

EXHIBIT 1

POPE LAND COMMITTEE REPORT

January 12, 2021

Pope Land Committee

Overview

Pope Land Committee (PLC) Charge (March 2018) by Board of Selectmen, Salisbury, CT:

The committee will meet at least bi-monthly (minimum of 6x per year) to review uses for the 59-acre former Pope property on Salmon Kill Road. Uses may include housing, conservation, recreation, economic development, agriculture and other uses as suggested by the citizens of the Town. The committee will meet in duly noticed public meetings and will report to the Board of Selectmen semi-annually and the Town Meeting annually. The Selectmen will elect the first Chairman and the town will provide secretarial and administrative services. It is likely that the committee would elect a Vice Chairman in the early meetings.

The PLC, along with First Selectman, Curtis Rand, held its first meeting on March 28, 2018. Mr. Rand outlined the charge, with the expressed purpose to review options for the multiple uses of the land and report back to the Board of Selectman on a periodic basis. Topical meetings were planned by the committee to explore potential uses. Those included: a presentation from the Salisbury Historic District Commission; reviews of soil and survey maps; presentations by four (4) Salisbury Housing Organizations; overviews from the Inland Wetlands and Conservation Commission, Recreation Commission, Economic Development Committee and a review of the CT DEEP Natural Diversity Data Base Map (NDDDB).

In addition to understanding the land uses of the Pope property, the PLC emphasized opportunities throughout the term of the Committee to solicit ideas from citizens of Salisbury for additional uses. The PLC held 17 meetings starting in March of 2018 and ending in November of 2019. Over this two-year period, all meetings were open to the public, with time for public comment on every agenda. A special invitation for the public to attend the May 22, 2019 meeting was published in the May edition of the Salisbury Sampler and posted on the Town website. The public was invited to attend the meeting so the Committee could hear from the citizens of Salisbury with suggestions for uses in addition to recreation, conservation, housing and agriculture. Additional ideas that arose from the public meeting were: enclosed tennis courts, a YMCA-type facility, opening up and maintaining more hiking trails, as well as a number of comments about the need for affordable housing. A special event was organized for Saturday, October 12, 2019, during Fall Festival. There was a notice in the Salisbury Sampler and the Lakeville Journal, as well as a posting on the Town website. The PLC had a walking tour of the Pope property with a tent set up the Rail Trail between the small bridge near Railroad Street and Salmon Kill Road. Committee members explained property maps and answered many questions. A path was mowed in the rear of the property for easy access and walking.

Updates of the Committee's progress were made to the Board of Selectmen on October 1, 2018, May 6 and August 5, 2019 by Chairman Tom Callahan.

The last meeting of the PLC was on November 20, 2019, at which time all Committee members were asked to prepare overall comments on both their expertise brought to the Committee and insights to share based on the research that was performed over the 20-month period of review of uses of the 59 acre former Pope property on Salmon Kill Road.

The minutes of every meeting are posted on the Town website.

In addition, all maps and ecological reports are attached by addendum.

Addendum (1) Map prepared for the Town of Salisbury by Mat Kiefer on 10/6/2017 for the purchase of the 59 acre Pope property.

Addendum (2) Soil Report prepared by Pat Hackett on May 23, 2018 for presentation to the PLC.

Addendum (3) Soil Science and Environmental Services, Inc. reports prepared in May 2019

- (a) Wetlands/Watercourses and Soil Report
- (b) CT DEEP NDDP Listed Species Habitat Review , including Mat Kiefer review and definitions of endangered, threatened and species of special concern

Addendum (4) Map prepared for the Town of Salisbury by Mat Kiefer on September 30, 2019 showing portion of land under review for future uses. (It should be noted that further study would be required if a portion of the land within the 40.2 acres of area not under review could be utilized.)

The delay in the final report presentation to the Salisbury Board of Selectmen was caused by the impact of the COVID-19 pandemic circumstances.

Pope Committee Members

Thomas M. Callahan, Chairman

Mr. Callahan is Vice-Chairman, Salisbury Historic Districts Commission

Mat Kiefer, Vice-Chairman

Mr. Kiefer is Vice-Chairman, Salisbury Board of Finance

Sally Spillane

Ms. Spillane is a member of the Salisbury Inland Wetlands Commission

Lisa McAuliffe

Ms. McAuliffe is Salisbury Recreation and Senior Services Director

Jim Dresser

Mr. Dresser is a member of the Salisbury Affordable Housing Commission

Marty Whalen

Mr. Whalen is Secretary, Salisbury Planning and Zoning Commission

Georgia Petry, Administration/Recording Secretary

Perspectives from Commission Members

Each Commission member prepared their own comments for this report. They are being presented, as submitted, without edit. (Only modifications to font type and size were made for consistency.)

PLC Report to Salisbury Board of Selectmen

Prepared by Thomas M. Callahan

Vice Chairman, Salisbury Historic Districts Commission

On March 25, 2018, I gave a detailed presentation to the PLC on rules and procedures of the SHDC.

The Ordinance establishing the Salisbury Historic District Commission located in the town of Salisbury Ct was passed on February 19, 1970. On July 16, 1971 under Ordinance #27 the historic district in the center of Salisbury was extended to include the Miner and Pope fields. (Ordinance #27 attached) The SHDC is organized and operated under the authority set forth in Chapter 93a; Section 7-147 of the Statutes of the State of Ct. The intent of the SHDC is to preserve the distinct character of our community dating from different periods in history. Of the non-wetland area under review for future uses (19.2 acres) app. 9.7 acres are within the Salisbury Historic District. Town building and zoning officials will require a SHDC Certificate of Appropriateness approval before issuing a permit of activity within the 9.7 acres. The Ct. State enabling law and SHDC's Rules and Regulations require that the following standards be used in determining appropriateness as outlined in the Rules and Procedures which can be obtained at the Salisbury town hall or on our website (www.HistoricSalisburyCT.com).

- **Historical and architectural value and significance**
- **Architectural style**
- **Scale**
- **General design**
- **Arrangement**
- **Texture and material of the architectural feature**
- **Types and style of exterior windows, doors, light fixtures, signs, above ground utility structures, mechanical appurtenances.**
- **Type and texture of building materials.**
- **The relationship to the exterior architectural style and pertinent features of other outdoor buildings and structures in the neighborhood and district.**

More specific guidelines and briefs are provided by the U.S. Secretary of the Interior to aid homeowners in historic districts. These can be reviewed at:

[www.nps.gov/history/hps/tps/standards_guidelines .htm](http://www.nps.gov/history/hps/tps/standards_guidelines.htm)

as it originates from the point of beginning to said point for a total distance of about 500 feet.

(b) The boundaries of the Historic District in Lakeville encompass the following areas, buildings, and their adjacent properties:

The Village Park, Miss Margaret Williams' house, The Farmington Apartments, The Mansfield Apartments, the Lakeville Hose Company building, the old Raynsford Carpenter Shop, the Visiting Nurse Association and Welfare Association building, the 1866 Holley Manufacturing Company building and the 1887 Holley Manufacturing Company building, and the Salisbury Bank & Trust Company building.

The proposed Historic District in the village of Lakeville is roughly a rectangle. Starting at the southwest corner of Miss Margaret Williams' property on the north side of Main Street and following the western boundary of said property for some 230 feet northwesterly, thence at a right angle easterly for about 400 feet, crossing the property of Miss Williams so as to include all of the five outbuildings pictured closest to the house on the Sanford map of 1899, and continuing across that of Mr. Frederick Miles and of Mrs. Ruth V. Mansfield to the easterly boundary of said Mansfield property, thence southeasterly along said boundary some 250 feet to Main Street.

Thence crossing Main Street about 60 feet southeasterly to the corner of its intersection with Route 41 and southeasterly along the west side of the latter to the southeast corner of Ethan Allen Street. Thence about 320 feet westerly along the south side of Ethan Allen to a point, and thence at an angle northerly across the latter and along the west side of Holley Street some 400 feet to the corner of Main. Thence diagonally across Main Street about 200 feet to the southwest corner of Miss Williams' property, the initial point of departure.

Section 3. An Historic District Commission is hereby established, consisting of five (5) members who shall be electors of the Town of Salisbury, holding no salaried municipal office. The members of the Commission shall be appointed by the Selectmen for terms of five years with the appointments so arranged that the term of at least one member shall expire each year, and their successors shall be appointed in like manner for terms of five years. Five alternate members of the Commission shall be appointed in like manner.

Section 4. The Commission shall elect annually a Chairman, a Vice-chairman and a Clerk from its own number. All members shall serve without compensation. The Commission shall adopt rules of procedure and other rules, regulations and orders pursuant to and consistent with the General Statutes relating to Historic Districts; and to facilitate compliance, may adopt a standard form of application for a certificate of appropriateness requiring such information as may be necessary for the Commission to carry out its duties.

Amendment July 16, 1971

First amendment to Ordinance #27 Establishing Historic Districts in the Town of Salisbury, Connecticut - the original ordinance having been passed on February 19, 1970.

Under Section 2 (a). To extend the Historic District of the center of Salisbury to South on both sides of Main Street, (Route 44) being the tract which was known for years as "Stiles Meadow" and consisting of the following properties:

Ellsworth and Newsom open fields as part of Stiles Meadow.

Francis Stiles House now owned by Miss Agnes Fowler.

Congregational Church Parsonage.

Benjamin Stiles House now owned by Miss Nathalie Hopper.

Rectory of St. John's Church.

John Currie House.

Hugh McMillan House.

Richard A. Kimball House.

Dr. F. E. Smith House.

Miner and Pope open fields as part of Stiles Meadow.

Starting at the southwest corner of the existing historic district, the line runs in a southerly direction parallel to Main Street (Route 44) across the properties of Helen Ellsworth, Earl Newsom, and to the southern boundary of the property of Agnes Fowler, a distance in all of approximately 1090 feet; thence easterly along the Fowler property line to Main Street; thence northerly along Main Street approximately 85 feet; thence across Main Street in line with the southern boundary of the Congregational Church Parsonage approximately 150 feet from Main Street; thence northerly along the eastern line of the Congregational Church property to a point on the northern side of Lime Rock Road, thence along said road by the property of Nathalie Hopper and extending approximately 450 feet beyond the old railroad right of way, thence northerly in a line parallel to the said right of way approximately 1350 feet across the properties of Robert H. and Dorothy P. Miner and Gustavus D. Pope to the Wachocastinook Creek, thence westerly to the southeastern corner of the existing historic district, all as shown on area map No. 3 entitled "Map of Proposed Extension of the Salisbury Historic District".

To establish the following additional historic districts:

(c) "The Landon House" historic district as show on Site Plan #4.

The boundaries of this proposed district are as follows;

Starting at the southwestern corner the line runs northwesterly parallel to Route 112, 250 feet, thence at a right angle northeasterly 100 feet, thence at a right angle southeasterly 250 feet, thence at a right angle southwesterly 100 feet to the starting point.

(d) "The Fitch-Demarest House" historic district as shown on Site Plan #5.

Boundaries of this historic district are to be as follows:

Starting at the northeastern corner of the property, the line runs southerly along the Lakeville to Sharon road approximately 276 feet; thence slightly southwesterly along Route #112 approximately 375 feet; thence northerly approximately 529 feet; thence easterly at a slightly acute angle approximately 502 feet to the starting point.

(e) "Hollywood" historic district as shown on Site Plan #8.

Boundaries of this proposed historic district are as follows:

Starting at the easterly corner of the property on Route 44, the line runs southerly 147 feet, thence at a right angle westerly 62 feet, thence at a right angle southerly 330 feet, thence easterly 79 feet, thence southerly approximately 123 feet, thence westerly in a curved line approximately 600 feet, thence southerly 340 feet, thence along the shore of Lake Wononscopomuc approximately 554 feet, thence northerly approximately 650 feet, thence easterly parallel to Route 44 approximately 1039 feet to the starting point.

(f) "The Lord-Haas House" historic district as shown on Site Plan #7.

Boundaries of this historic district are to be as follows:

PLC Report to Board of Selectmen
Planning & Zoning Perspective
Marty Whalen, Secretary, Salisbury Planning & Zoning Commission

The Planning & Zoning Commission has established guidelines for the future of the Town in the 2012 Plan of Conservation and Development (POCD). The Plan has strategies for the preservation of natural resources, working landscapes and community character, including the protection of open spaces. The Plan lists preserving critical habitat for a wide variety of plants and animals as important. Another goal in the Plan is to minimize or avoid wetland disturbance and filling.

The Plan encourages the development of affordable housing, workforce and senior citizen housing options in order to preserve and support our human resources.

The total area of the Pope property contains approximately 59.4 +/- acres. It contains approximately 19.2 +/- acres of non-wetland field area which includes 9.7 +/- acres in the Historic District Area. It contains approximately 40.2 +/- acres of designated wetlands and woods traversed by 3 named brooks and other intermittent watercourses.

The Pope property is located within 3 residential zones, the R-20, RR1V and RR1. The R-20 area is along the front of the property on Salmon Kill Road.

PLC Report to Board of Selectmen
Prepared by Jim Dresser
Member, Salisbury Affordable Housing Commission

The Pope Committee devoted its July 25, 2018 meeting to listening to members of the four local, volunteer organizations that build or renovate housing for Town residents. Each organization described its **mission, membership, history, achievements, and goals.**

1. Salisbury Affordable Housing Commission (SAHC): a nine-member, Town commission created by **ordinance** to assist the local organizations building housing units **and to administer** the Salisbury Affordable Housing Fund.
2. Salisbury Housing Committee (SHC): a local not-for-profit organization that creates and maintains low- and moderate-income rental housing. In addition to local funding, it has secured government grants to make these projects affordable. It has developed and owns 33 units, including Sarum Village, Sarum Village II, and Faith House. The SHC is developing another project, Holley Place, which will add **12 units** on Town land near the intersection of Routes 41 and 44 in Lakeville. **The SHC's existing units** are all occupied and oversight is provided by experienced property managers.
3. Salisbury Housing Trust (SHT): a local not-for-profit organization that creates and maintains single-family ownership units. The SHT retains ownership of the land and enters into contracts with the owners regarding resale so the homes can remain affordable. The Trust has built or renovated 14 houses in Lakeville and Salisbury since 2000. It has been supported by local donations, the Town, and the McChesney Fund.
4. Habitat for Humanity of Northwest Connecticut (Habitat): the local entity of a national not-for-profit organization that creates and maintains single-family ownership units (Habitat is completing its third house in Town). Habitat retains ownership of the land, which helps make the homes affordable year after year.

All four housing organizations expressed strong interest in utilizing a portion of the Pope property because it can accommodate ideal sites for affordable housing, **including being** within walking distance of the **Village** of Salisbury and on Town water and sewer. They stressed that the paucity of affordable land is their main impediment.

They stated that the construction of units on portions of the Pope property would assist them in meeting the goals of the Salisbury Affordable Housing **Plan, which** was proposed by the SAHC and adopted by the Board of Selectmen in 2018, after public forums in 2017 and 2018, attended by more than 100 citizens each.

The goal of the 2018 Salisbury Affordable Housing Plan is to build or renovate 15 single-family and 60 rental units within 10 years. This would raise Salisbury's percentage of housing units that are affordable from its current level of 2.1% to 5%. (The State's mandated level is 10%)

The Pope Committee did not ask the four organizations for their specific **"wish lists"**.

**PLC Report to Board of Selectmen
Prepared by Lisa McAuliffe
Director of Recreation and Senior Services**

The Pope property is located adjacent to one of the Town's current recreation sites, known generally as Trotta Field. The property is also adjacent to the Housatonic Day Care Center, Salisbury Visiting Nurse Association and the Community Garden. Given the Pope property's proximity to an already existing recreation area, it would be an ideal location to allow for expansion of the Town's current recreation program.

Currently, the recreation department uses 5 different locations in town to run programs for the residents of Salisbury.

