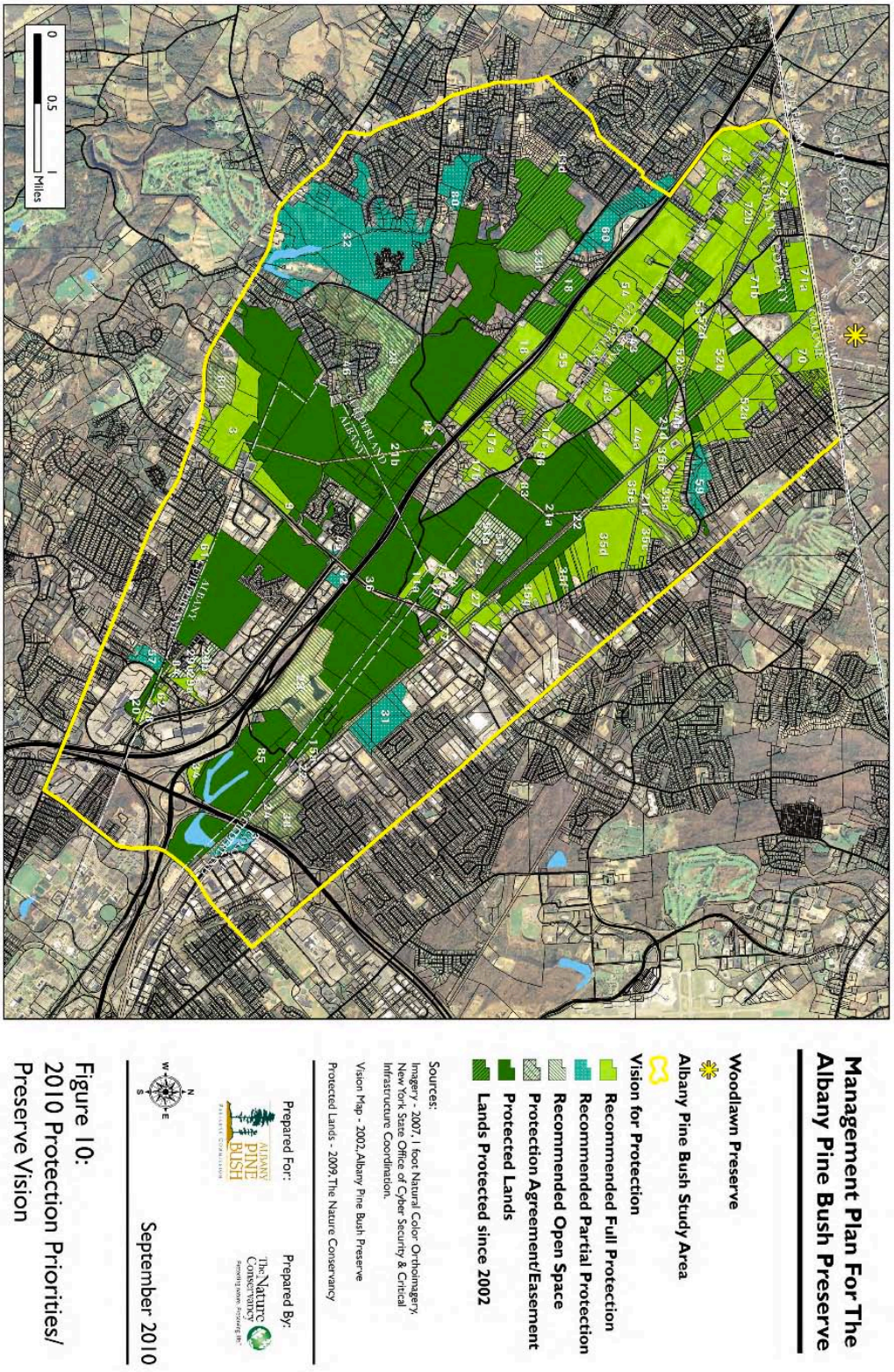


Figure 10:
2010 Protection Priorities/
Preserve Vision

Figure 74. Albany Pine Bush Commission 2010 Protection Priorities and Woodlawn proximity. Source Albany Pine Bush Commission Management Plan.

Appendix 3

The Geological Prehistory of Schenectady
By Don Rittner

On June 16, 1643, the future founder of Schenectady, Arendt Van Curler, wrote to his uncle Killian Van Rensselaer, that, "Within a half-a-day's journey from the Colonie, lies the most beautiful land on the Mohawk river that eye ever saw." [13] He had described what would become the city of Schenectady although it would be another 18 years before he could actually obtain title for it.

While Van Curler may have been stating the obvious - the beautiful hills, streams, and fertile lands of the Schenectady region - what he did not know was that it took millions of years of geologic processes to create the land he so admired. The land Van Curler wanted to occupy had actually originated thousands of miles away and was the product of plate tectonics, volcanism, mountain building, erosional forces of water, and glacial activity. Like a painter and his tools, the forces of nature took a natural canvas and created a work of art that humanity could admire and exploit.

Continents Adrift

New York State and in particular Schenectady's geologic history begin more than 1.3 billion years ago when large amounts of sediment was deposited in shallow seas. After these sediments were deformed and metamorphosed, a result of a continent-to-continent collision - called an orogeny - that took place 1.1 to 1.0 billion years ago, high mountain ranges and a plateau were created and then eroded down to flatlands over the next 400 million years. At this time all of the earth's continents were fused together into one supercontinent.

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[13] Van Curler's Letter to the Patroon. Rensselaerwyck Manuscripts. 297-312. Translated and published in *Centennial Address Relating to the Early History of Schenectady and Its first settler*s. Delivered at Schenectady, July 4th, 1876 by Hon. John Sanders. Albany, N.Y. Van Benthuysen Printing House, 1879.