Trotta Field is currently used for rec baseball which includes programs for participants ages 5-12. The Salisbury Central Middle School soccer teams play their home games at Trotta Field. There is a U14 sized soccer field and two 60ft base path baseball fields. There are also two basketball courts, a batting cage and a storage shed on the property.

Community Field is used for our fall U10 and U12 soccer program. Approximately 4-6 teams use the field for weekly soccer practices and games. There is also a softball field and a 90ft base path baseball field. The softball field is used weekly, May-September for a community game that has been ongoing for over 30 years. The Town tennis/pickle ball courts and a single basketball hoop are also located at Community Field. In 2019, pickle ball lines were added to 2 of the 3 tennis courts. While this has created an opportunity for Salisbury residents to participate in the fastest growing sport for senior citizens in the county, we quickly discovered that 2 courts were not enough to meet the growing demand for court time.

There is a small rec field at Salisbury Central School which hosts our U8 soccer program. The Mini soccer program meets on the Salisbury Central School field. Other recreation programs that meet at the Salisbury Central School gym include gymnastics, and youth and adult basketball.

The Hotchkiss School is home to the youth lacrosse program, adult lap swim, indoor walking program, regional 3rd and 4th grade basketball and public ice skating.

The Town Grove is where summer programs meet and the Town paddle courts are located. The Town's Senior Center is also located on the property. The Recreation/Senior Services Director and the Grove manager's offices are located in the Senior Center. Programs that meet at the include swim lessons, sailing lessons, kayaking lessons, and swim team. Paddle tennis courts are open from Labor Day through Memorial Day. Senior programs include the senior nutrition program, exercise class, tai chi, ping pong, pontoon boat rides and monthly pot lucks. The senior center is also rented during the non-summer months for weddings and other functions.

Dedicating the Pope property to recreation could have an extremely positive impact on our community. Relocating all of our soccer fields to one location and expanding the current recreation area could be helpful to parents with multiple children, making it easier to get participants to and from games and practices. By adding a walking track, pickle ball courts and a playground to the area, the Pope property/Trotta Field could become a family friendly, multi-generational community center with something for everyone.

Parking is currently an issue at Trotta Field; adding a designated parking area would greatly increase safety.

While an official plan has not been produced, some possible uses could include the following, should any land be dedicated to recreation:

- A walking track
- Expanded soccer fields
- A playground
- Improved basketball court
- Pickle ball courts
- A pavilion
- Improving the bike path to provide a safe pedestrian connection between the Villages of Salisbury and Lakeville
- Improved parking

Lisa McAuliffe,
Director of Recreation and Senior Services

**PLC Report to Board of Selectmen
Prepared by Sally Spillane
Member, Inlands Wetlands Commission**

It was an honor to sit on the Pope Land Committee, as a member of the Salisbury Conservation and Inland Wetlands Commission. The Pope property is an extraordinary addition to our Town.

The Pope Committee has done a wide- ranging preliminary assessment of the property from geology, soil types, wetlands boundaries and species of concern to the boundaries of the Salisbury Historic District. We heard from several Committees concerning possible uses and ideas from the community to utilize this land in a way that benefits out town. My letter is from my perspective as the Conservation and Inland Wetlands Commission (CIWC) representative and attempts a short recap of that portion.

At a meeting with CIWC chairman, Larry Burcroff and Administrator Ruth Mulcahy, with the Pope Committee on Sept 26, 2018, Ruth Mulcahy asked that there be a comprehensive soil science report as there appeared to be a lot of sensitive issues on the property. She noted that regulations include a 100' setback from brooks and streams and that this is a prime environmental area. We were asked to look at rare and endangered species.

Please refer to the January 31, 2019 letter from Karen Zyko from the CT DEEP, which contains the preliminary assessment of this property from the Natural Diversity Database. In her letter, she states: "To prevent impacts to State-listed species, field surveys of this site should be performed by a qualified biologist when these target species are identifiable. Botanical surveys should be performed by qualified botanist when this target species is identifiable."

Please review the subsequent letter (May 31, 2019) from Jennifer Beno, Biologist /Wetland Science of Soil Science and Environmental Services, Inc., concerning her inspection of approximately 32 acres as an "area of concern". This includes the list of species that are Threatened, Endangered and of Special Concern. Please note that only the 32 acres of special concern have been analyzed.

Two significant brooks meet on the Pope Land, Moore Brook and Wachocastinook Creek. The property is part of large habitat corridor and a fairly pristine connected wetland system. This open space in the center of Salisbury is an enormously valuable resource.

**Sally Spillane
Member of the Salisbury Conservation and Inland Wetlands Commission**

PLC Report to the Board of Selectmen
Mat Kiefer
Salisbury Board of Finance

My thoughts regarding the Salmon Kill Road Pope land are as follows:

This land is a jewel to our town. The walking trail (the old railroad bed) is along the west side of the property. As I walk or ride my bike along the trail, the view across the fields and into the woods is beautiful. This past fall, the Board of Selectmen had a new trail created through the woods, which has certainly "opened up" this land for all of us to see. Having this open land alongside this walking/biking trail makes a very convenient and beautiful way to get to both Villages.

At the present time, the Board of Selectmen has been listening to different Commissions and Committees about different housing needs in the Salisbury. There are a several sites and buildings, other than the Pope property that have been discussed.

The current use of the Pope property is great. Farming is beautiful. A few years ago, the harvesting of hay on the Pope property was on the front cover of the annual Salisbury Town Report. That was a beautiful cover.

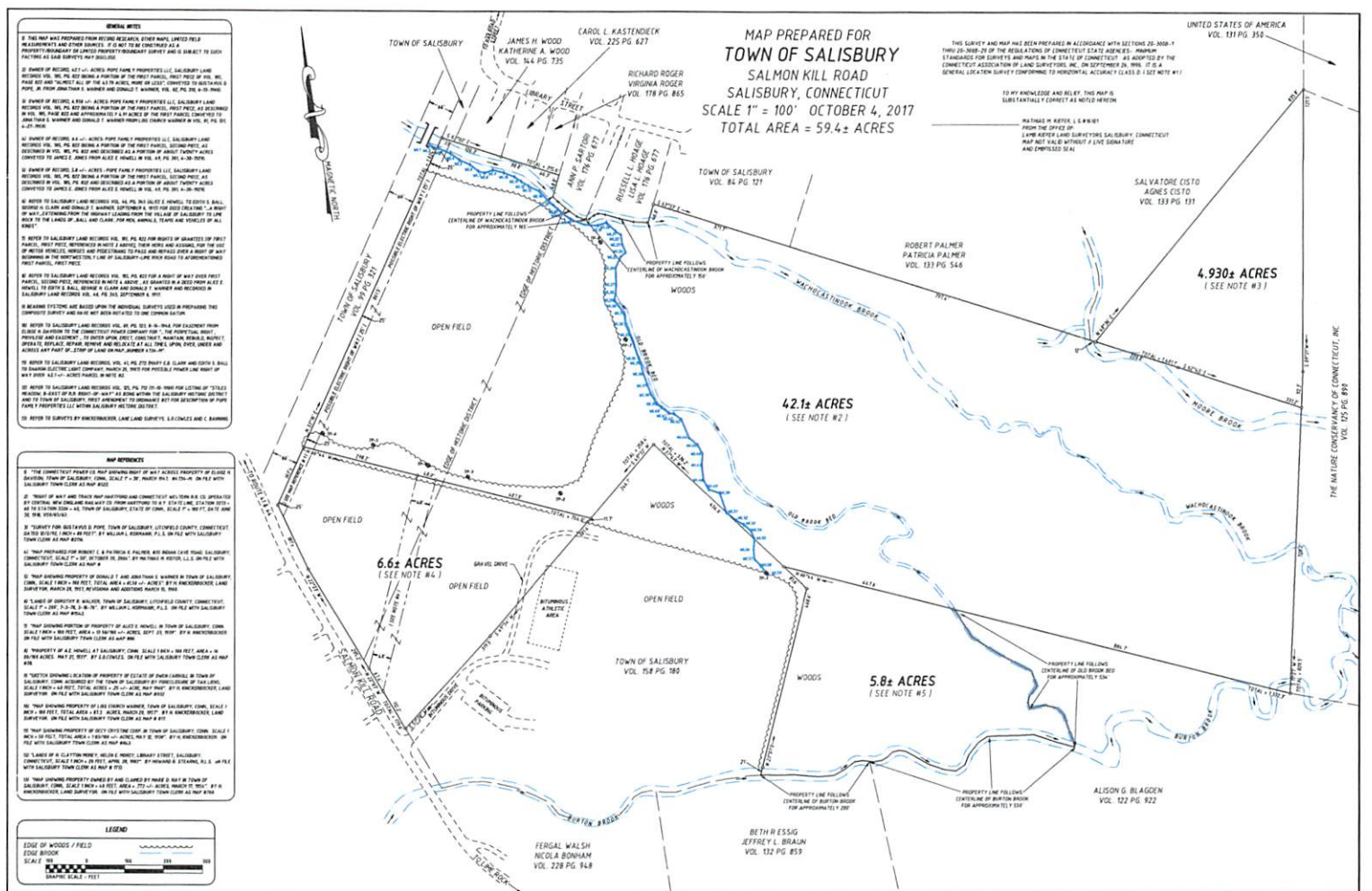
The current athletic fields are important to our Town's children. If more athletic fields are needed, this is where those fields should be built. Having all the fields in one place makes sense.

The Pope land should be used for recreational uses. I believe that our Town will continue to grow and we will need this land for recreational uses.

It is my opinion that this property should stay the same or become athletic fields for the next one or two decades. If needed, and decades from now, this property could always be turned into housing sites.

We should not rush. Let us take our time. Do right by this land. It is too nice. Respect it. I am tired of seeing houses in the middle of fields.

("Jim Dresser dissociates himself from this page (p.12 of 92) in its entirety. It was never discussed, modified, or voted on by the full committee.")



MAP PREPARED FOR
TOWN OF SALISBURY
SALMON KILL ROAD
SALISBURY, CONNECTICUT
SCALE 1" = 100' OCTOBER 4, 2017
TOTAL AREA = 59.4± ACRES

THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 35, 36B-1, 37 AND 38, SUBSECTION 23 OF THE REGULATIONS OF UNINCORPORATED TOWN AGENTS - PRACTICE STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT, AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 29, 1993. IT IS A GENERAL LOCATION SURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS B. (SEE NOTE #1)

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREIN.
PATRICK M. KETTEL, L.L.M.
FROM THE OFFICE OF
LAW OFFER LAND SURVEYS SALISBURY, CONNECTICUT
MAP NOT VALID WITHOUT A LIVE SIGNATURE AND EMPLOYED SEAL

UNITED STATES OF AMERICA
VOL. 131 PG 350

SALVATORE CISTO
AGNES CISTO
VOL. 133 PG 131

ROBERT PALMER
PATRICIA PALMER
VOL. 133 PG 546

THE NATURE CONSERVANCY OF CONNECTICUT, INC.
VOL. 125 PG 899

ALISON G. BLASGEN
VOL. 122 PG 922

BETH B. ESSIG
JEFFREY L. BRAIN
VOL. 132 PG 859

FERGAL WALSH
NICOLA BONHAM
VOL. 228 PG 948

GENERAL NOTES

- 1. THIS MAP WAS PREPARED FROM RECORD RECORDS, OTHER MAPS, LIMITED FIELD MEASUREMENTS AND OTHER SOURCES. IT IS NOT TO BE CONSIDERED A PROPERTY SURVEY OR A PROPERTY BOUNDARY SURVEY AND IS SUBJECT TO SUCH FUTURE SURVEYS AS MAY BE REQUIRED.
- 2. OWNER OF RECORD, JET J. ACRES, 1987 FAMILY PROPERTIES LLC, SALISBURY LAND RECORDS VOL. 101 PG 469, SHOWS A PORTION OF THE FIRST PARCEL, LOT 100, PG. 469, AND A PORTION OF THE LOT 101, WHICH FRONT TOWN OF SALISBURY ROAD. THE REST OF LOT 100 AND LOT 101 ARE OWNED BY JET J. ACRES, 1987 FAMILY PROPERTIES LLC, SALISBURY LAND RECORDS VOL. 101 PG 469.
- 3. OWNER OF RECORD, JET J. ACRES, 1987 FAMILY PROPERTIES LLC, SALISBURY LAND RECORDS VOL. 101 PG 469, SHOWS A PORTION OF THE FIRST PARCEL, LOT 100, PG. 469, AND A PORTION OF THE LOT 101, WHICH FRONT TOWN OF SALISBURY ROAD. THE REST OF LOT 100 AND LOT 101 ARE OWNED BY JET J. ACRES, 1987 FAMILY PROPERTIES LLC, SALISBURY LAND RECORDS VOL. 101 PG 469.
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MAP ABSTRACTS

- 1. THE CONNECTICUT POWER MAP SHOWING THE MAP ABSTRACTS OF LOT 100 ACRES PROPERTY OF JET J. ACRES, 1987 FAMILY PROPERTIES LLC, SALISBURY LAND RECORDS VOL. 101 PG 469.
- 2. THE TOWN OF SALISBURY HAS BEEN INCORPORATED INTO THE STATE OF CONNECTICUT AS A TOWN IN THE YEAR 1805. THE TOWN OF SALISBURY IS BOUND BY THE STATE OF CONNECTICUT TO THE SOUTH AND WEST AND BY THE STATE OF VERMONT TO THE NORTH AND EAST. THE TOWN OF SALISBURY IS BOUND BY THE STATE OF CONNECTICUT TO THE SOUTH AND WEST AND BY THE STATE OF VERMONT TO THE NORTH AND EAST.
- 3. THE TOWN OF SALISBURY IS BOUND BY THE STATE OF CONNECTICUT TO THE SOUTH AND WEST AND BY THE STATE OF VERMONT TO THE NORTH AND EAST. THE TOWN OF SALISBURY IS BOUND BY THE STATE OF CONNECTICUT TO THE SOUTH AND WEST AND BY THE STATE OF VERMONT TO THE NORTH AND EAST.
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- 5. THE TOWN OF SALISBURY IS BOUND BY THE STATE OF CONNECTICUT TO THE SOUTH AND WEST AND BY THE STATE OF VERMONT TO THE NORTH AND EAST. THE TOWN OF SALISBURY IS BOUND BY THE STATE OF CONNECTICUT TO THE SOUTH AND WEST AND BY THE STATE OF VERMONT TO THE NORTH AND EAST.

LEGEND



The Pope Parcel Salisbury, Connecticut



Soils

May 23, 2018

by: Pat Hackett

Soil Mapping – Pope Parcel, Salisbury, Conn.

Soils in the State of Connecticut have been identified and cubbyholed by the Natural Resource Conservation Service (NRCS), formerly called SCS (Soils Conservation Service which gives claim to why the soils were classified to begin with).

As part of the classifying of soils, several factors are considered and rated and then cubbyholed into a 3-dimensional matrix. The three “dimensions” are:

1. Slope of the soil formation – How steep is the grade?
2. Drainage Classification of the Soil – How fast or slow does the soil pass water and where is the watertable?
3. Composition of the soil – How it was deposited, Lithology of the material, and texture of the soil?

1. Slope of Soil.

NRCS uses an A, B, C, D, or E to signify the average slope of the land. Soils slopes are typically:

- | | |
|---|----------------|
| A | from 0 to 3 % |
| B | from 3 to 8 % |
| C | from 8 to 15 % |
| D | from 15 to 25% |
| E | from 15 to 35% |

Soil Slope is not mutually exclusive of soil deposition (part of third criteria) since an alluvially deposited soil is not naturally steep.

2. Drainage Classification of Soil

The term “drainage class” is an empirical term relating more to the depth of any seasonal highwater table and location on the landscape than a measurable property of the soil. There are seven (7) different categories of drainage:

- Excessively
- Somewhat Excessively
- Well
- Moderately Well
- Somewhat Poorly
- Poorly
- Very Poorly

The last two classes, Poorly and Very Poorly, are by State Statute classified as a wetland soil.