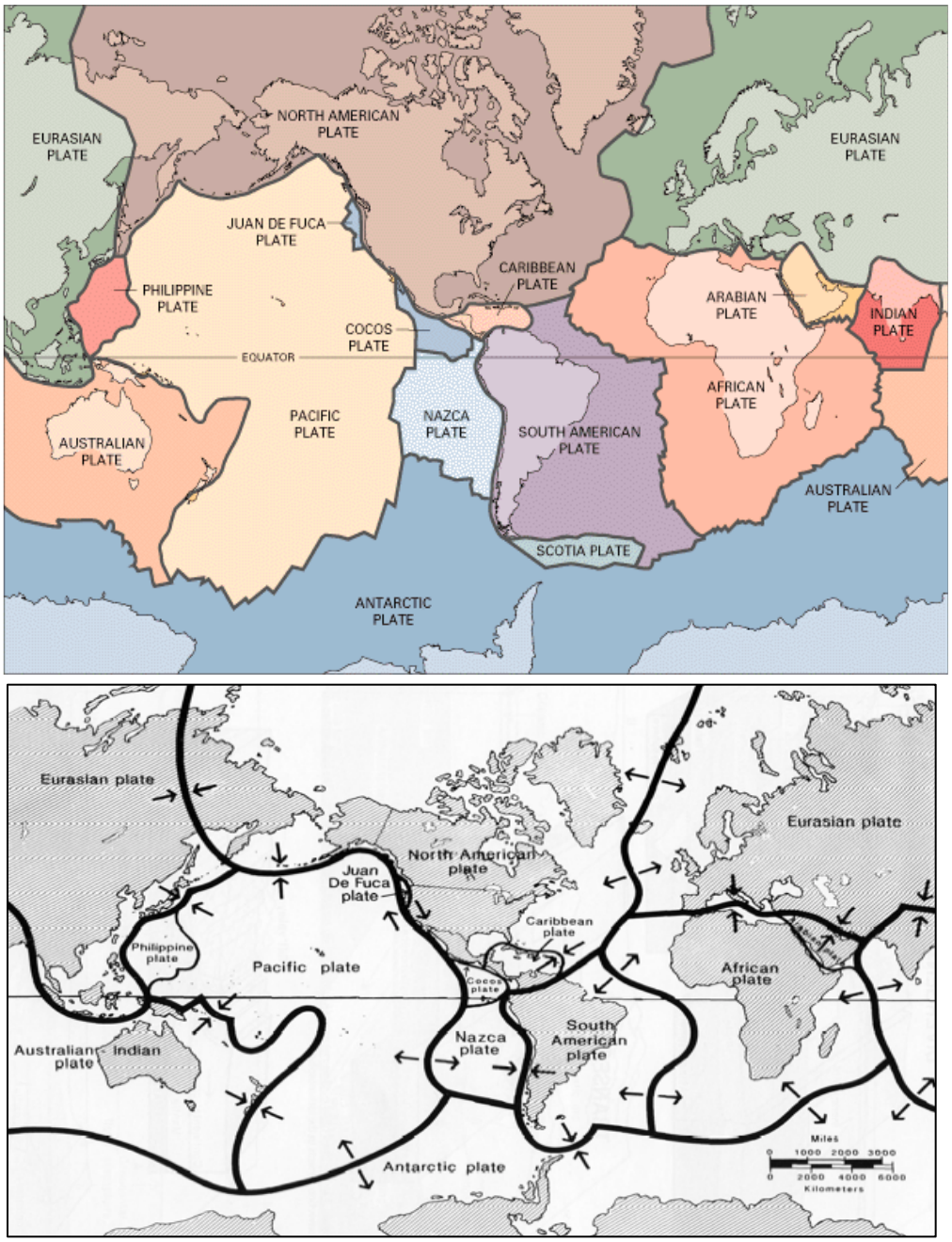


Figure 75. The Earth's crust is made up of several continental plates that are moving in opposing positions. Source, USGS; NYS Geological Survey.

Beginning about 660 million years ago this supercontinent started to split apart and slide along the east coast of Proto-North America, which at the time was located south of the equator. New oceanic crust was formed in a widening rift from 600 to 560 million years ago and enlarged and expanded into the Iapetus Ocean. In this ocean, a large volcanic arc, similar to the ones in the Caribbean and the Philippines today, formed about 550 million years ago.

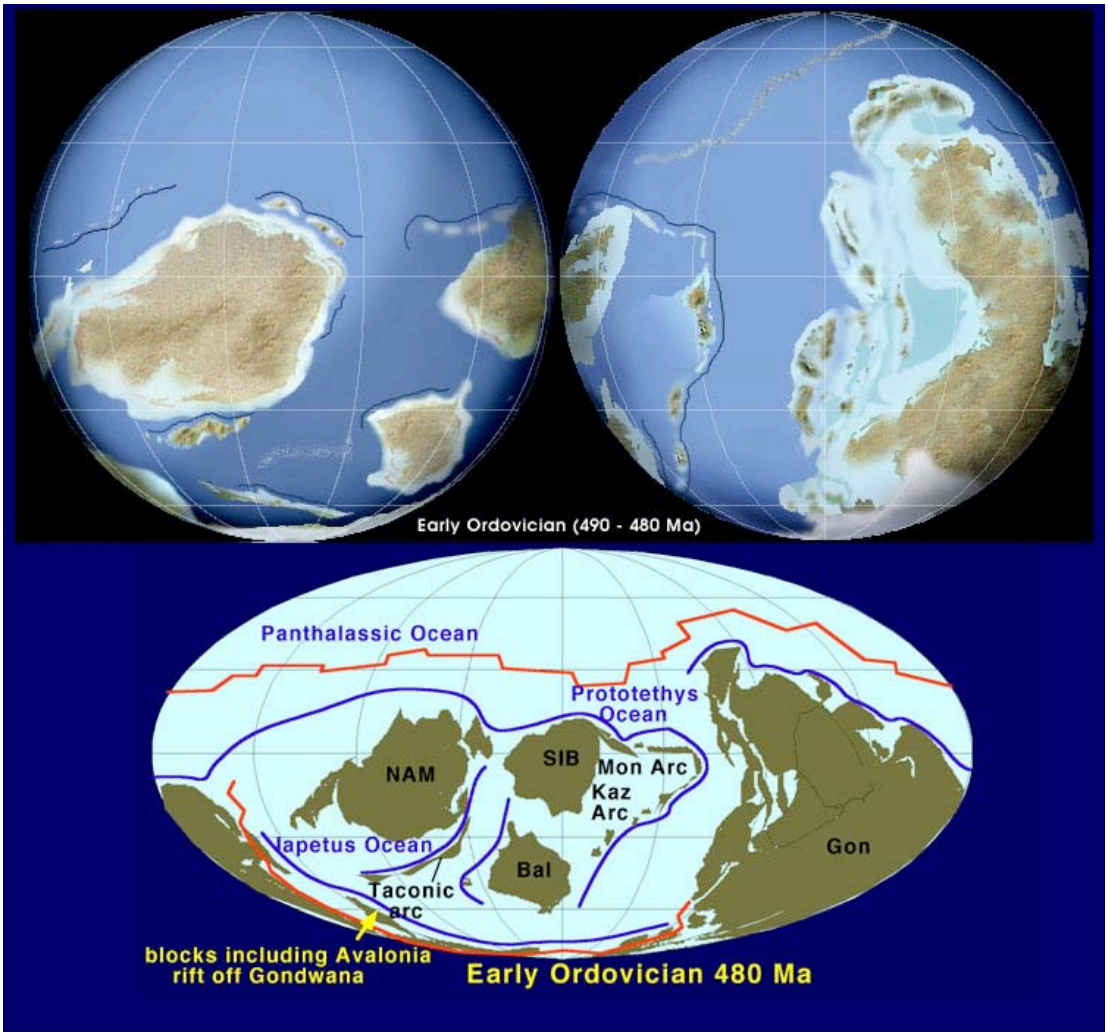


Figure 76. The bedrock that forms most of the Schenectady region was laid down during the Cambrian-Ordovician Period more than 400 million years ago (MYA). Here Proto-North America is south of the equator.

Volcanic activity continued for 100 million years until this island arc collided with the proto-North America land mass. This collision - called the Taconian Orogeny – created a mountain range that extended from Newfoundland to Alabama during the Ordovician Period. These mountains eroded and rivers flowing down their western slopes carried sediments into a shallow inland sea until the remaining part of the Iapetus Ocean closed. This collision created the Acadian Orogeny and created high mountains and a large plateau along the eastern part of the continent. While it had little effect on New York the eroded sediments from the mountains formed a large "Catskill Delta" which partially filled in the shallow sea.

From about 330 to 250 million years ago, Proto-Africa slid into and attached to Proto-North America. This collision - called the Alleghanian Orogeny - created the Appalachian Mountains from Alabama to Newfoundland. As these mountains eroded, sediments dumped into the shallow sea and forced it south and west. Orogenies such as these and other events eventually

forced the entire continental crust together again into a supercontinent called Pangea. Pangea began breaking apart around 220 million years ago forcing Africa to separate from North America and creating a rift that became the present Atlantic Ocean.

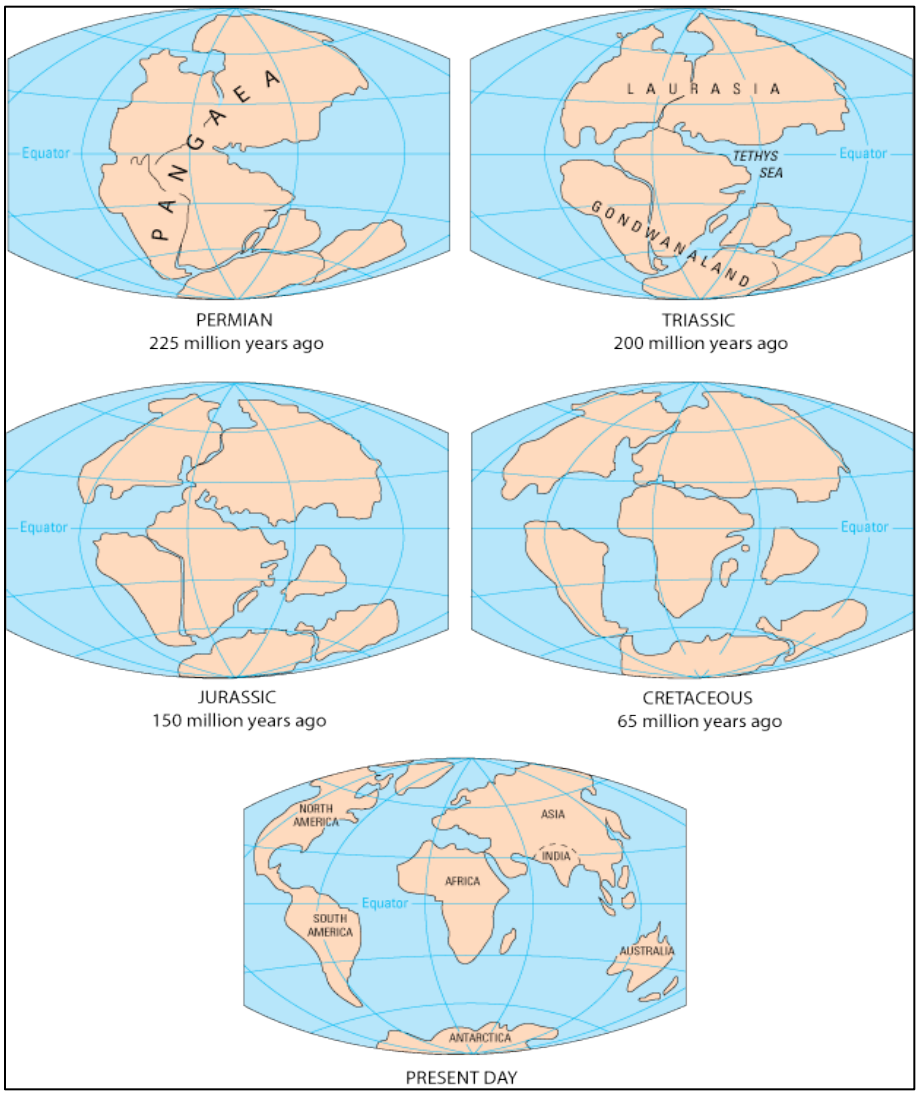


Figure 77. Plate Tectonics. USGS

Block diagram showing proto-North America and proto-Africa colliding along a transform margin. This collision, the Alleghanian Orogeny, built the Appalachian Mountains.