A sandy soil can range from Excessively to Very Poorly Drainage Class. Seasonal High Groundwater is dependent on the amount of rainfall and the boundary conditions of the underlying bedrock along with other factors such as stratification of deposition, transition from glacial to other type of deposition or a preconsolidated layer of the same soil material (hardpan).

3. Composition of the Soil

Here in the northwest corner of the State the soils are primarily composed of broken-down Stockbridge Marble. The Stockbridge Marble formation is the same formation in upper Manhattan called Inwood Marble that was deposited 500 to 570 million years ago (mya). There are some schists, granite and gneisses from the Walloomsac Schist Formation (435-500 mya) at the northeastern portion of the parcel.

A. Deposition of the Soil

There are two types of soils – cohesive and non-cohesive. Cohesive soils are clays and there is very little to no clay found on the Pope Parcel. Clays are chemically formed, very small, and platy, have very low permeability, cohesive by nature. Non-cohesive soils are mechanically made by frictional forces of air, water, pressure, are

angular in nature and are prevalent in Salisbury. The soil size ranges from very large boulders called erratics, to silt. Silt is a particle that is small that the grit of a 200 sandpaper. Soil deposition was caused by the glaciers during the last ice age. Various depositions are:

- Glacial Till – When everything a glacier dragged along melts out and remains – Unstratified Sand, Silt, and Rock.
- Glaciofluvial – When the receding glaciers washed out finer material and left stratified sand and gravel.
- Glaciolacustrine – When glacial water sorts the soil particles and the clays settle out rather than being washed downstream as in the glaciofluvial deposition
- Alluvial – When water (stream, brooks, rivers) creates stratified sand and silt.

B. Lithology

The various tectonic forces of mountain-building have left many types of rocks in the area. The oldest rock is a highly metamorphosed schist, gneiss, and granite. The marble was formed from dead sea life in a shallow sea (Iapetus Ocean) and was metamorphosed into marble in during the Taconic Orogeny (440 mya).

C. Texture Group

Depending on how much and how many times the broken bedrock has been worked-over and how much of the newly formed soil is mixed with surrounding soils will determine the ultimate texture group. There are many silt soils that people call clay but are not true clay. An easy test to determine if a clump of soil is a silt or clay (better phrased a non-cohesive versus a cohesive soil) is to put the clump of soil in a jar of water and see if the clump is still intact the next day. Some silts act like they have cohesiveness until they are saturated and the surface tension between the tight particles cannot occur. When this happens, silt loses the negative pore pressure than creates friction between the soil particles and the particles fall apart under gravity.

What makes soils of different quality for different functions?

Many ideas of what the Pope Parcel should be used for have been suggested. The main landuse functions that come to mind are:

1. Farming
2. Recreational
3. Housing

1. Farming – Qualities that are beneficial to farming are:

- Well-graded soil with a lot of fines to retain moisture
- A high watertable is good as long as the soil can drain
- Relatively flat grades so erosion is minimal
- A balanced blend of organic, and inorganic material.
- An optimal pH to maximize the uptake of nutrients

2. – Recreational use of a soil is similar to what farming needs. An additional requirement would be a soil that does not turn to rock when dry (tough on knee caps...)

3. Housing

- Deep drained soils are good for dry basements
- Sand and gravel is good when a minimal amount of material is found unsuitable for road base or backfill.
- Relatively flat grades make cutting and filling a minimum

Soil Types - Pluses and Minuses

- Clay – Very poor foundation bearing, very impervious, can be expansive. Good for toothpaste
- Silt – Not so good for foundations but better than clay. So fine it is difficult to compact and will require more quality fill is hauled in.
- Sand – When well-graded (a lot of different particle sizes, sand can provide good bearing and is and is compactable when not too moist. Can dry out too quickly.
- Gravel – Good bearing capacity. Dries out too quickly. Easy to work with.

| Soils found on the Pope Parcel | | | | | | |
|------------------------------------|--|---|-------------------------------------|-----------------------|--------------|----------------|
| Map Unit Symbol | Map Unit Name | Deposit | Lithology | Texture Group | Acres in AOI | Percent of AOI |
| 22A | Hero gravelly loam, 0 to 3 percent slopes | Glaciofluvial | Mixed Limestone & Crystalline | Loamy / Sand & Gravel | 3.2 | 5.40% |
| 31A | Copake fine sandy loam, 0 to 3 percent | Glaciofluvial | Mixed Limestone & Crystalline | Loamy / Sand & Gravel | 12.1 | 20.30% |
| 31B | Copake fine sandy loam, 3 to 8 percent | Glaciofluvial | Mixed Limestone & Crystalline | Loamy / Sand & Gravel | 1.7 | 2.90% |
| 39A | Groton gravelly sandy loam, 0 to 3 percent slopes | Glaciofluvial | Mixed Limestone & Crystalline Rocks | Sandy & Gravelly | 3.6 | 6.00% |
| 75E | Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes | Glacial Till | Schist, Granite & Gneiss | Loamy | 3 | 5.10% |
| 106 | Winooski silt loam | Alluvial | Mixed Crystalline | Silty | 5.2 | 8.70% |
| 107 | Limerick and Lim soils | Alluvial | Mixed Crystalline | Silty | 29.8 | 50.10% |
| 109 | Fluvaquents-Udifluents complex, frequently flooded | In flux deposits that range in drainage class | A mix of materials | Varies | 0.9 | 1.50% |
| 306 | Udorthents-Urban land complex | Manmade | A mix of materials | Varies | 0 | 0.00% |
| Totals for Area of Interest | | | | | 59.5 | 100.00% |

Appendix

Here are links to soils resources:

Connecticut Soils Publication

https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/connecticut/CT600/0/connecticut.pdf

Web Soil Survey

<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

Soil Catenas of Connecticut - 2014

https://www.nrcs.usda.gov/wps/PA_NRCSCConsumption/download?cid=nrcseprd399036&ext=pdf

Importance of Soil

<https://dese.mo.gov/sites/default/files/aged-Soils-Student-Ref..pdf>

NAVFAC Soil Mechanics DM7.01

https://web.mst.edu/~rogersda/umrcourses/ge441/dm7_01.pdf

NAVFAC Foundations and Earth Structures DM7.02

https://www.tugraz.at/fileadmin/user_upload/Institute/IAG/Files/24_NAVFAC_DM_7_02.pdf

Helping People Understand Soils – Ten Key Messages

<https://extension.illinois.edu/soil/sellsoil/sellsoil.pdf>

If you choose to use WSS use the following shp files for the AOI

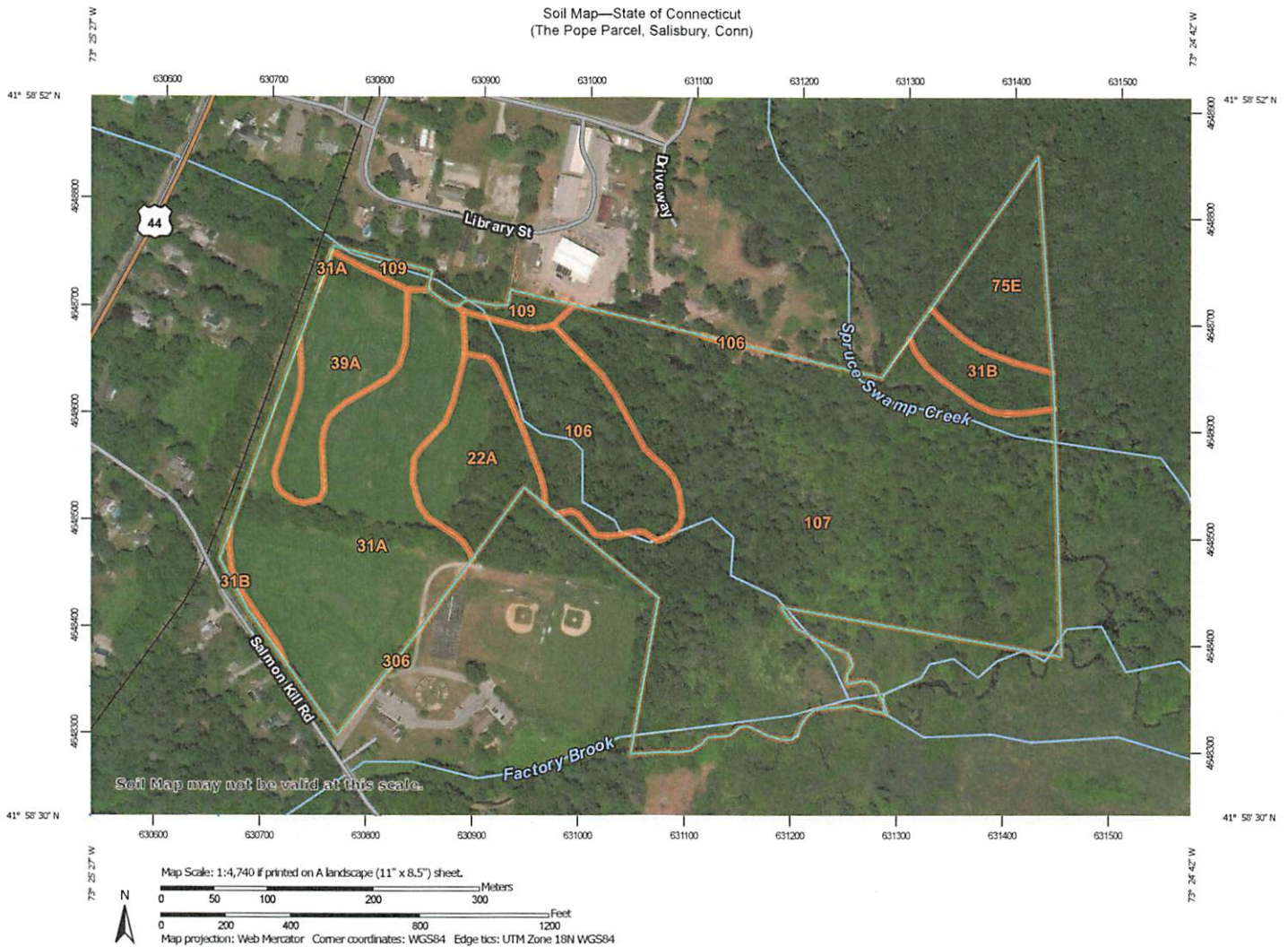
www.prhackett.com/PopeA2.shp

www.prhackett.com/PopeA2.shx

www.prhackett.com/PopeA2.prj

www.prhackett.com/PopeA2.dbf





































Soil Map—State of Connecticut
(The Pope Parcel, Salisbury, Conn.)



Soil Map may not be valid at this scale.

Soil Map—State of Connecticut
(The Pope Parcel, Salisbury, Conn)

MAP LEGEND

| | | |
|---|------------------------|---|
| Area of Interest (AOI) | |  Spoil Area |
|  | Area of Interest (AOI) |  Stony Spot |
| Soils | |  Very Stony Spot |
|  | Soil Map Unit Polygons |  Wet Spot |
|  | Soil Map Unit Lines |  Other |
|  | Soil Map Unit Points |  Special Line Features |
| Special Point Features | | Water Features |
|  | Blowout |  Streams and Canals |
|  | Borrow Pit | Transportation |
|  | Clay Spot |  Rails |
|  | Closed Depression |  Interstate Highways |
|  | Gravel Pit |  US Routes |
|  | Gravelly Spot |  Major Roads |
|  | Landfill |  Local Roads |
|  | Lava Flow | Background |
|  | Marsh or swamp |  Aerial Photography |
|  | Mine or Quarry | |
|  | Miscellaneous Water | |
|  | Perennial Water | |
|  | Rock Outcrop | |
|  | Saline Spot | |
|  | Sandy Spot | |
|  | Severely Eroded Spot | |
|  | Sinkhole | |
|  | Slide or Slip | |
|  | Sodic Spot | |

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.
Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 16, Sep 15, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

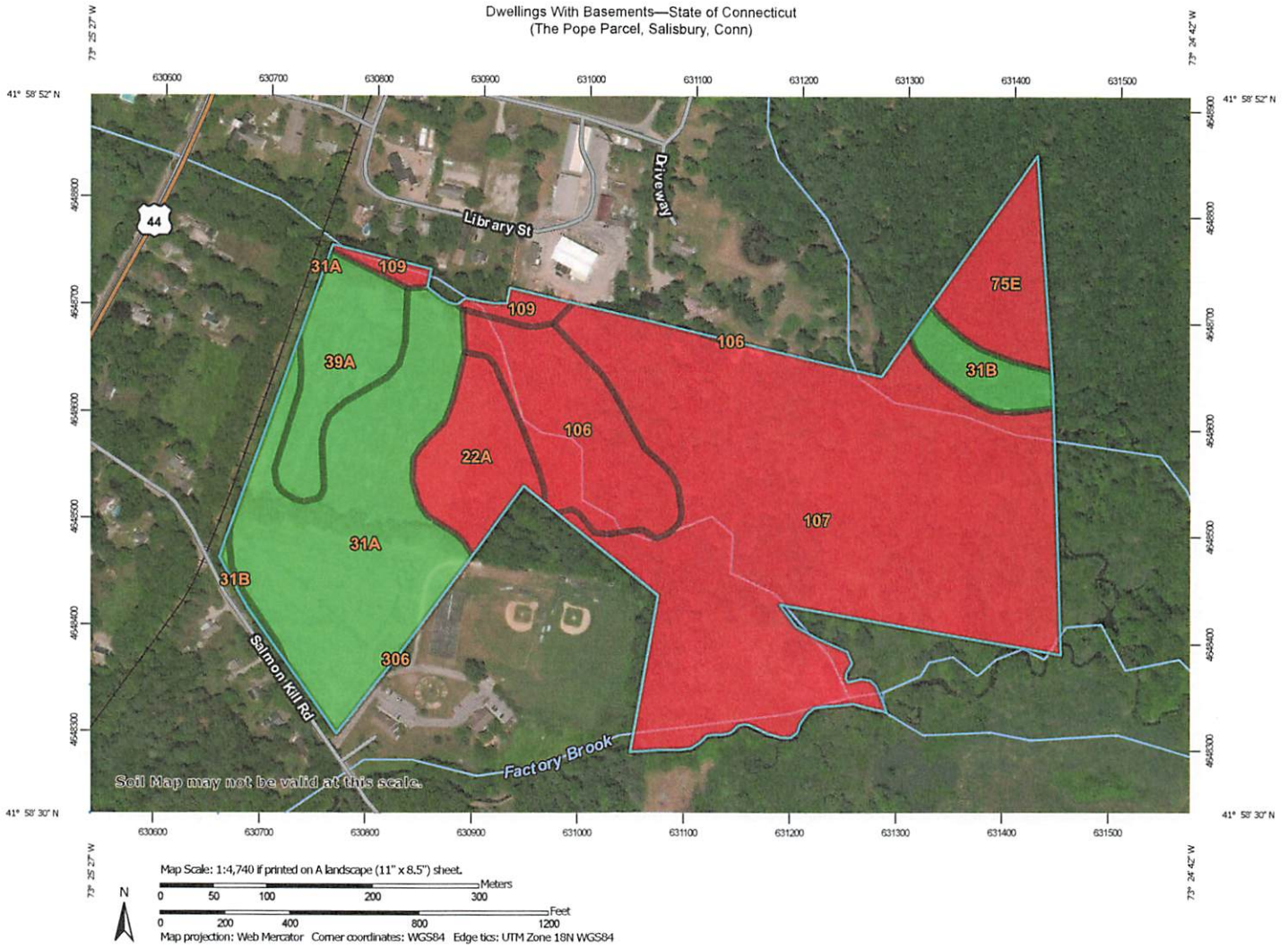
Date(s) aerial images were photographed: Jul 2, 2015—Oct 5, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend





















| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|------------------------------------|--|--------------|----------------|
| 22A | Hero gravelly loam, 0 to 3 percent slopes | 3.2 | 5.4% |
| 31A | Copake fine sandy loam, 0 to 3 percent slopes | 12.1 | 20.3% |
| 31B | Copake fine sandy loam, 3 to 8 percent slopes | 1.7 | 2.9% |
| 39A | Groton gravelly sandy loam, 0 to 3 percent slopes | 3.6 | 6.0% |
| 75E | Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes | 3.0 | 5.1% |
| 106 | Winooski silt loam | 5.2 | 8.7% |
| 107 | Limerick and Lim soils | 29.8 | 50.1% |
| 109 | Fluvaquents-Udifluvents complex, frequently flooded | 0.9 | 1.5% |
| 306 | Udorthents-Urban land complex | 0.0 | 0.0% |
| Totals for Area of Interest | | 59.5 | 100.0% |

Dwellings With Basements—State of Connecticut
(The Pope Parcel, Salisbury, Conn)



Dwellings With Basements—State of Connecticut
(The Pope Parcel, Salisbury, Conn)

MAP LEGEND

- | | |
|--|--|
| Area of Interest (AOI) | Background |
|  Area of Interest (AOI) |  Aerial Photography |
| Soils | |
| Soil Rating Polygons | |
|  Very limited | |
|  Somewhat limited | |
|  Not limited | |
|  Not rated or not available | |
| Soil Rating Lines | |
|  Very limited | |
|  Somewhat limited | |
|  Not limited | |
|  Not rated or not available | |
| Soil Rating Points | |
|  Very limited | |
|  Somewhat limited | |
|  Not limited | |
|  Not rated or not available | |
| Water Features | |
|  Streams and Canals | |
| Transportation | |
|  Rails | |
|  Interstate Highways | |
|  US Routes | |
|  Major Roads | |
|  Local Roads | |

MAP INFORMATION

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Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 16, Sep 15, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 2, 2015—Oct 5, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Dwellings With Basements

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|-----------------|--|--------------|--------------------------|--|--------------|----------------|
| 22A | Hero gravelly loam, 0 to 3 percent slopes | Very limited | Hero (85%) | Depth to saturated zone (1.00) | 3.2 | 5.4% |
| | | | Fredon (3%) | Depth to saturated zone (1.00) | | |
| | | | Halsey (2%) | Ponding (1.00) Depth to saturated zone (1.00) | | |
| 31A | Copake fine sandy loam, 0 to 3 percent slopes | Not limited | Copake (85%) | | 12.1 | 20.3% |
| | | | Groton (5%) | | | |
| 31B | Copake fine sandy loam, 3 to 8 percent slopes | Not limited | Copake (85%) | | 1.7 | 2.9% |
| 39A | Groton gravelly sandy loam, 0 to 3 percent slopes | Not limited | Groton (85%) | | 3.6 | 6.0% |
| | | | Copake (5%) | | | |
| 75E | Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes | Very limited | Hollis (35%) | Slope (1.00) | 3.0 | 5.1% |
| | | | | Depth to hard bedrock (1.00) | | |
| | | | Chatfield (30%) | Slope (1.00) | | |
| | | | | Depth to hard bedrock (1.00) | | |
| | | | Charlton (7%) | Slope (1.00) | | |
| | | | Sutton (5%) | Depth to saturated zone (1.00) | | |
| | | | | Slope (0.04) | | |
| Leicester (5%) | Depth to saturated zone (1.00) | | | | | |
| Brimfield (1%) | Slope (1.00) | | | | | |
| | Depth to hard bedrock (1.00) | | | | | |
| 106 | Winooski silt loam | Very limited | Winooski (80%) | Flooding (1.00) | 5.2 | 8.7% |
| | | | | Depth to saturated zone (1.00) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|-----------------|------------------------|--------------|--------------------------|---------------------------------|--------------|----------------|
| | | | Hadley (5%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (0.03) | | |
| | | | Bash (3%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | Lim (3%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | Limerick (3%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | Saco (2%) | Ponding (1.00) | | |
| | | | | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| 107 | Limerick and Lim soils | Very limited | Limerick (50%) | Flooding (1.00) | 29.8 | 50.1% |
| | | | | Depth to saturated zone (1.00) | | |
| | | | Lim (30%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | Saco (8%) | Ponding (1.00) | | |
| | | | | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | Rippowam (5%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | Winooski (3%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | Hadley (2%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (0.03) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|------------------------------------|--|--------------|---------------------------------------|---|--------------|----------------|
| | | | Bash (2%) | Flooding (1.00) Depth to saturated zone (1.00) | | |
| 109 | Fluvaquents-Udifuvents complex, frequently flooded | Very limited | Fluvaquents, Frequently Flooded (50%) | Flooding (1.00) Depth to saturated zone (1.00) | 0.9 | 1.5% |
| | | | Udifuvents, Frequently Flooded (35%) | Flooding (1.00) | | |
| | | | Saco (3%) | Ponding (1.00) | | |
| | | | | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | Rippowam (3%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | Pootatuck (2%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | Occum (2%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (0.09) | | |
| 306 | Udorthents-Urban land complex | Very limited | Udorthents (50%) | Slope (1.00) Depth to saturated zone (0.18) | 0.0 | 0.0% |
| Totals for Area of Interest | | | | | 59.5 | 100.0% |

| Rating | Acres in AOI | Percent of AOI |
|------------------------------------|--------------|----------------|
| Very limited | 42.1 | 70.8% |
| Not limited | 17.3 | 29.2% |
| Totals for Area of Interest | 59.5 | 100.0% |

Description

Dwellings are single-family houses of three stories or less. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet.

The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification of the soil. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

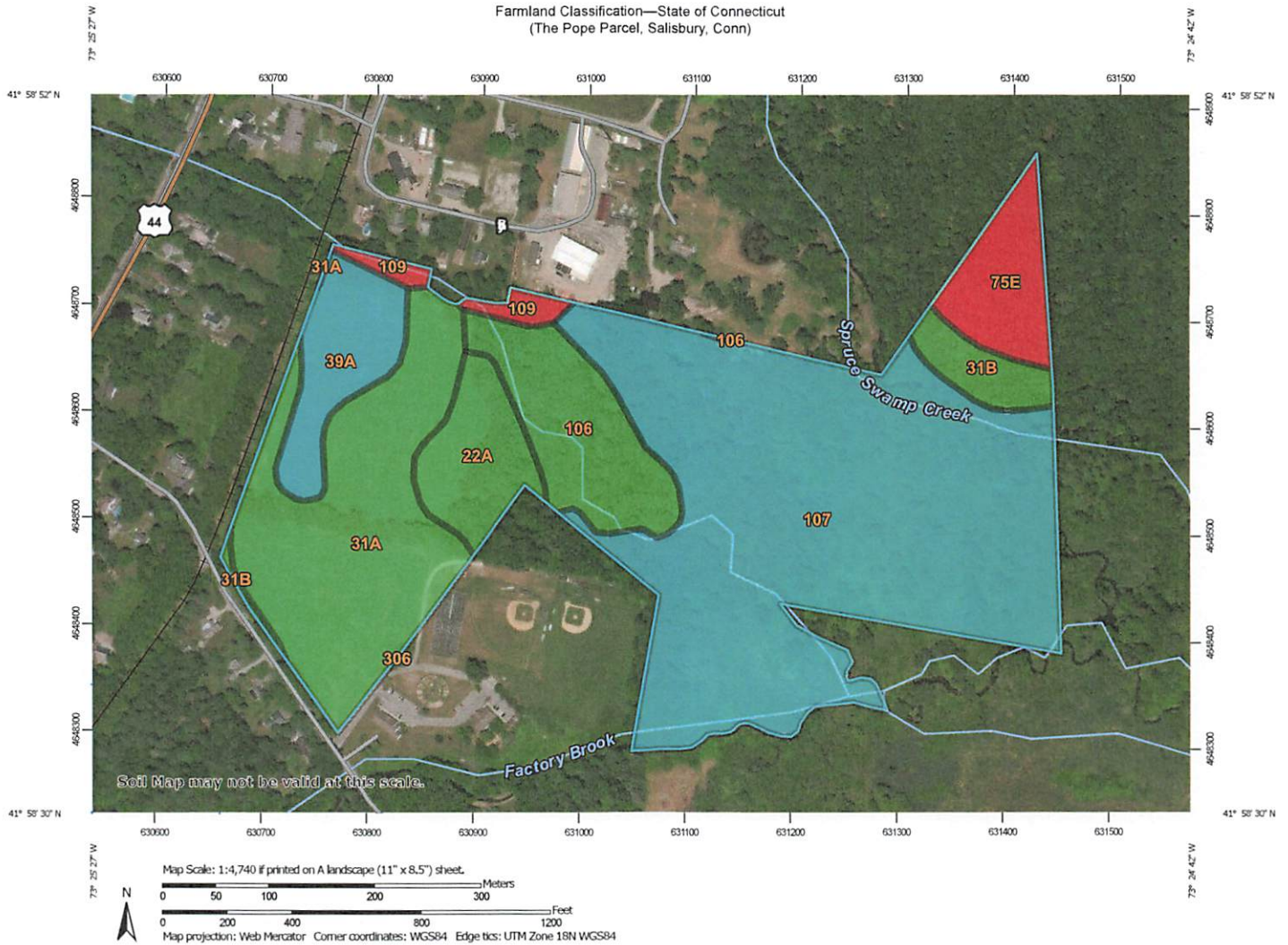
Rating Options

Aggregation Method: Dominant Condition

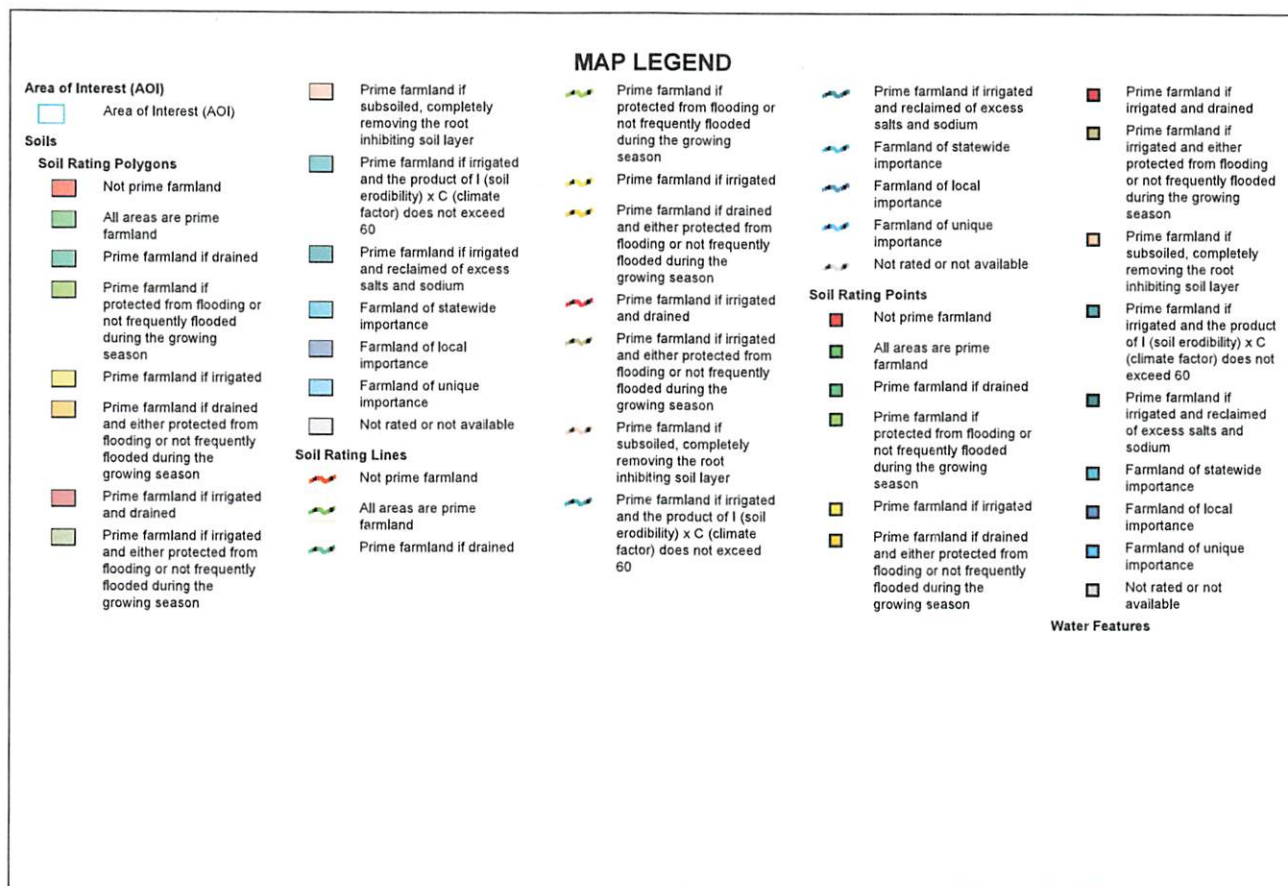
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Farmland Classification—State of Connecticut
(The Pope Parcel, Salisbury, Conn)



Farmland Classification—State of Connecticut
(The Pope Parcel, Salisbury, Conn)



Farmland Classification—State of Connecticut
(The Pope Parcel, Salisbury, Conn)

MAP INFORMATION

-  Streams and Canals
- Transportation**
-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads
- Background**
-  Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: State of Connecticut
Survey Area Data: Version 16, Sep 15, 2017

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Date(s) aerial images were photographed: Jul 2, 2015—Oct 5, 2016

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Farmland Classification

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|------------------------------------|--|----------------------------------|--------------|----------------|
| 22A | Hero gravelly loam, 0 to 3 percent slopes | All areas are prime farmland | 3.2 | 5.4% |
| 31A | Copake fine sandy loam, 0 to 3 percent slopes | All areas are prime farmland | 12.1 | 20.3% |
| 31B | Copake fine sandy loam, 3 to 8 percent slopes | All areas are prime farmland | 1.7 | 2.9% |
| 39A | Groton gravelly sandy loam, 0 to 3 percent slopes | Farmland of statewide importance | 3.6 | 6.0% |
| 75E | Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes | Not prime farmland | 3.0 | 5.1% |
| 106 | Winooski silt loam | All areas are prime farmland | 5.2 | 8.7% |
| 107 | Limerick and Lim soils | Farmland of statewide importance | 29.8 | 50.1% |
| 109 | Fluvaquents-Udifluvents complex, frequently flooded | Not prime farmland | 0.9 | 1.5% |
| 306 | Udorhents-Urban land complex | Not prime farmland | 0.0 | 0.0% |
| Totals for Area of Interest | | | 59.5 | 100.0% |