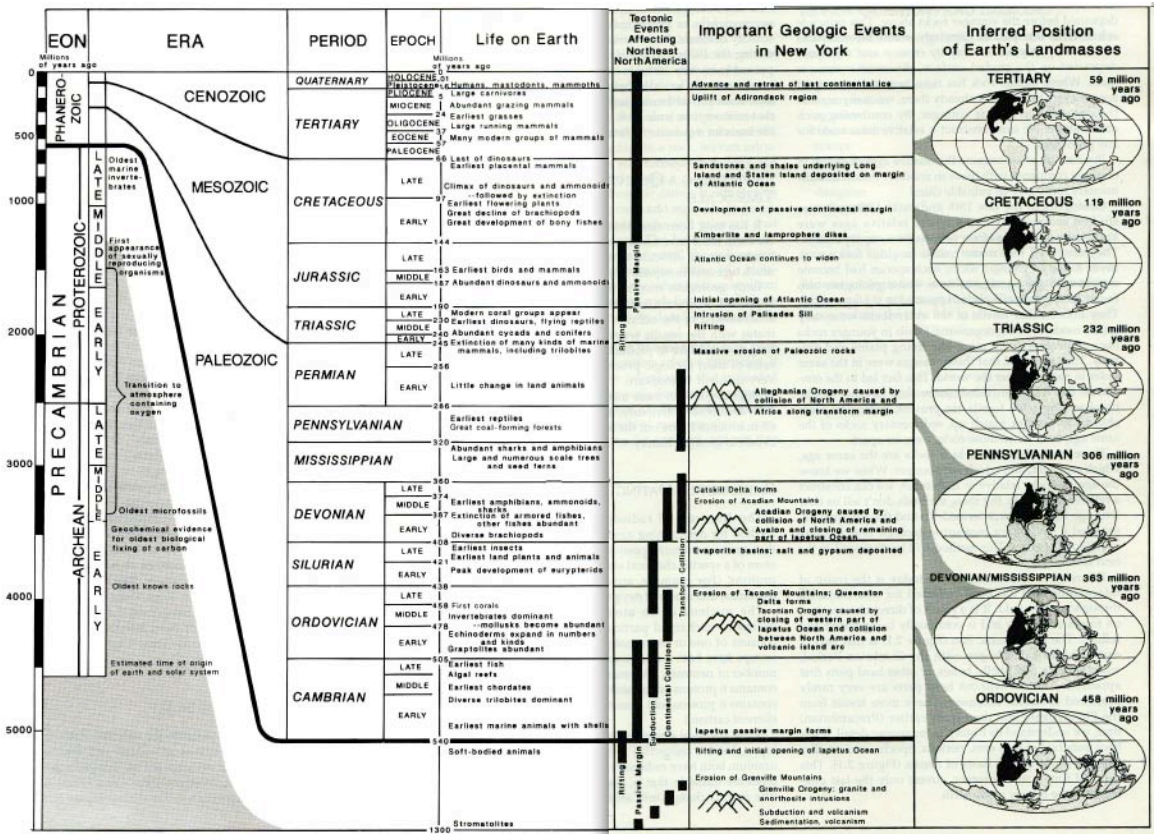
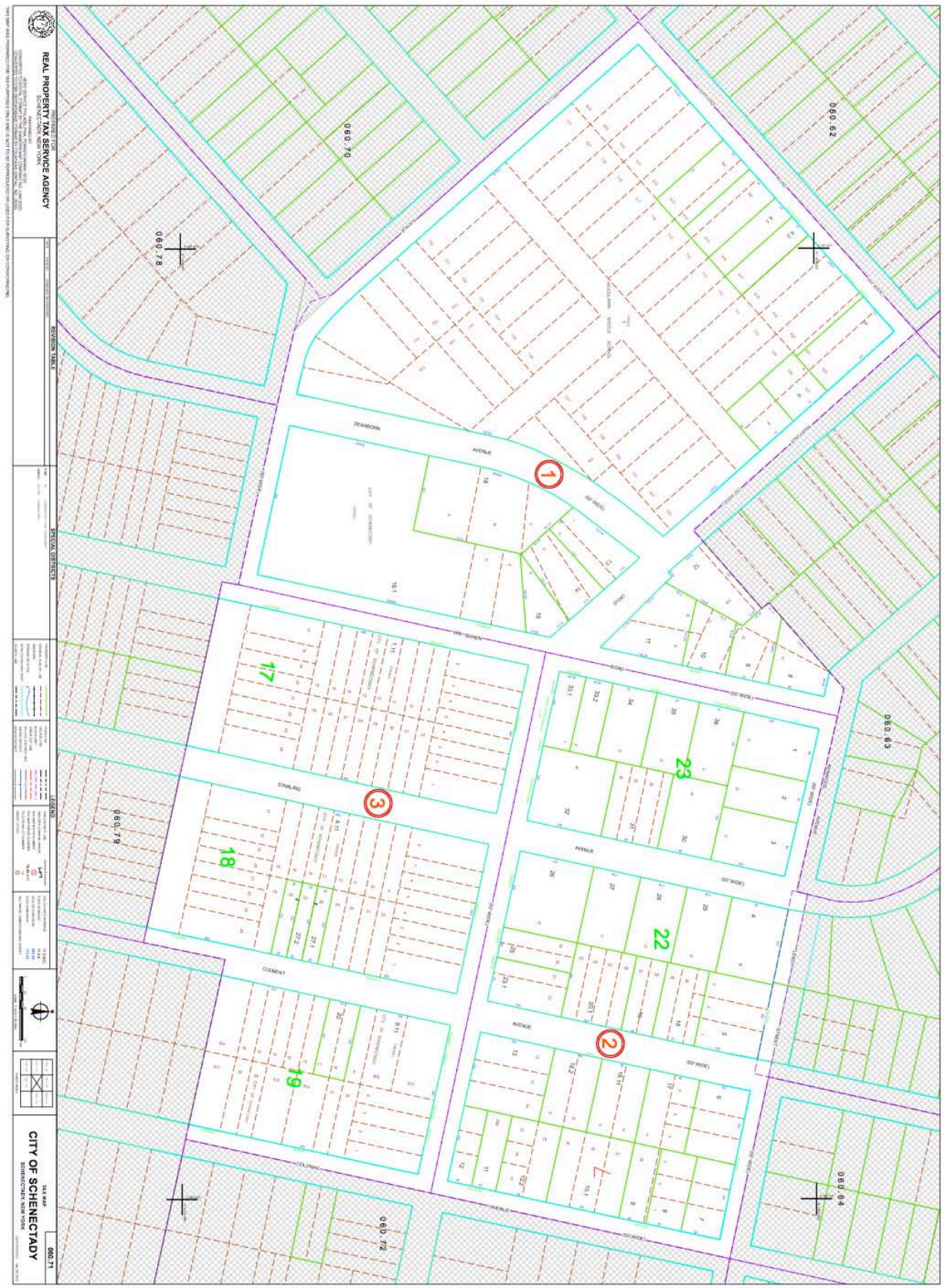