Description

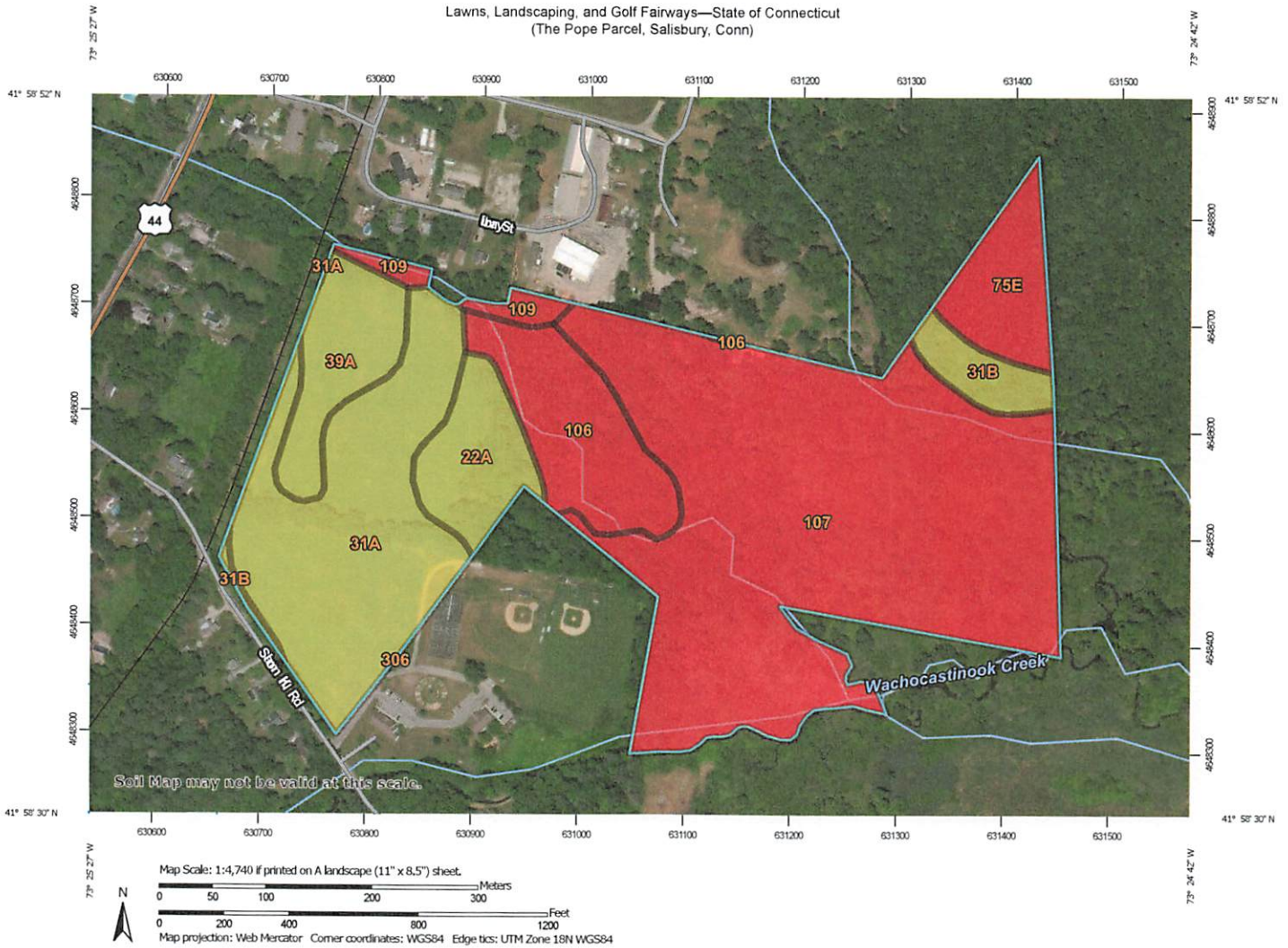
Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary



















Tie-break Rule: Lower

Lawns, Landscaping, and Golf Fairways—State of Connecticut
(The Pope Parcel, Salisbury, Conn)



Lawns, Landscaping, and Golf Fairways—State of Connecticut
(The Pope Parcel, Salisbury, Conn)

MAP LEGEND

- | | |
|--|--|
| Area of Interest (AOI) | Background |
|  Area of Interest (AOI) |  Aerial Photography |
| Soils | |
| Soil Rating Polygons | |
|  Very limited | |
|  Somewhat limited | |
|  Not limited | |
|  Not rated or not available | |
| Soil Rating Lines | |
|  Very limited | |
|  Somewhat limited | |
|  Not limited | |
|  Not rated or not available | |
| Soil Rating Points | |
|  Very limited | |
|  Somewhat limited | |
|  Not limited | |
|  Not rated or not available | |
| Water Features | |
|  Streams and Canals | |
| Transportation | |
|  Rails | |
|  Interstate Highways | |
|  US Routes | |
|  Major Roads | |
|  Local Roads | |

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Lawns, Landscaping, and Golf Fairways

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|-----------------|---|------------------|--------------------------|---------------------------------|--------------|----------------|
| 22A | Hero gravelly loam, 0 to 3 percent slopes | Somewhat limited | Hero (85%) | Low exchange capacity (0.75) | 3.2 | 5.4% |
| | | | | Depth to saturated zone (0.19) | | |
| | | | | Gravel content (0.18) | | |
| | | | | Large stones content (0.01) | | |
| | | | | Dusty (0.01) | | |
| | | | Groton (5%) | Droughty (0.99) | | |
| | | | | Low exchange capacity (0.75) | | |
| | | | | Gravel content (0.60) | | |
| | | | Copake (5%) | Dusty (0.00) | | |
| | | | | Low exchange capacity (0.75) | | |
| 31A | Copake fine sandy loam, 0 to 3 percent slopes | Somewhat limited | Copake (85%) | Low exchange capacity (0.75) | 12.1 | 20.3% |
| | | | | Dusty (0.00) | | |
| | | | Groton (5%) | Droughty (0.99) | | |
| | | | | Low exchange capacity (0.75) | | |
| | | | | Gravel content (0.60) | | |
| | | | | Dusty (0.00) | | |
| | | | Hero (5%) | Low exchange capacity (0.75) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | | Gravel content (0.18) | | |
| | | | | Large stones content (0.01) | | |
| Dusty (0.01) | | | | | | |
| 31B | Copake fine sandy loam, 3 | Somewhat limited | Copake (85%) | Low exchange capacity (0.75) | 1.7 | 2.9% |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|-----------------|--|------------------|--------------------------|---------------------------------|--------------|----------------|
| | to 8 percent slopes | | | Dusty (0.00) | | |
| | | | Groton (5%) | Droughty (0.99) | | |
| | | | | Low exchange capacity (0.75) | | |
| | | | | Gravel content (0.60) | | |
| | | | | Slope (0.04) | | |
| | | | | Dusty (0.00) | | |
| | | | Hero (5%) | Low exchange capacity (0.75) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | | Gravel content (0.18) | | |
| | | | | Large stones content (0.01) | | |
| | | | | Dusty (0.01) | | |
| 39A | Groton gravelly sandy loam, 0 to 3 percent slopes | Somewhat limited | Groton (85%) | Droughty (0.99) | 3.6 | 6.0% |
| | | | | Low exchange capacity (0.75) | | |
| | | | | Gravel content (0.60) | | |
| | | | | Dusty (0.00) | | |
| | | | Copake (5%) | Low exchange capacity (0.75) | | |
| | | | | Dusty (0.00) | | |
| | | | Hero (5%) | Low exchange capacity (0.75) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | | Gravel content (0.18) | | |
| | | | | Large stones content (0.01) | | |
| | | | | Dusty (0.01) | | |
| 75E | Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes | Very limited | Hollis (35%) | Depth to bedrock (1.00) | 3.0 | 5.1% |
| | | | | Slope (1.00) | | |
| | | | | Droughty (1.00) | | |
| | | | | Gravel content (0.22) | | |
| | | | | Dusty (0.00) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|-----------------|--------------------|--------------|--------------------------|---------------------------------|--------------|----------------|
| | | | Chatfield (30%) | Slope (1.00) | | |
| | | | | Depth to bedrock (0.54) | | |
| | | | | Gravel content (0.26) | | |
| | | | | Droughty (0.22) | | |
| | | | | Dusty (0.00) | | |
| | | | Charlton (7%) | Slope (1.00) | | |
| | | | | Low exchange capacity (1.00) | | |
| | | | | Dusty (0.00) | | |
| | | | Sutton (5%) | Low exchange capacity (1.00) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | | Slope (0.04) | | |
| | | | | Dusty (0.00) | | |
| | | | Leicester (5%) | Depth to saturated zone (1.00) | | |
| | | | | Dusty (0.00) | | |
| | | | Brimfield (1%) | Depth to bedrock (1.00) | | |
| | | | | Slope (1.00) | | |
| | | | | Droughty (0.98) | | |
| | | | | Dusty (0.00) | | |
| 106 | Winooski silt loam | Very limited | Winooski (80%) | Flooding (1.00) | 5.2 | 8.7% |
| | | | | Low exchange capacity (0.75) | | |
| | | | | Depth to saturated zone (0.04) | | |
| | | | | Dusty (0.02) | | |
| | | | Bash (3%) | Flooding (1.00) | | |
| | | | | Low exchange capacity (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Dusty (0.02) | | |
| | | | Lim (3%) | Flooding (1.00) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|-----------------|------------------------|--------------|--------------------------|---------------------------------|--------------|----------------|
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Low exchange capacity (0.75) | | |
| | | | | Dusty (0.01) | | |
| | | | Limerick (3%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Low exchange capacity (1.00) | | |
| | | | | Dusty (0.02) | | |
| | | | Saco (2%) | Ponding (1.00) | | |
| | | | | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Low exchange capacity (0.75) | | |
| | | | | Dusty (0.02) | | |
| 107 | Limerick and Lim soils | Very limited | Limerick (50%) | Flooding (1.00) | 29.8 | 50.1% |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Low exchange capacity (1.00) | | |
| | | | | Dusty (0.02) | | |
| | | | Lim (30%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Low exchange capacity (0.75) | | |
| | | | | Dusty (0.01) | | |
| | | | Saco (8%) | Ponding (1.00) | | |
| | | | | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Low exchange capacity (0.75) | | |
| | | | | Dusty (0.02) | | |
| | | | Rippowam (5%) | Flooding (1.00) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|-----------------|---|--------------|---------------------------------------|---------------------------------|--------------|----------------|
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Low exchange capacity (1.00) | | |
| | | | | Dusty (0.00) | | |
| | | | Winooski (3%) | Flooding (1.00) | | |
| | | | | Low exchange capacity (0.75) | | |
| | | | | Depth to saturated zone (0.04) | | |
| | | | | Dusty (0.02) | | |
| | | | Bash (2%) | Flooding (1.00) | | |
| | | | | Low exchange capacity (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Dusty (0.02) | | |
| 109 | Fluvaquents-Udifuluents complex, frequently flooded | Very limited | Fluvaquents, Frequently Flooded (50%) | Flooding (1.00) | 0.9 | 1.5% |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Low exchange capacity (0.50) | | |
| | | | Udifuluents, Frequently Flooded (35%) | Flooding (1.00) | | |
| | | | | Low exchange capacity (0.50) | | |
| | | | | Droughty (0.08) | | |
| | | | | Dusty (0.00) | | |
| | | | Saco (3%) | Ponding (1.00) | | |
| | | | | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Low exchange capacity (0.75) | | |
| | | | | Dusty (0.02) | | |
| | | | Rippowam (3%) | Flooding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Low exchange capacity (1.00) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|------------------------------------|-------------------------------|--------------|--------------------------|---------------------------------|--------------|----------------|
| | | | | Dusty (0.00) | | |
| | | | Pootatuck (2%) | Flooding (1.00) | | |
| | | | | Low exchange capacity (1.00) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | | Dusty (0.00) | | |
| 306 | Udorthents-Urban land complex | Very limited | Udorthents (50%) | Slope (1.00) | 0.0 | 0.0% |
| | | | | Low exchange capacity (0.50) | | |
| | | | | Dusty (0.01) | | |
| Totals for Area of Interest | | | | | 59.5 | 100.0% |

| Rating | Acres in AOI | Percent of AOI |
|------------------------------------|--------------|----------------|
| Very limited | 38.9 | 65.4% |
| Somewhat limited | 20.6 | 34.6% |
| Totals for Area of Interest | 59.5 | 100.0% |

Description

This interpretation rates soils for their use in establishing and maintaining turf for lawns and golf fairways and ornamental trees and shrubs for residential or commercial landscaping. Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required.

The ratings are based on the use of soil material at the site, which may have been altered by some land smoothing. Irrigation may or may not be needed and is not a criterion in rating. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. Soils that are subject to flooding are limited by the duration and intensity of flooding and the season when flooding occurs. In planning for lawns, landscaping, or golf fairways, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit

are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

SOIL SCIENCE AND ENVIRONMENTAL SERVICES, INC.

95 Silo Drive * Rocky Hill * Connecticut * 06067 * (203) 272-7837 * ssesinc@yahoo.com

WETLANDS/WATERCOURSES AND SOIL REPORT

Lamb Kiefer Land Surveyors

SSES Job No: 2019-42-CT-SAL

55 Selleck Hill Road

Client Job No:

Salisbury, CT 06068

Site Inspection Date: May 2 & 7, 2019

PROJECT TITLE AND LOCATION: Area of concern at Pope Property, Salmon Kill Road,
Salisbury, CT +/- 30 Acres

IDENTIFICATION OF WETLANDS AND WATERCOURSES RESOURCES

WETLANDS AND WATERCOURSES PRESENT ON PROPERTY: Yes XX No

Wetlands: Inland Wetlands XX Watercourses: Streams XX

Tidal Wetlands Waterbodies

Remarks:

VEGETATION COMMUNITIES PRESENT IN WETLANDS

Forest XX Sapling/Shrub XX Wet Meadow Marsh Field/Lawn XX

SOIL MOISTURE CONDITION

Dry

Moist XX

Wet

WINTER CONDITIONS

Frost Depth: inches

Snow Depth: inches

The classification system of the National Cooperative Soil Survey, USDA, Natural Resources Conservation Service and the State Soil Legend were used in this investigation. The investigation was conducted by the undersigned Registered Soil Scientist. A sketch map showing wetland boundaries and the numbering sequence of wetland markers, watercourses and soil types in both wetland and non-wetlands are included with this report. After the wetland boundary and/or watercourse flags have been located/plotted by the surveyor, it is recommended that a copy of the survey map be sent to our firm for review. All wetland boundary lines established by the undersigned Registered Soil Scientist are subject to change until officially adopted by local, state or federal regulatory agencies.

Respectfully Submitted by

SOIL SCIENCE AND ENVIRONMENTAL SERVICES, INC.

Scott D. Stevens

Scott D. Stevens
Registered Professional Soil Scientist

See attached pages

SOIL SCIENCE AND ENVIRONMENTAL SERVICES, INC.

95 Silo Drive * Rocky Hill * Connecticut * 06067 * (203) 272-7837 * ssesinc@yahoo.com

WETLANDS/WATERCOURSES AND SOIL REPORT

PROJECT TITLE AND LOCATION: Area of concern at Pope Property, Salmon Kill Road,
Salisbury, CT +/- 30 Acres

NUMBERING SEQUENCE OF WETLAND BOUNDARY LINE MARKERS:

WF#1 thru 59

Plot and locate watercourses as shown on sketch map.

SOILS SECTION:

Soil Legend: State Soil Number/County Soil Symbol, Soil Series Name, Taxonomic Class & Brief Description.

WETLAND SOILS

14 Fredon silt loam (Aeric Endoaquepts) - This is a deep, somewhat poorly to poorly drained, friable, loamy textured soil that developed over sandy and gravelly, glacial outwash. The soil materials were derived from schist, limestone and dolomite. Outwash soils occur in valleys, outwash plains and terraces.

106 Winooski silt loam (Aquic Udifluvents) - This is a deep, moderately well drained, friable, silty soil that formed in alluvial sediments. Winooski soils occur in nearly level floodplains and along river and streams which are subject to frequent flooding.

107 Limerick and Lim soils (Aeric & Typic Fluvaquents) - These are deep, poorly drained, friable, silty and coarse-loamy soils that formed in alluvial sediments derived from schist, gneiss and granite. Limerick and Lim soils occur in nearly level floodplains and along rivers and streams which are subject to frequent flooding.

109 Fluvaquents-Udfluvents This soil map unit consists of well drained to very poorly drained, nearly level soils that formed in very recent alluvium deposited by rivers and streams. The soils are occasionally to frequently flooded, which often results in stream scouring, lateral erosion and shifting of soil from place to place. Soil characteristics, such as texture and stoniness, are usually highly variable within short distances.

NON-WETLAND SOILS

22 Hero gravelly loam (Aquic Eutrudepts) - This is a deep, moderately well drained, friable, coarse-loamy textured soil developed over sandy and gravelly, glacial outwash derived from schist, limestone and dolomite. Outwash soils occur in valleys, outwash plains and terraces.