Figure 78. Geologic Time Scale

Appendix 4

Vacant Land Parcels in Woodlawn Area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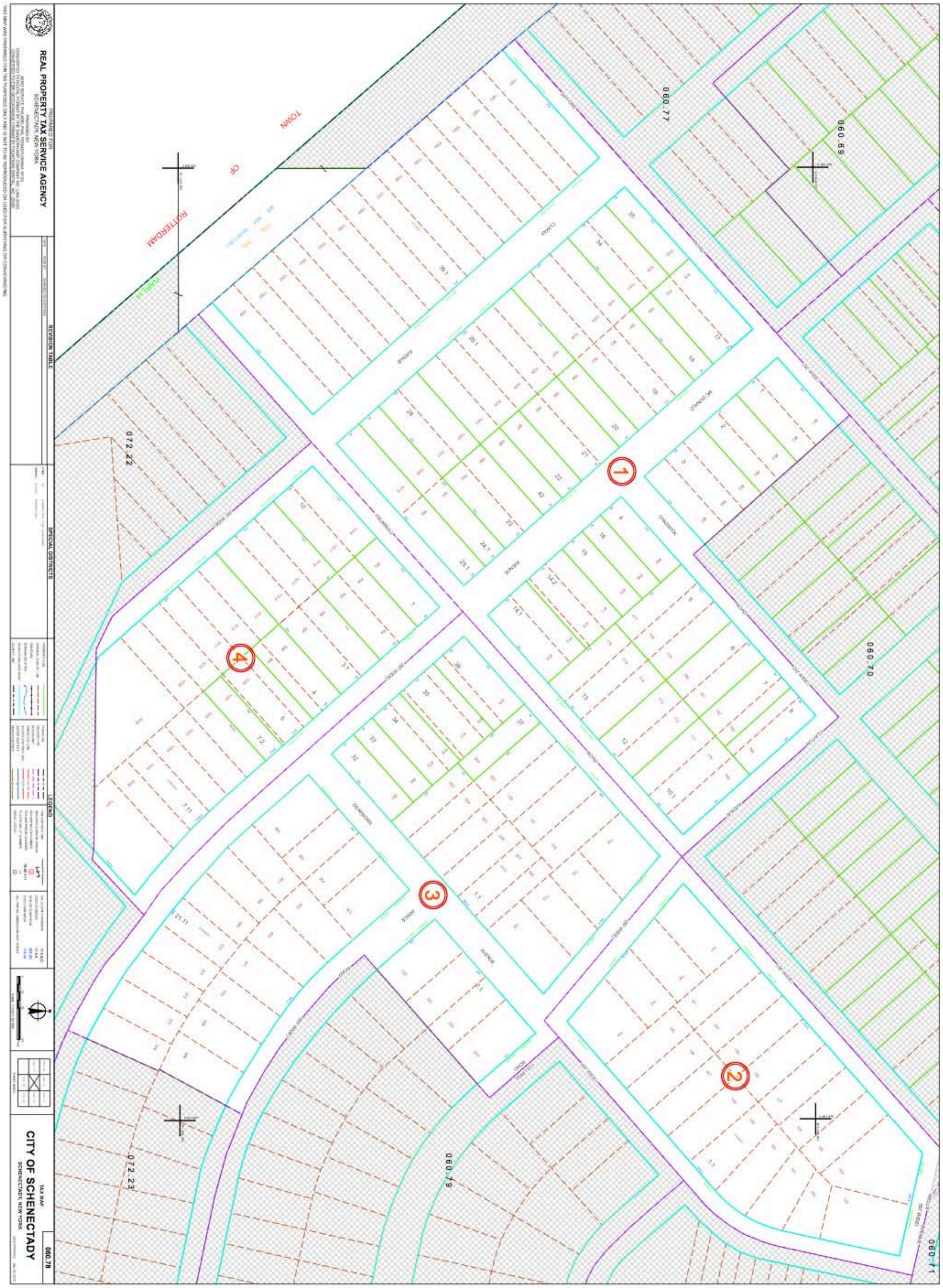
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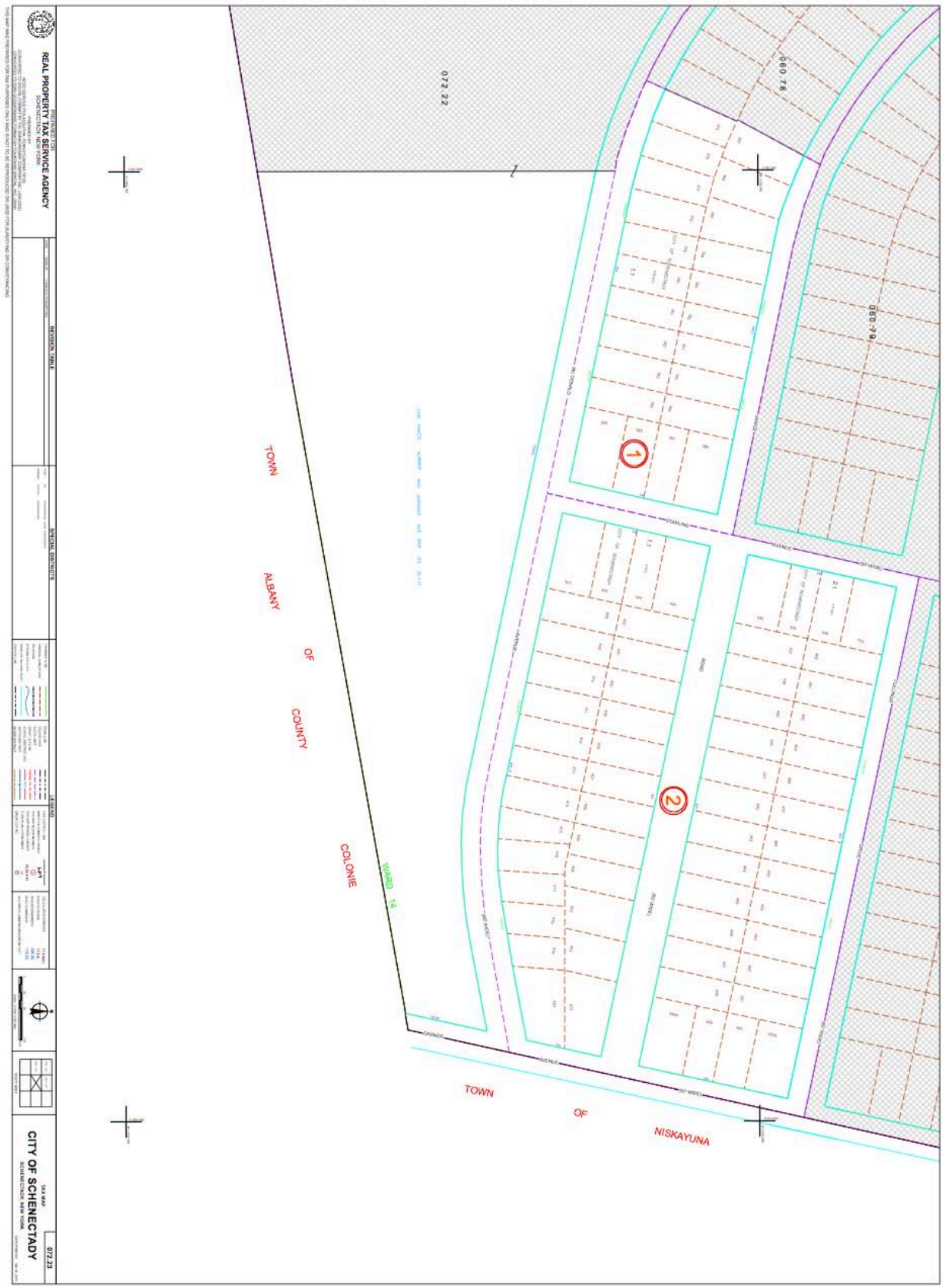