31 Copake fine sandy loam (Dystric Eutrudepts) - This is a deep, well drained, friable, coarse-loamy textured soil that developed over sandy and gravelly, glacial outwash derived from schist, limestone and dolomite. Outwash soils occur in valleys, outwash plains and terraces.

39 Groton gravelly sandy loam (Typic Eutrudepts) - This is a deep, excessively drained, gravelly sandy textured soil that developed over sandy and gravelly, glacial outwash derived from schist, limestone and dolomite. Groton soils occur in valleys, outwash plains, terraces, kames and eskers landforms.

306 Udorthents-Urban land complex This map unit consists of extensive areas where soils have been disturbed from land development along with large areas of impervious surfaces associated with streets, parking lots, buildings and other structures.

308 Udorthents, smoothed This is a well drained to moderately well drained soil area that has had two or more feet of the original soil surface altered by filling, excavation or grading activities. Udorthents, smoothed soils commonly occur on leveled land and fill landforms.

SOIL SCIENCE AND ENVIRONMENTAL SERVICES, INC.

95 Silo Drive * Rocky Hill * Connecticut * 06067 * (203) 272-7837 * ssesinc@yahoo.com

WETLANDS/WATERCOURSES AND SOIL REPORT

PROJECT TITLE AND LOCATION: Area of concern at Pope Property, Salmon Kill Road,
Salisbury, CT +/- 30 Acres

NUMBERING SEQUENCE OF WETLAND BOUNDARY LINE MARKERS:

WF#1 thru 59

Plot and locate watercourses as shown on sketch map.

SOILS SECTION:

Soil Legend: State Soil Number/County Soil Symbol, Soil Series Name, Taxonomic Class & Brief Description.

On May 7, 2019, SS&ES, Inc. observed the subsurface soils within eight deep test pits dug on-site to help determine the drainage classification of the soils that exist on the property. (Note: Many of the holes that were previously dug with a spade & hand auger revealed coarse sand and gravel within 2-3 feet of the soil surface.) Eight deep test holes were dug with a backhoe provided by the town. The approximate locations of each test pit are shown on the sketch map as TP1-TP8. The total excavation depth of each pit and approximate depth to water are listed below:

TP1 - 28" to water. TP1 was dug near the eastern baseball field by wetland flag WF#59

TP2 - No water to 72" below grade

TP3 - No water to 63" below grade

TP4 - No water to 72" below grade

TP5 - No water to 69" below grade

TP6 - No water to 60" below grade

TP7 - No water to 74" below grade

TP8 - No water to 82" below grade

**DEFINITIONS AND METHODOLOGY FOR IDENTIFICATION OF
STATE REGULATED WETLANDS & WATERCOURSES**

Wetlands and watercourses are regulated in the State of Connecticut by the Connecticut General Statutes, Chapter 440, sections 22a-28 to 22a-45. The Statutes are divided into the Inland Wetlands and Watercourses Act (sections 22a-36 to 22a-45) and the Tidal Wetlands Act (sections 22a-28 to 22a-35).

Inland Wetlands "means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture" section 22a-38(15).

Watercourses "means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private which are contained within, flow through or border upon this state or any portion thereof, not regulated pursuant to sections 22a-28 to 22a-35, inclusive. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation" section.22a-38(16).

Tidal Wetlands are defined as "those areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marsh, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water; and upon which may grow or be capable of growing some, but not necessarily all of the following:" (includes plant list) section 22a-29(2).

METHODOLOGY FOR IDENTIFICATION OF SOILS, WETLANDS & WATERCOURSES

1) **SOILS IDENTIFICATION**: Soils are investigated by digging test holes with a spade and auger. Test holes are typically dug to depths of between 15 and 40 inches. Based on soil features, including coloration patterns, texture and depths to restrictive layers, the soils are identified by soil series name utilizing the classification system of the National Cooperative Soil Survey. Soil series map numbers correspond with the State Soil Map Legend established by USDA, NRCS in the State of Connecticut Soil Survey. For further soils information, refer to the NRCS website for CT: www.ct.nrcs.usda.gov

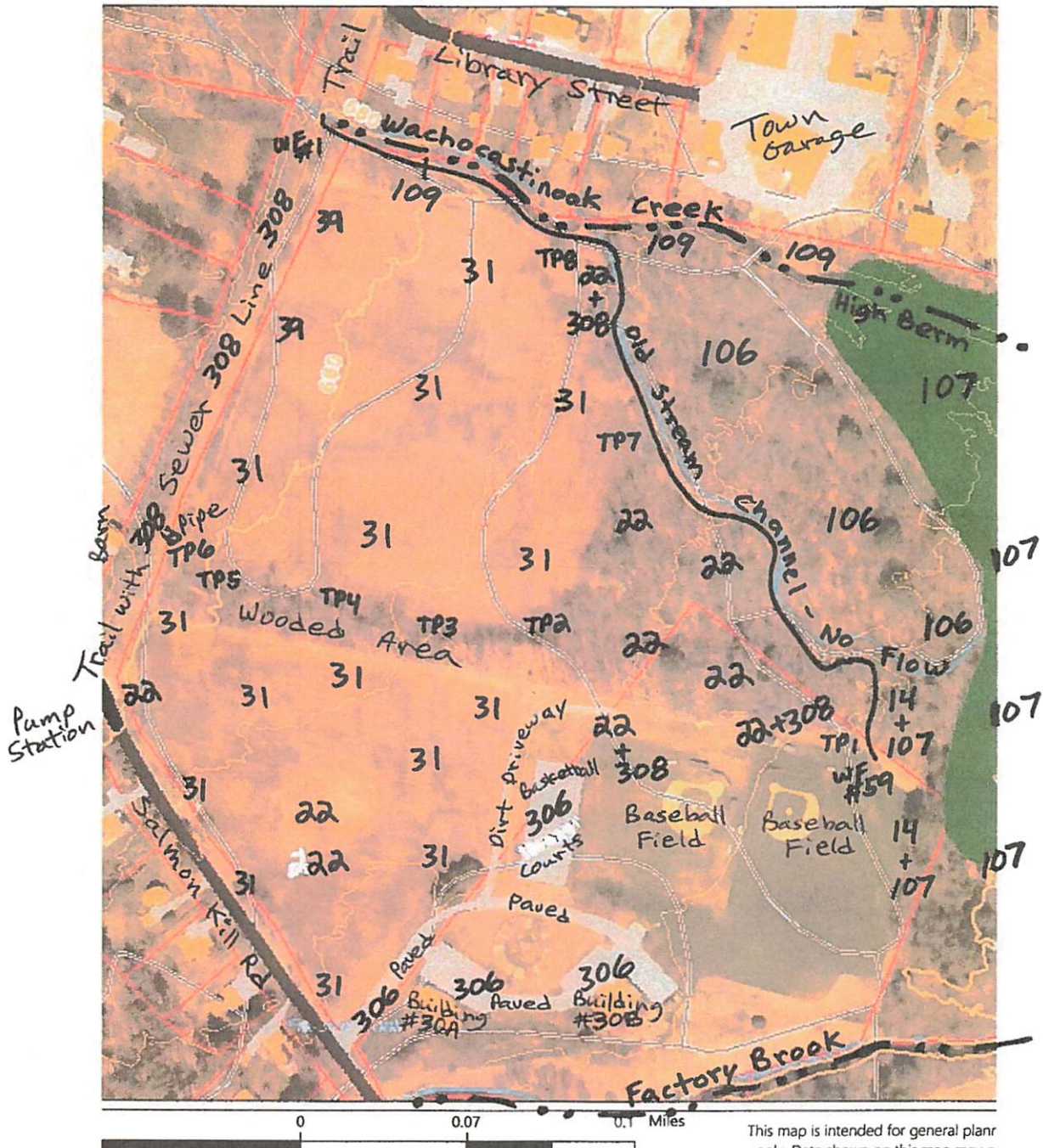
2) **INLAND WETLAND DELINEATION**: Soil test holes and borings are made in selected areas in order to determine the lateral extent of Inland Wetlands. The boundaries of the Inland Wetlands are identified in the field and delineated with consecutively numbered survey tapes, unless instructed by the client to only map wetland boundaries for planning purposes. The approximate locations of the wetland boundaries are hand drawn onto a map and are included with the wetlands report.

3) **IDENTIFICATION OF WATERCOURSES**: Very often the locations of ponds, streams and rivers are already shown on a survey map. If a watercourse is absent from a survey map, then survey tapes, labeled "watercourse" or "intermittent watercourse" are placed along the channel and the approximate location of the watercourse is also sketched onto the map.

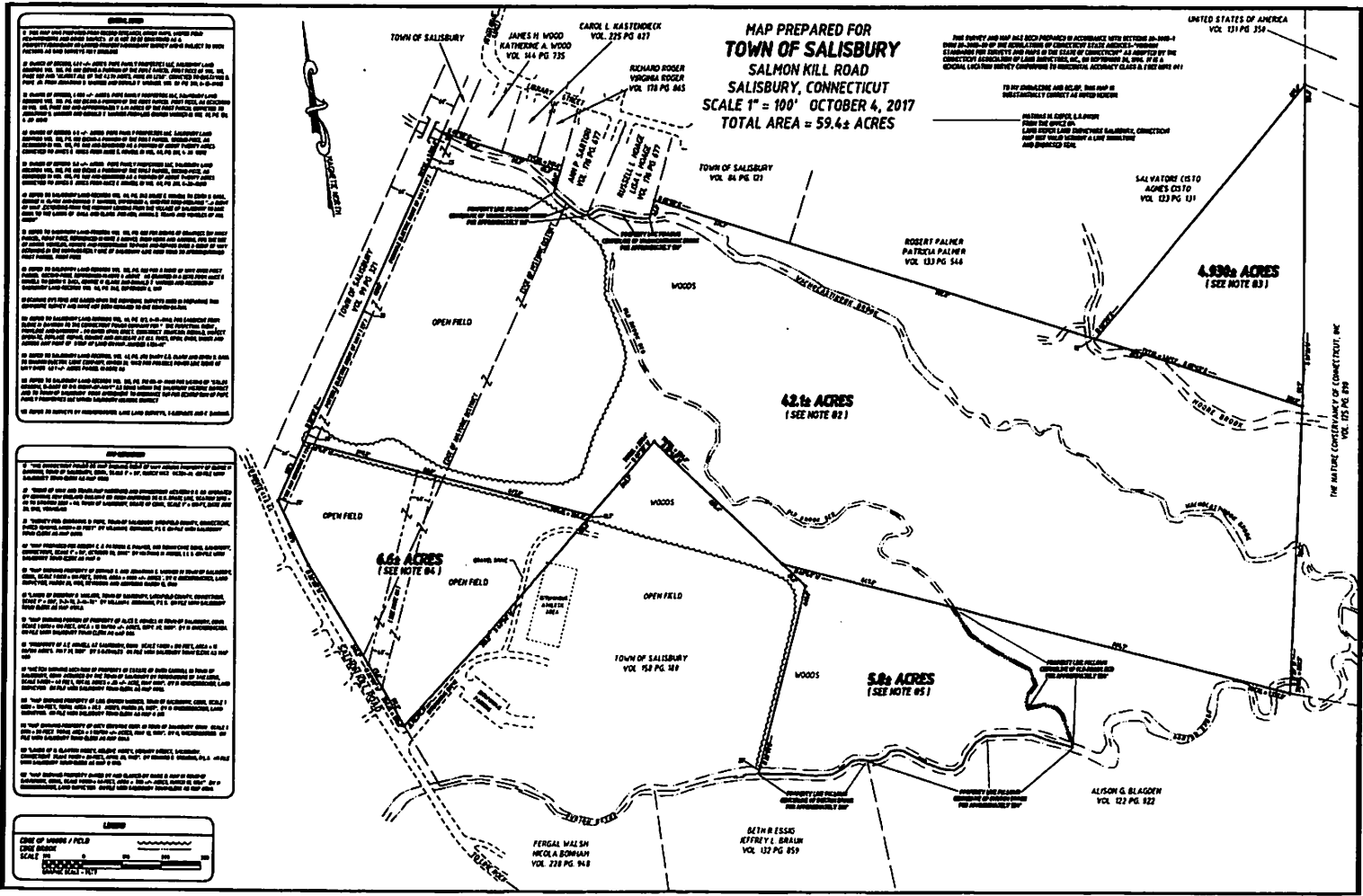
4) **TIDAL WETLANDS DELINEATION**: Tidal Wetlands are identified based on a predominance of tidal wetland plants and observation of physical markings or water laid deposits resulting from tidal action. Tidal Wetland boundaries are delineated by locating the upland limits of those plants listed in section 22a-29(2) to the extent that these plants reflect inundation by tides.

M Aplana

Environmental
Conditions Online



This map is intended for general planning only. Data shown on this map may have been compiled at different times.



NOTES

1. THIS MAP AND THE INFORMATION CONTAINED HEREIN WERE PREPARED BY THE SURVEYOR AND HIS ASSISTANTS IN ACCORDANCE WITH SECTION 36-200-1 OF THE CONSTITUTION OF THE STATE OF CONNECTICUT AND THE STATUTES THEREUNDER AND THE RULES AND REGULATIONS OF THE BOARD OF SURVEYORS AND MAPS OF THE STATE OF CONNECTICUT AS AMENDED BY THE BOARD OF SURVEYORS AND MAPS OF THE STATE OF CONNECTICUT. THE SURVEYOR HAS CONDUCTED A VISUAL INSPECTION OF THE LANDS SHOWN ON THIS MAP AND HAS FOUND THAT THE INFORMATION CONTAINED HEREIN IS CORRECT AND ACCURATE TO THE BEST OF HIS KNOWLEDGE AND BELIEF. THIS MAP IS SUBMITTED TO YOU AS A PUBLIC DOCUMENT AND IS NOT TO BE USED FOR ANY OTHER PURPOSE.

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LEGEND

LINE OF WOODS / FIELD

SCALE

0 50 100 150 200 FEET

DATE: OCT 4, 2017

LEGEND

LINE OF WOODS / FIELD

SCALE

0 50 100 150 200 FEET

DATE: OCT 4, 2017

UNITED STATES OF AMERICA VOL. 131 PG. 354

THE MATTHEW COMPTON LAW FIRM, P.C. VOL. 135 PG. 299

May 31, 2019

ATTN: Mathias Kiefer
Lamb Kiefer Land Surveyors LLC
55 Selleck Hill Road
Salisbury, CT 06068

**RE: CT DEEP NDDDB Listed Species Habitat Review
Pope Property (+/- 32 acre Area of Concern), Salmon Kill Road,
Salisbury, CT**

Dear Mr. Kiefer:

In accordance with your request, Jennifer Beno, Biologist/Wetland Scientist, with Soil Science and Environmental Services, Inc. (SSES) inspected the above-referenced project area on May 7, 2019. The purpose of the inspection was to observe the existing vegetation communities (habitat or cover type areas) on the "area of concern." The area of concern consists of approximately 32 acres of land owned by the Town of Salisbury. The Town of Salisbury contacted the CT Department of Energy and Environmental Protection (DEEP) Natural Diversity Data Base (NDDDB) division in order to determine if any Federal or State listed Endangered, Threatened, and Special Concern Species were known to exist on or near the area of concern. The CT DEEP NDDDB prepared a letter dated January 31, 2019 stating that six (6) listed plant species and three (3) listed vertebrate animal species were known to exist on or near the area of concern. Some of the plant species included on the list could not be identified or observed during the non-flowering time of the year. Therefore, SSES inspected the property to observe if appropriate habitat for the listed species occurs on the area of concern. Depending on the proposed future land use of the area of concern, additional inspections may be necessary during the appropriate season to identify certain species within the appropriate habitat areas.