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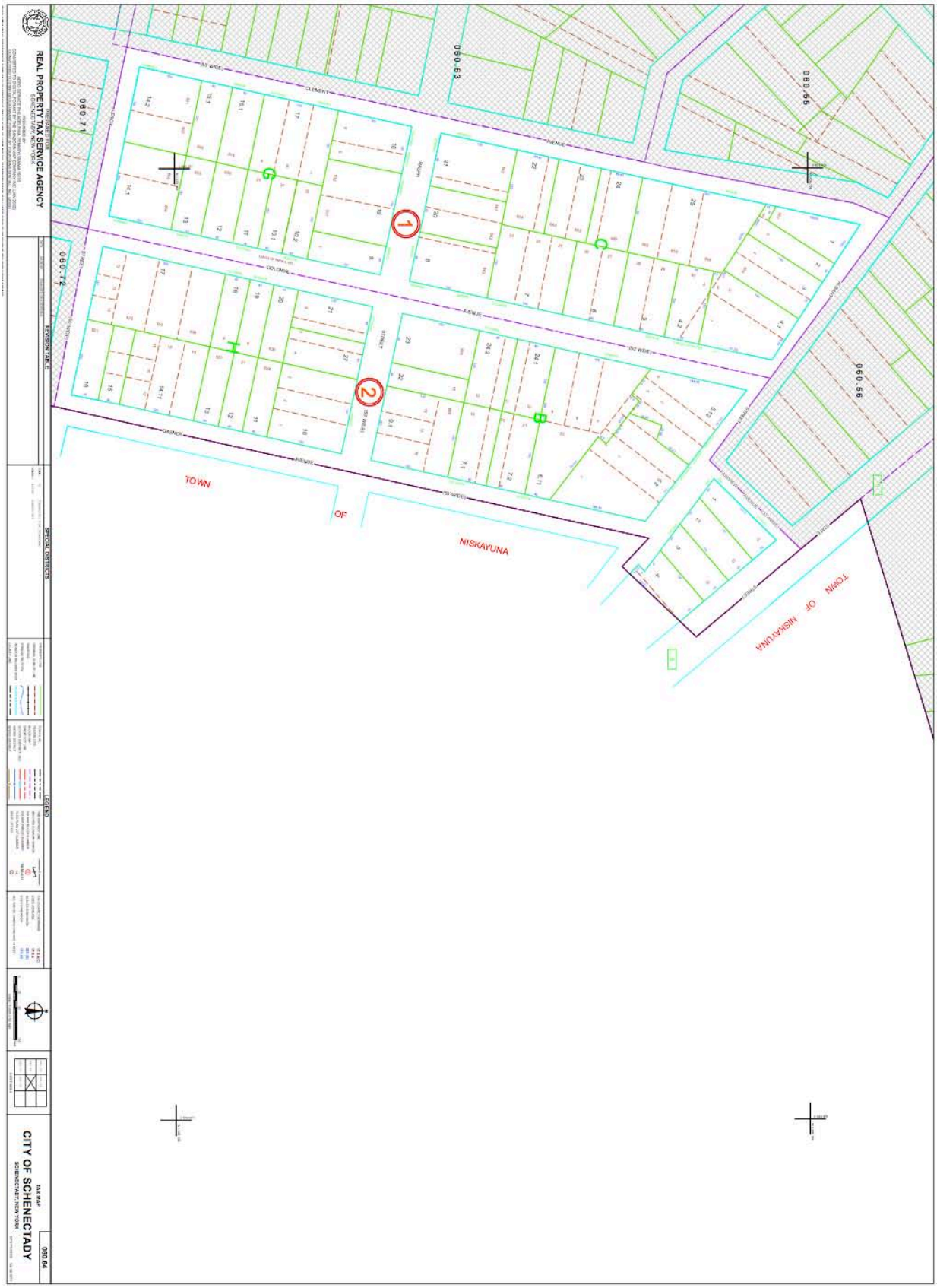
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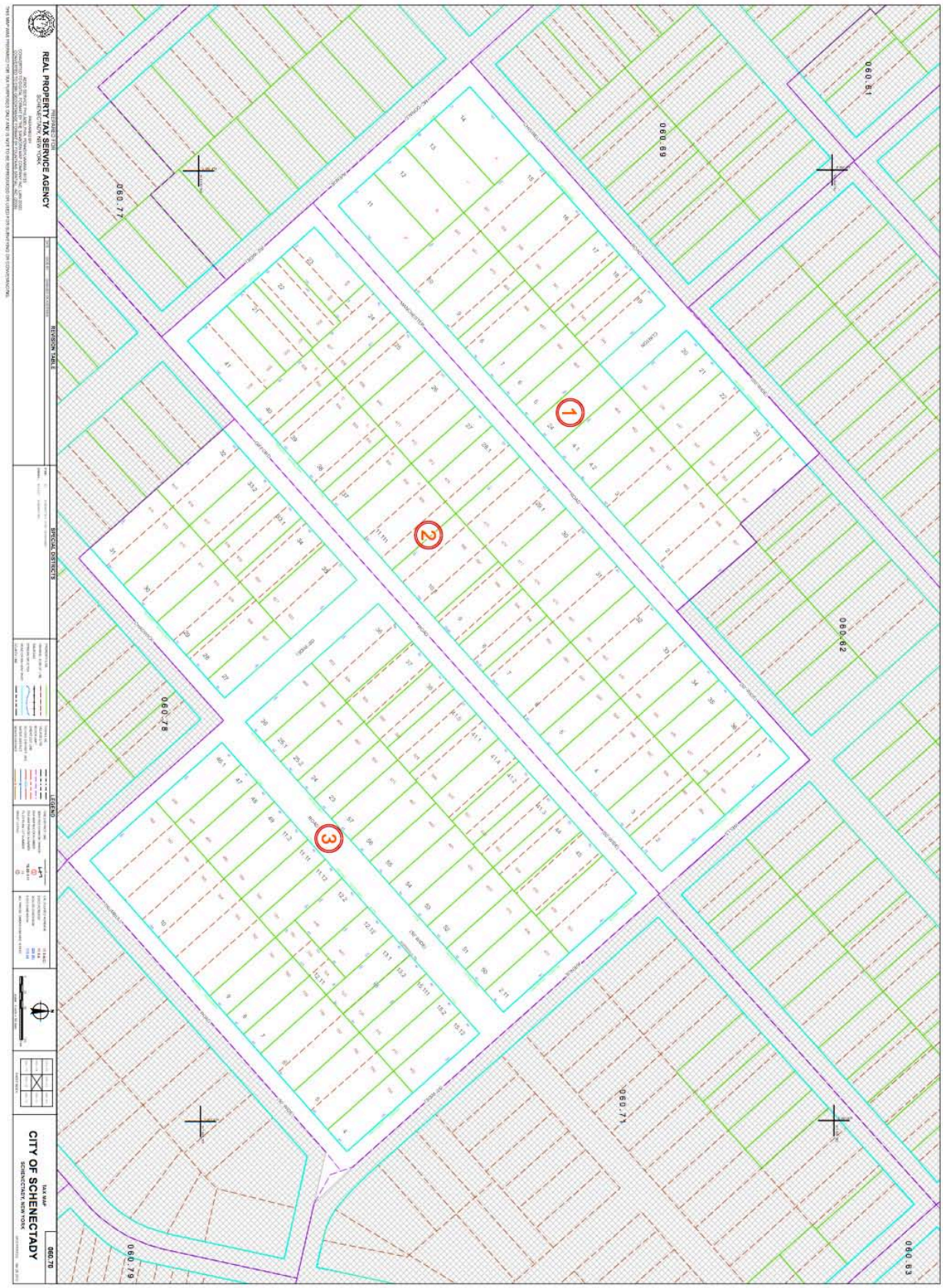
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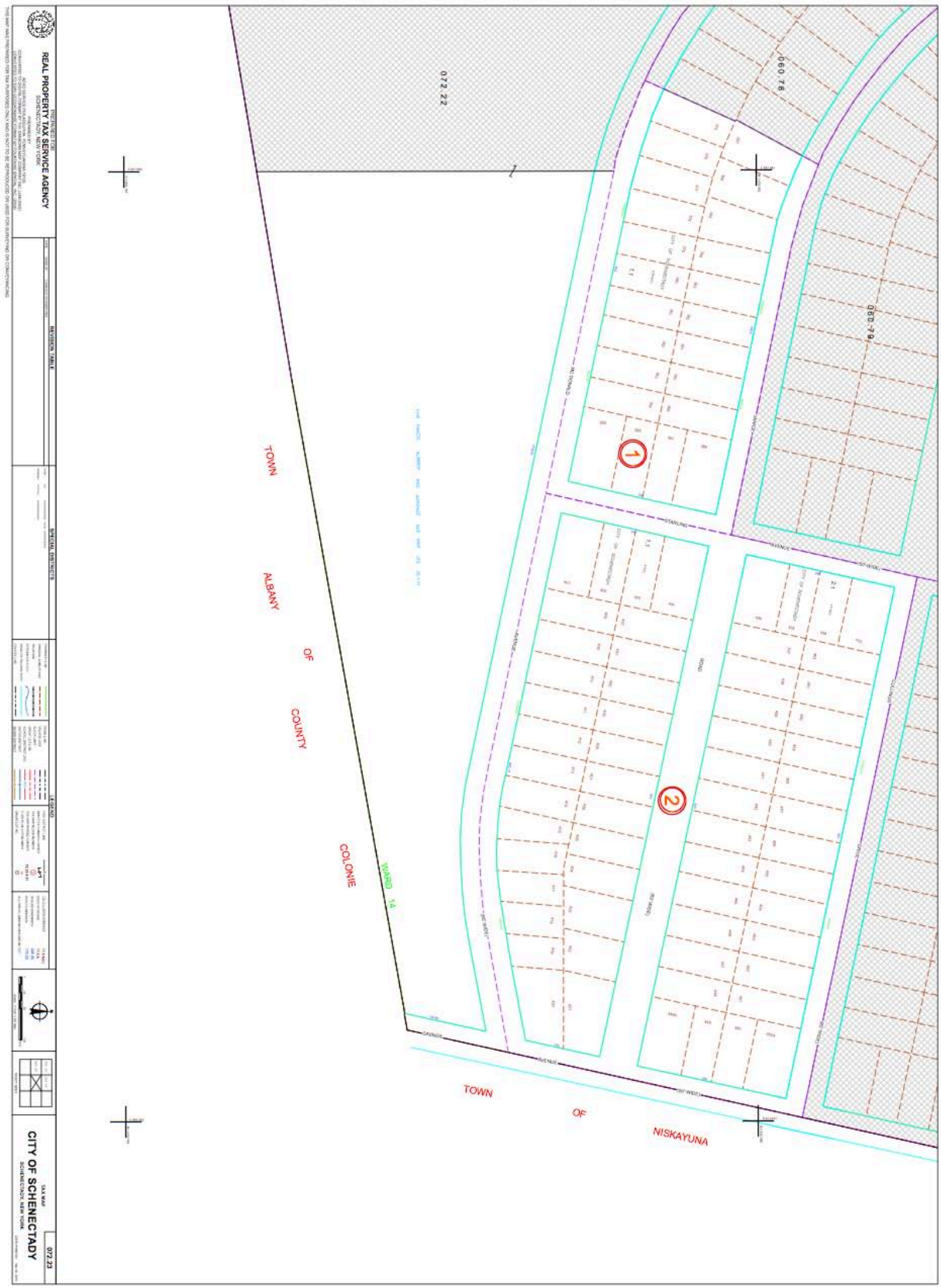
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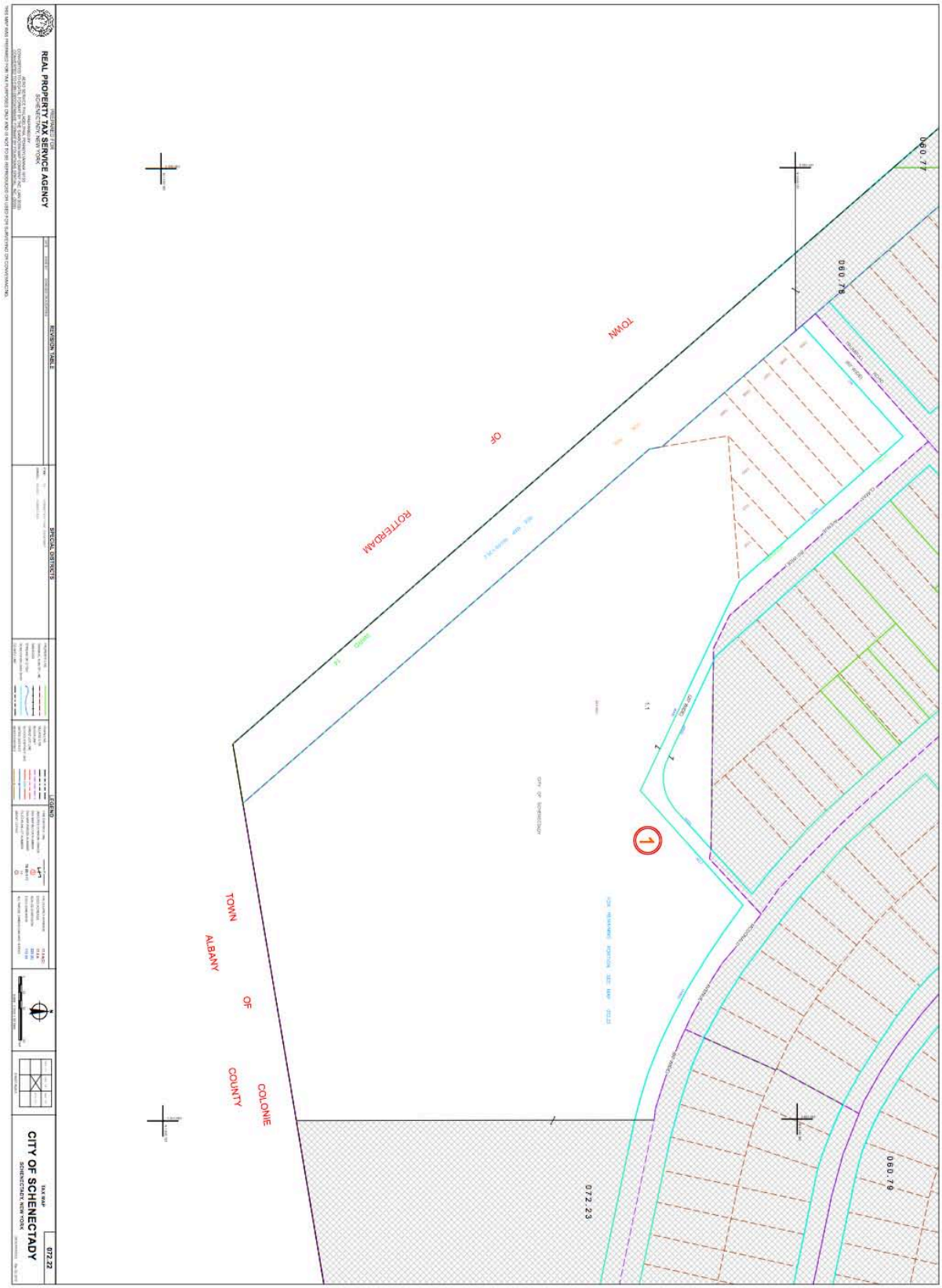
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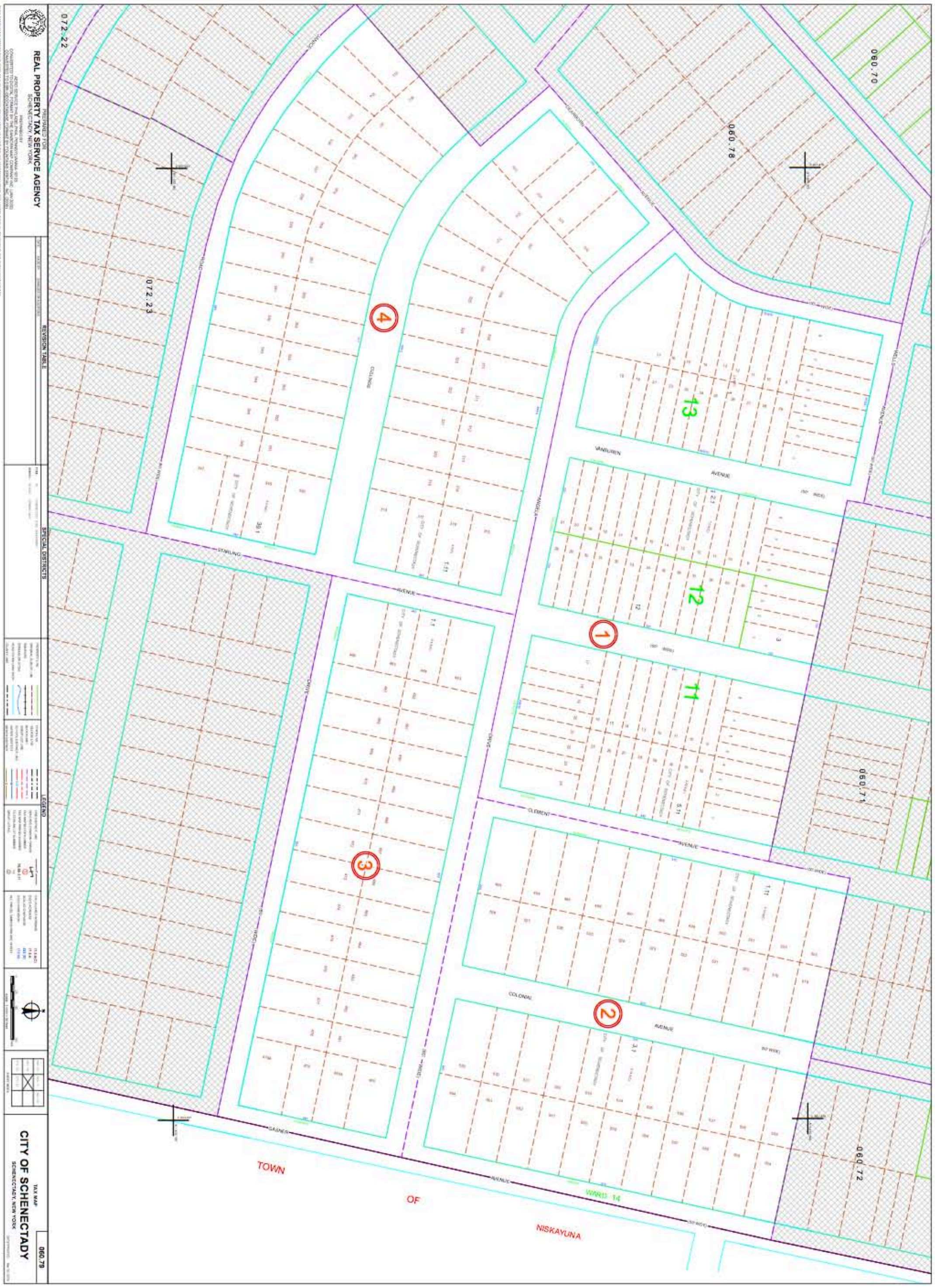