General Site Description

The area of concern is an approximate 32 acre portion of land currently owned by the Town of Salisbury off of Salmon Kill Road. Generally, the area of concern is bordered by Wachocastinook Creek and residential houses off of Library Street to the north, by a large watercourse and wetland system to the east, by ball fields, a storage shed, the Salisbury Visiting Nurse Association, the Housatonic Day Care facilities, and Salmon Kill Road to the south, and by the railroad ramble walking trail and residential houses off of Main Street to the west.

During the inspection, I observed five (5) habitat areas, or cover types, on the ± 32 acre area of concern. The observed cover types include: 1) hay fields, 2) edge habitat, 3) wooded upland,

4) wooded floodplain wetland, and 5) Wachocastinook Creek, a perennial watercourse. See included map for cover type locations.



Cover types

- 1 – Hay Field
- 2 – Edge Habitat
- 3 – Wooded Upland
- 4 – Wooded Floodplain Wetland
- 5 – Wachocastinook Creek

1 – Hay Field

Cover Type 1 consists of hay fields. There are two hay fields in the western portion of the project area. These areas reportedly are cut for hay by a local farmer. The dominant vegetation associated with this cover type includes grasses, white clover (*Trifolium repens*), red clover (*Trifolium pratense*), fragrant bedstraw (*Galium triflorum*), dandelion (*Taraxacum officinale*), Queen Anne's lace (*Daucus carota*), violet (*Viola sp.*), bluets (*Houstonia caerulea*), common mullein (*Verbascum thapsus*), and English plantain (*Plantago lanceolata*). Wildlife observed associated with Cover Type 1 during the inspection include blue bird, bumble bee, and crow.



1 – Hay field (5/7/19).

2 – Edge Habitat

Cover Type 2 includes the transitional habitat, or edge, between the hay fields and the wooded upland and floodplain wetland areas. The edge habitat provides dense tree and shrub growth along the boundary with the hay fields which provides cover for different wildlife species. The dominant vegetation observed within the edge habitat during the inspection includes red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), black cherry (*Prunus serotina*), red oak (*Quercus rubra*), black birch (*Betula lenta*), elm (*Ulmus rubra*), silver maple (*Acer saccharinum*), sycamore (*Platanus occidentalis*), ash (*Fraxinus sp.*), Japanese barberry (*Berberis thunbergii*), silky dogwood (*Cornus amomum*), shrub honeysuckle (*Lonicera tatarica*), privet (*Ligustrum sp.*), multiflora rose (*Rosa multiflora*), raspberry (*Rubus idaeus*), burning bush (*Euonymus alatus*), sedges (*Carex sp.*), sensitive fern (*Onoclea sensibilis*), goldenrod (*Solidago sp.*), dandelion (*Taraxacum officinale*), garlic mustard (*Alliaria petiolata*), trillium (*Trillium erectum*), stinging nettle (*Urtica dioica*), Canada mayflower (*Maianthemum canadense*), daffodil (*Narcissus pseudonarcissus*), grasses, poison ivy (*Toxicodendron radicans*), bittersweet (*Celastrus orbiculatus*), and grape (*Vitis labrusca*). Wildlife observed during the inspection and associated with Cover Type 2 include titmouse, phoebe, crow, cardinal, catbird, goldfinch, bluejay, flicker, catbird, house wren, bluebird, robin, chipmunk, and tree frog. Old bird boxes were observed along the edge of the field.



2 – Edge habitat (5/7/19).

3 – Wooded Upland

Cover Type 3 includes a small wooded upland area. This small area of wooded upland is situated north of an existing ball field on land also owned by the Town of Salisbury. The wooded upland provides dense tree canopy cover and moderately dense shrub and herbaceous understory growth. The dominant vegetation observed within the wooded upland habitat during the inspection includes red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), red oak (*Quercus rubra*), sycamore (*Platanus occidentalis*), ash (*Fraxinus sp.*), white pine (*Pinus strobus*), Japanese barberry (*Berberis thunbergii*), raspberry (*Rubus idaeus*), burning bush (*Euonymus alatus*), Canada mayflower (*Maianthemum canadense*), sedges (*Carex sp.*), Christmas fern (*Polystichum acrostichoides*), false hellebore (*Veratrum viride*), dogtooth violet (*Erythronium americanum*), false Solomon's seal (*Maianthemum racemosum*), wild leek (*Allium tricoccum*), skunk cabbage (*Symplocarpus foetidus*), and poison ivy (*Toxicodendron radicans*). Wildlife observed during the inspection and associated with Cover Type 3 include red tail hawk, robin, blue jay, chickadee, flicker, and deer (scat and tracks).



3 – Wooded upland habitat (5/7/19).

4 – Wooded Floodplain Wetland

Cover Type 4 includes a wooded floodplain wetland area that is associated with Wachocastinook Creek. The floodplain wetland area occurs in the eastern portion of the area of concern. It is connected with a larger watercourse and wetland system that continues to the east and southeast of the project area. The wooded floodplain is fairly level with a gentle slope down to the east. Vegetation within the floodplain wetland provides dense tree canopy cover and dense to very dense shrub and herbaceous understory growth. The dominant vegetation observed within the wooded floodplain habitat during the inspection includes red maple (*Acer rubrum*), sycamore (*Platanus occidentalis*), ash (*Fraxinus sp.*), white pine (*Pinus strobus*), black cherry (*Prunus serotina*), elm (*Ulmus rubra*), silver maple (*Acer saccharinum*), hemlock (*Tsuga canadensis*), Japanese barberry (*Berberis thunbergii*), raspberry (*Rubus idaeus*), burning bush (*Euonymus alatus*), privet (*Ligustrum sp.*), multiflora rose (*Rosa multiflora*), shrub honeysuckle (*Lonicera tatarica*), gray dogwood (*Cornus racemosa*), arrowwood viburnum (*Viburnum dentatum*), Canada mayflower (*Maianthemum canadense*), sedges (*Carex sp.*), Christmas fern (*Polystichum acrostichoides*), false hellebore (*Veratrum viride*), violet (*Viola sp.*), cinnamon fern (*Osmundastrum cinnamomeum*), garlic mustard (*Alliaria petiolata*), jewelweed (*Impatiens capensis*), stinging nettle (*Urtica dioica*), sensitive fern (*Onoclea sensibilis*), fragrant bedstraw (*Galium triflorum*), cranesbill geranium (*Geranium maculatum*), Jack-in-the-pulpit (*Arisaema triphyllum*), skunk cabbage (*Symplocarpus foetidus*), poison ivy (*Toxicodendron radicans*) and bittersweet (*Celastrus orbiculatus*). Wildlife observed during the inspection and associated with Cover Type 4 include catbird, common yellowthroat, goldfinch, phoebe, red tail hawk, robin, blue jay, chickadee, flicker, bumble bee, mosquito, green frog, and deer (scat and tracks).



4 – Wooded floodplain wetland habitat (5/7/19).

5 – Wachocastinook Creek – Perennial Watercourse

Cover Type 5 consists of Wachocastinook Creek along the northern boundary of the area of concern. Wachocastinook Creek is a perennial watercourse contained within steep banks. Water depth within the stream channel during the inspection ranged from a few inches deep to up to approximately 2 to 3 feet deep in some of the deeper pools. The watercourse has a rock, sand and gravel substrate and likely provides habitat for fish species. The creek was reportedly relocated from the eastern edge of the northern hay field and near the northern edge of the ball fields (outside of project area) to its current location along the northern property boundary. Vegetation observed growing along the edges of the watercourse and on the steep banks adjacent to the watercourse includes sycamore (*Platanus occidentalis*), silver maple (*Acer saccharinum*), ash (*Fraxinus sp.*), locust tree (*Robinia pseudoacacia*), Japanese barberry (*Berberis thunbergii*), multiflora rose (*Rosa multiflora*), shrub honeysuckle (*Lonicera tatarica*), burning bush (*Euonymus alatus*), sedges (*Carex sp.*), Jack-in-the-pulpit (*Arisaema triphyllum*), and marsh marigold (*Caltha palustris*).



5 – Wachocastinook Creek – Perennial Watercourse (5/7/19).

According to the CT DEEP NDDB January 2019 letter, listed species observed on or near the area of concern include six (6) State listed vascular plant species including the Special Concern handsome sedge (*Carex formosa*), the Special Concern eastern few fruit sedge (*Carex oligocarpa*), the Endangered meadow horsetail (*Equisetum pratense*), the Endangered stiff gentian (*Gentianella quiquefolia*), the Special Concern naked miterwort (*Mitella nuda*), the Threatened sweet coltsfoot (*Petasites frigidus* var. *palmatus*), and three (3) State listed vertebrate animal species including the Special Concern slimy sculpin (*Cottus cognatus*), the Special Concern American kestrel (*Falco sparverius*), and the Special Concern wood turtle (*Glyptemis insculpta*). Information for these species was obtained from the iNaturalist.org website, the Minnesota Wildflowers website, the Go Botany website, the Connecticut Botanical Society website, the MA Natural Heritage and Endangered Species Program, and the CT DEEP website. Information for each species is included at the end of this report.

Listed Species

Handsome sedge – (Species of Special Concern) This is a perennial species that prefers part shade to shaded rich deciduous forest with average moisture and floodplains. The optimal time for identification of this species is during June and July when the sedge is blooming and then fruiting. This sedge ranges from 12 to 30 inches in height. This species could occur within the wooded upland and floodplain wetland areas within the area of concern. SSES recommends that an expert in sedge identification inspect the areas that are proposed for development, once plans are developed, in order to determine if this species is present within the work area and if it could be impacted by the future proposed development.

Eastern few-fruit sedge – (Species of Special Concern) This is a perennial species that prefers part shade to shaded average to dry soil moisture, rich woods, wooded slopes, and wooded ravines. The optimal time for identification of this species is during June and July when the sedge is blooming and then fruiting. This sedge ranges from 8 to 20 inches in height. This species could occur within the wooded upland area within the area of concern. SSES recommends that an expert in sedge identification inspect the areas that are proposed for development, once plans are developed, in order to determine if this species is present within the work area and if it could be impacted by the future proposed development.

Meadow horsetail – (Endangered) This is a perennial species that prefers partial shade to sun conditions in moist woods, wet meadows, and along stream banks. The optimal time for identification of this species is during late spring. This horsetail ranges from 8 to 16 inches in height. This species was not observed during our inspection of the area of concern during our May 7, 2019 inspection. This species could occur along Wachocastinook Creek and within the floodplain wetland.

Stiff gentian – (Endangered) This is a biennial species that prefers partial shade to sun conditions in wet meadows, swamps, ditches, shorelines, and rich woods. The optimal time for identification of this species is during August through September when this species blooms. This plant ranges from 9 to 30 inches in height. This species was not observed during our inspection of the area of concern during our May 7, 2019 inspection. This species could occur along Wachocastinook Creek and within the floodplain wetland.

Naked miterwort – (Special Concern) This species is a perennial herb that prefers shaded bogs, cedar swamps, and cool mossy woods. The optimal time for identification of this species is during May through August when this species blooms. This plant ranges from 3 to 8 inches in height. This species was not observed during the May 7, 2019 inspection and habitat for this species was not observed within the area of concern.

Sweet coltsfoot – (Threatened) This species is a perennial herb that prefers calcareous forested swamps and seeps. The optimal time for identification of this species is during March through May when this species blooms. This plant ranges from 8 to 14 inches in height. This species was not observed during the May 7, 2019 inspection and habitat for this species was not observed within the area of concern.

Slimy sculpin – (Species of Special Concern) This species is a small (+/- 3" long) freshwater fish that inhabits cold rocky streams and lakes. It is nocturnal and usually spends its time on the bottom of the stream. Based on our site inspection and existing conditions observed within the project area during the inspection, this species likely occurs in Wachocastinook Creek or nearby downstream watercourses.

American kestrel – (Special Concern) This species of falcon is approximately 9 to 12 inches long and prefers open grassy areas (such as hay fields) where it can hunt for prey. Prey can include insects, mice, voles, snakes, frogs, and small birds. Kestrels usually hunt from a conspicuous perch. No kestrels were observed during the May 7, 2019 inspection. Kestrels could utilize the hayfields for hunting prey. The habitat for this species could be enhanced by providing and maintaining nest boxes. See attached information sheet for more details.

Wood turtle – (Special Concern) This species of turtle is approximately 5 to 9 inches and prefers large streams and floodplain forests, wetlands and hay fields within approximately 1,000 feet of the large stream depending on the time of year. Wood turtles hibernate under water in the muddy banks along large streams. Females nest in spring to early summer in loose soils. This species is long-lived (40 to 60 years). Loss of habitat and habitat fragmentation are threats to this species. Wood turtles were not observed during the May 7, 2019 inspection. However, they could utilize the large stream corridors on and off the area of concern as well as the floodplain wetland and hay fields. Recommendations included in the information sheets should be incorporated into any future development of the area of concern.

Conclusion

During our May 7, 2019 inspection we were able to observe the existing conditions and the dominant vegetation within the cover types on the area of concern. The area of concern is dominated by hay fields, edge habitat, wooded upland, wooded floodplain wetland, and a large perennial watercourse (that was relocated). In our opinion, based on the existing conditions observed within the area of concern, suitable habitat for the two sedges, meadow horsetail, stiff gentian, slimy sculpin, American kestrel, and wood turtle could exist within the area of concern. Once plans for the area of concern have been developed, additional inspections for specific species should be conducted during the appropriate time of the year to observe

whether or not if any of the species are present within the proposed work area. Once a determination has been made to their possible presence within the work area, the DEEP

Natural Diversity Data Base and or other wildlife divisions within the DEEP should be consulted in order to determine the best management practices and mitigation measures that can be incorporated into the project plans in order to protect and preserve the observed listed species.

Respectfully submitted,

SOIL SCIENCE AND ENVIRONMENTAL SERVICES, INC.



Jennifer L. Beno
Biologist/Wetland Scientist

CT DEEP NDDB Letter – January 31, 2019



79 Elm Street • Hartford, CT 06106-5127

www.ct.gov/deep

Affirmative Action/Equal Opportunity Employer

*Bridging + Working Council
Committee
Curtis built in town - Friday*

January 31, 2019

Curtis Rand
Town of Salisbury
27 Main St, P.O. Box 548
Salisbury, CT 06068
crand@salisburyct.us

Project: Preliminary Site Assessment for Pope Property, Salmon Kill Road, Salisbury, CT
NDDB Determination No.: 201901054

Dear Mr. Rand,

I have reviewed the Natural Diversity Database maps and files regarding the area you provided for the Pope Property on Salmon Kill Road in Salisbury, Connecticut. According to our records there are known extant and historic populations of state listed species that occur in the vicinity of the site. I have attached a list of species with this letter.

Please be advised that this is a preliminary review and not a final determination. A more detailed review and impact assessment will be necessary to move forward with any DEEP environmental permit applications or other state funding applications. **This preliminary assessment letter cannot be used or submitted with your DEEP permit applications.** This letter is valid for one year.

To prevent impacts to State-listed species, field surveys of the site should be performed by a qualified biologist when these target species are identifiable. Botanical surveys should be performed by qualified botanist (recommended by The Connecticut Botanical Society or The New England Wildflower Society) when this target species is identifiable. A report summarizing the results of such surveys should include:

1. Survey date(s) and duration
2. Site descriptions and photographs
3. List of component vascular plant species within the survey area (including scientific binomials)
4. Data regarding population numbers and/or area occupied by State-listed species
5. Detailed maps of the area surveyed including the survey route and locations of State-listed species
6. Statement/résumé indicating the biologist's qualifications to work with the taxon.

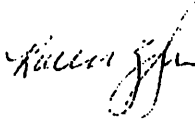
The site surveys report should be sent to our CT DEEP-NDDB Program (deep.nddbrequest@ct.gov) for further review by our program biologists along with an updated request for another NDDB review. If you do not intend to do site surveys to determine the presence or absence of state-listed species, let us know how you will protect the state-listed

species from being impacted by this project. You may submit these best management practices or protection plans with a new request for a more detailed NDDB review:

Natural Diversity Database information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with NDDB should not be substitutes for on-site surveys required for a thorough environmental impact assessment. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at (860) 424-3378, or karen.zyko@ct.gov. Thank you for consulting the Natural Diversity Data Base. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEEP for the proposed site.