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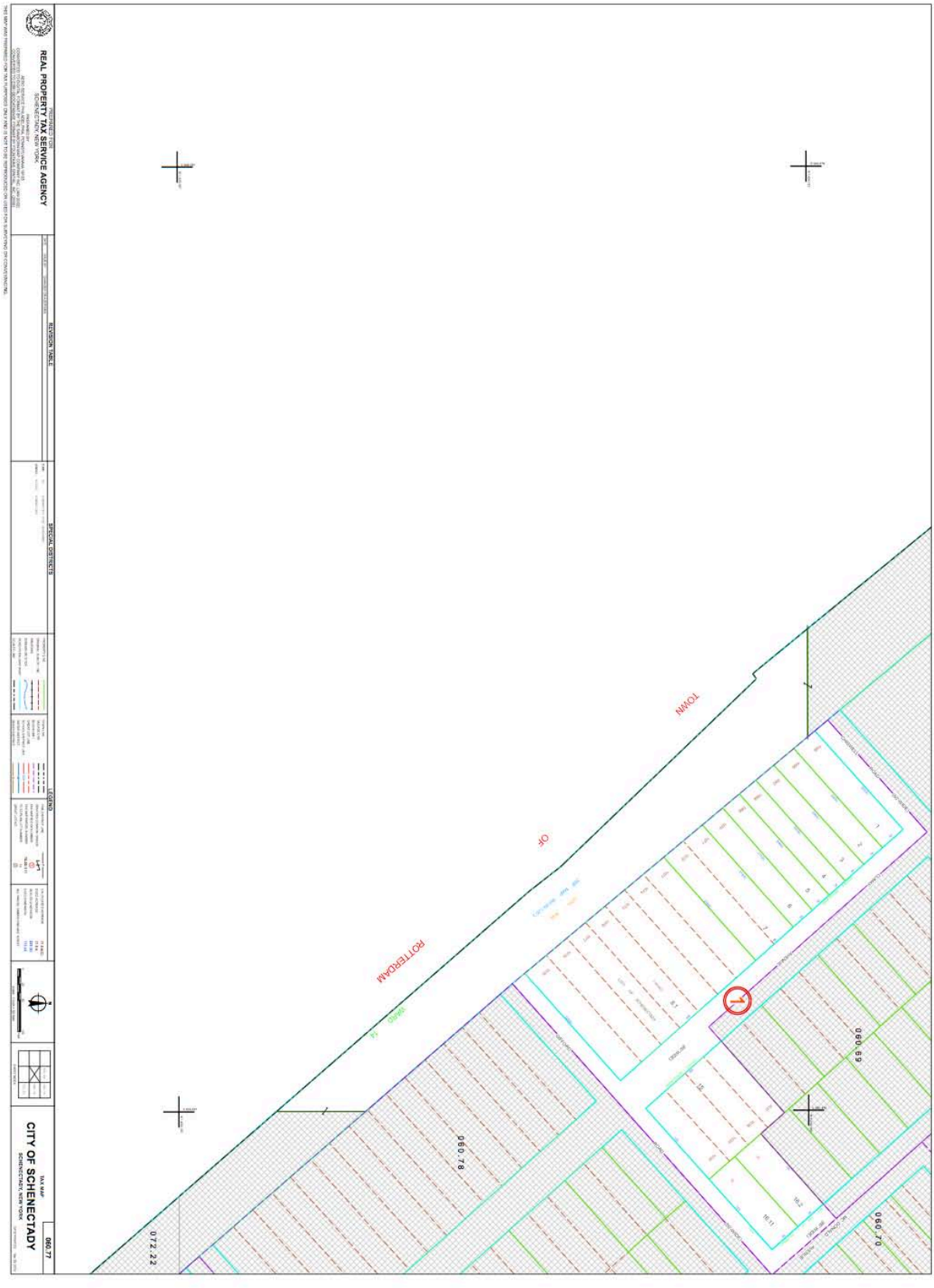
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Appendix 5

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