Sincerely,



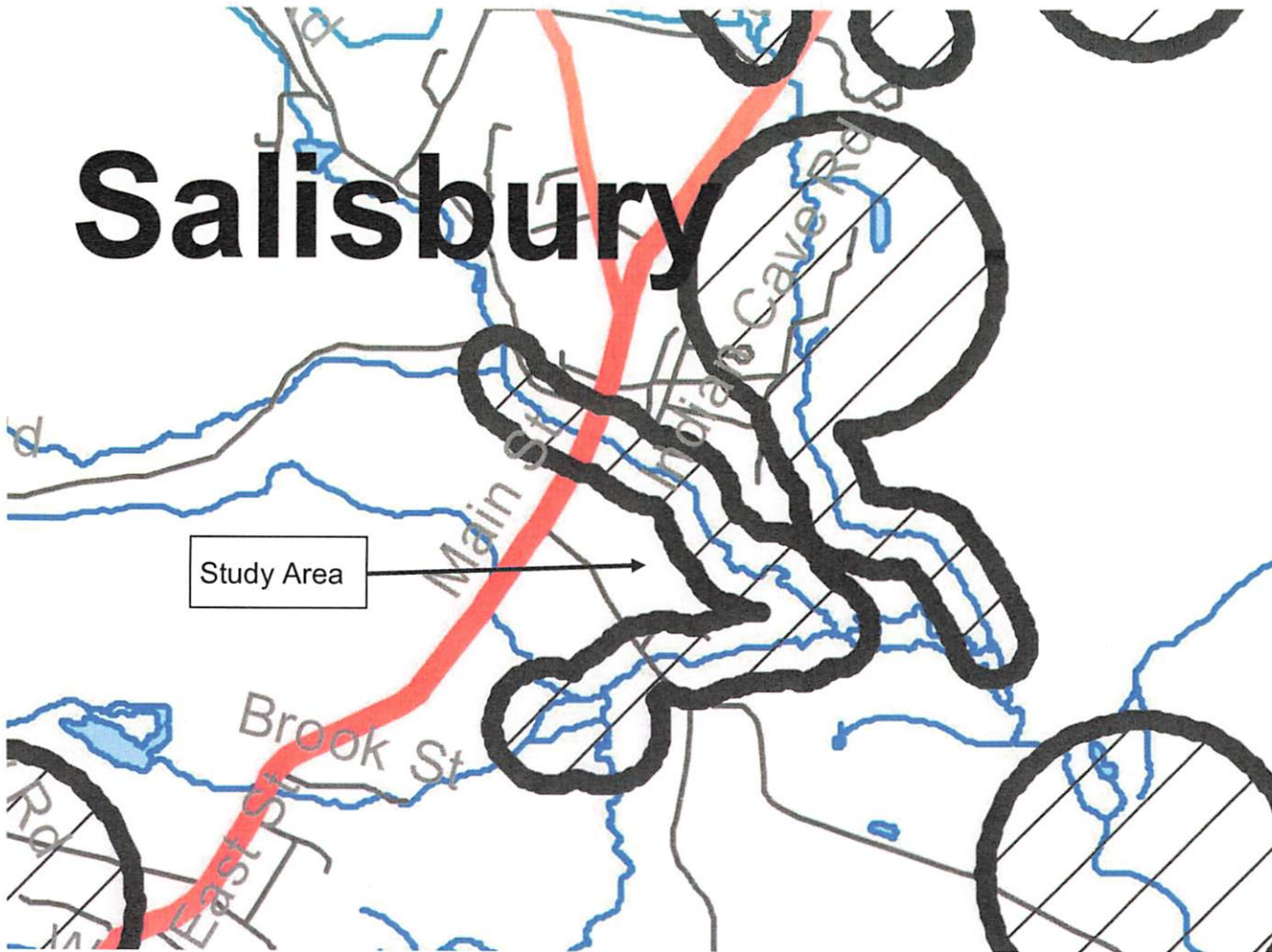
Karen Zyko
Environmental Analyst

Species List for NDDB Request

| | Scientific Name | Common Name | State Status |
|-------------------|---|-------------------------|--------------|
| Vascular Plant | | | |
| | <i>Carex formosa</i> | Handsome sedge | SC |
| | <i>Carex oligocarpa</i> | Eastern few-fruit sedge | SC |
| | <i>Equisetum pratense</i> | Meadow horsetail | E |
| | <i>Gentiana quinquefolia</i> | Stiff gentian | E |
| | <i>Mitella nuda</i> | Naked miterwort | SC |
| | <i>Petasites frigidus var. palmatus</i> | Sweet coltsfoot | T |
| Vertebrate Animal | | | |
| | <i>Cottus cognatus</i> | Slimy sculpin | SC |
| | <i>Falco sparverius</i> | American kestrel | SC |
| | <i>Glyptemys insculpta</i> | Wood turtle | SC |

E = Endangered, T = Threatened, SC = Special Concern

Page 1 of 1



Portion of State of CT DEEP Natural Diversity Data Base Map, Salisbury, CT
Dated December 2018

Map indicates known populations of Endangered, Threatened or Special Concern Species or significant natural communities in or near the project area.



Carex formosa (Handsome Sedge)

Pick an image for a larger view. See the [glossary](#) for icon descriptions.

Detailed Information

Spikes:



A single staminate spike up to 2 inches long at the top of the stem, which almost always has a few to several pistillate flowers at the very tip (gynecandrous). Below this terminal spike are 2 to 4 slender-stalked, pistillate spikes that almost always have 1 or 2 staminate flowers at the base. These lateral spikes are widely spaced and arising singly from the nodes with a leaf-like

bract at the base of the stalk. The stalk of the lowest spike is longest with the stalks becoming progressively shorter as they ascend the stem, the stalks initially erect to ascending, becoming drooping with maturity. Pistillate spikes are slender and cylindrical, up to about 1 inch long, erect and green at flowering time with white, thread-like styles, and the staminate spike with creamy yellow stamens.

Leaves and stems:



Leaves are basal and alternate, mostly near the base, 3 to 7 mm wide, shorter than the flowering stems, becoming arching. Stem leaf sheaths loosely wrap the stem and are papery, translucent whitish. The ligule (membrane where the leaf joins the sheath) is about as long as wide. Leaves are M-shaped in cross-section

when young, mostly hairless on the upper surface, the underside and edges variously covered in long, white hairs which continue down the back of the sheath.



Bases are wrapped in a sheath that is hairy, not fibrous, and typically tinged red to purple, turning brown as they wither with age. Stems are slender, 3-sided and mostly smooth but rough along the angles in the upper plant. Stems become leaning to arching, elongating up to 30 inches at maturity and are longer than the leaves. Not all plants produce flowering stems. Plants form loose to dense clumps.

Fruit:



Fruit develops in late spring through mid-summer, the pistillate spikes forming clusters of seeds (achenes), each wrapped in a casing (perigynium), subtended by a scale. The empty staminate scales persist after fruit has dropped off. Pistillate spikes each contain 10

Plant Info

Also known as:

Genus: [Carex](#)

Family: [Cyperaceae \(Sedge\)](#)

Life cycle: perennial

Origin: native

Status: • State Endangered

Habitat: part shade, shade; average moisture; rich deciduous forest, ravines, floodplains

Fruiting season: June - July

Plant height: 12 to 30 inches

Wetland Indicator Status: GP: FAC
MW: FAC
NCNE: FAC

MN county distribution
(click map to enlarge):



National distribution
(click map to enlarge):





to 45 fruits that are often tightly arranged on the stalk.



Pistillate scales are egg-shaped, translucent white tinged brown with a green midrib that turns brown, pointed at the tip or the midrib extending to an awn less than 1 mm long, and are shorter than the perigynia. **Perigynia** are green tinged or dotted red, 3.5 to 5 mm long, 1.7 to 2 mm wide, 2-ribbed with 7 to 12 faint veins, hairless, loosely wrapping the achene, oval-elliptic, tapering at the tip with 2 minute teeth at the tip of the short beak, and tapering to the stalkless base. **Achenes** are 2 to 2.5 mm long, up to 1.5 mm wide, 3-sided in cross-section, and mature to dark brown.

Notes:

Carex formosa is found in wooded ravines and river valleys in only a handful of locations in Minnesota. [According to the DNR](#), it is uncommon to rare throughout its range and its fragile habitat is a prime target for development, timber harvest, and livestock grazing. It was listed as a state Endangered species in 1996 and is currently listed as Threatened in Wisconsin.

Carex is a large genus, with over 600 species in North America and 150+ in Minnesota alone. They are grouped into sections, the species in each group having common traits. *Carex formosa* is in the [Hymenochlaenae](#) section; some of its common traits are: typically clump forming and forming loose colonies, leaves M-shaped in cross-section when young, spikes long and cylindric and drooping on slender stalks, terminal spike either all staminate or with a few perigynia (usually at the tip, occasionally the base), perigynia round in cross-section, 2-veined, beaked, the beak usually toothed, 3-sided achenes, often growing in woodlands.

Carex formosa is distinguished from other sedges in Minnesota by the combination of: hairy leaves, reddish basal sheaths, terminal spike mostly staminate with several perigynia at the tip, lateral spikes pistillate with 1 or 2 staminate flowers or empty scales at the base. It is most similar in appearance to another hairy Minnesota sedge: the also-rare [Carex davisii](#), which has pistillate scales that are long-awned and often longer than the perigynia, and its lateral spikes are almost always all pistillate with no staminate flowers at the base. Overall, *C. formosa* also resembles other members of the [Hymenochlaenae](#) section (*C. arctata* in particular), but they are hairless and have all-pistillate spikes longer than 1 inch.

More photos



[Handsome Sedge plant](#)



[Handsome Sedge plant](#)



[mature spikes](#)



[hairs on leaf and back side of the sheath](#)



Carex oligocarpa (Few-fruited Sedge)

Pick an image for a larger view. See the [glossary](#) for icon descriptions.

Detailed Information

Flower:



Separate staminate (male) and pistillate (female) spikes, with a single staminate spike up to about 1 inch long at the top of the stem. Below the staminate spike are 2 to 4 few-flowered, all-pistillate spikes, usually widely separated, though the uppermost 1 or 2 pistillate spikes may crowd the staminate spike. Lower pistillate spikes are longer stalked than upper

spikes, the stalks smooth and mostly erect. Pistillate spikes each have a leaf-like bract at the base of the stalk that loosely sheaths the stem, the bracts usually greatly over-topping the terminal spike.

Leaves and stems:



Leaves are basal and alternate, the widest 2 to 4.5 mm wide, mostly floppy, shorter or longer than the flowering stem. Stem leaf sheaths loosely wrap the stem, are whitish and hairless; both bract sheaths and leaf sheaths are convex at the tip and are elongated 1 mm or more above the base of the blade. The ligule (membrane where the leaf joins the sheath) is

about as long as wide. Leaves are hairless, M-shaped in cross-section when young.



Bases are wrapped in a reddish-purple sheath that is not fibrous. Stems are slender, 3-sided, hairless, smooth to slightly rough, erect to spreading, and may elongate up to 20 inches at maturity. Not all plants produce flowering stems. Plants form loose to dense clumps.

Fruit:



Fruit develops in late spring through early summer, the pistillate spikes forming clusters of seeds (achenes), each wrapped in a casing (perigynium), subtended by a scale. Pistillate spikes have 2 to 8 fruits, the perigynia ascending to erect and loosely overlapping on opposite sides of the stalk.

Plant Info

Also known as: Eastern Few-fruit Sedge, Rich Woods Sedge, Sparse-fruit Sedge

Genus: [Carex](#)

Family: [Cyperaceae \(Sedge\)](#)

Life cycle: perennial

Origin: native

Habitat: part shade, shade; average to dry soil; rich woods, wooded slopes, wooded ravines

Fruiting season: June - July

Plant height: 8 to 20 inches

Wetland Indicator Status: none

MN county distribution (click map to enlarge):



National distribution (click map to enlarge):





Pistillate scales are lance-elliptic, whitish with a green midrib that extends to a rough-textured awn .7 to 4.1 mm long, the scale body half or more as long as the perigynia, with the awn often longer than the perigynia especially on the lower part of a spike. **Perigynia** are green to yellowish-green, 3.5 to 4.7 mm long, 1.6 to 1.9 mm wide, hairless, not inflated, 51 to 67 impressed veins, weakly 3-sided in cross-section, elliptic to somewhat urn-shaped and widest above the middle, gradually tapering at the base, more abruptly tapered at the tip to a straight, toothless beak .3 to 1.2 mm long. **Achenes** are 2 to 3.4 mm long, weakly 3-sided in cross-section, widest above the middle, tapering at the base and maturing to

brown.

Notes:

Carex oligocarpa is an occasional sedge of deciduous woods, wooded bluffs and slopes, mostly along the Minnesota River valley and in the maple-basswood forests of our southeast counties. It reaches the northern edge of its range in Minnesota.

Carex is a large genus, with over 600 species in North America and 150+ in Minnesota alone. They are grouped into sections, the species in each group having common traits. *Carex oligocarpa* is in the [Griseae](#) section; some of its common traits are: clump forming or not, short to long rhizomatous, basal sheaths not fibrous, leaves M-shaped in cross-section when young, the leaf underside with 2 lateral veins more prominent than the midvein, widest leaves 6 mm or less, 3 to 6 spikes, terminal spike all staminate, lateral spikes mostly all pistillate, sometimes with a few staminate flowers at the tip (androgynous), lateral spikes subtended by a long-sheathing leaf-like bract, pistillate scales with a rough-textured awn, perigynia oval-elliptic and hairless with impressed veins (both fresh and dry), achenes 3-sided with 3 stigmas, usually growing in woodlands or open habitats.

Carex oligocarpa is distinguished from other *Carex* species by the combination of: clump forming, red-purple at the base, sheaths mostly convex at the tip and extended above the base of the leaf, all-staminate terminal spike, 2 to 4 pistillate spikes with 2 to 7 perigynia per spike, pistillate scales with a rough-textured awn often longer than the perigynia, perigynia with up to 59 impressed veins, the short beak straight and toothless.

Carex oligocarpa most closely resembles [Carex hitchcockiana](#), which has larger perigynia, hairy sheaths, and is brown at the base. Perigynia with very short beaks resemble [Carex grisea](#), which is essentially beakless, the uppermost pistillate spike almost always crowds the staminate spike, may have a few staminate flowers at the tip of pistillate spikes (androgynous), widest leaves are up to 8.2 mm, and basal sheaths are often brown or less strongly red-purple.

More photos



[Carex oligocarpa plant](#)



[Carex oligocarpa plant](#)



[Carex oligocarpa plant](#)



[staminate spike may be long-stalked](#)



[more spikes](#)

Photos by K. Chayka and Peter M. Dziuk taken in Fillmore County.

Comments

Have you seen this plant in Minnesota, or have any other comments about it?

Posted by: Bonnie Harper-Lore - Our Minnetonka backyard
on: 2018-07-30 13:35:08

Verified by Welby Smith to be the first recorded sighting in Hennepin County.



Funding provided by the [Minnesota Environment and Natural Resources Trust Fund](#) as recommended by the Legislative-Citizen Commission on Minnesota Resources.

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Equisetum pratense (Meadow Horsetail)

Contributed by Cindy Hoffmann

Pick an image for a larger view. See the [glossary](#) for icon descriptions.

Detailed Information

Leaves and stems:



The sterile stem is slender, green and has whorled branches that grow horizontal (parallel to the ground) to drooping. The "leaves" are reduced to a toothed sheath that surrounds the stem, with 8 to 19 teeth that are dark brown with white edging. The stem has a small central cavity; branches are solid and rough to touch.

The first sheath on the branch (aka first internode) has 3 or 4 teeth. The first internode on the lowest branch is shorter than the stem sheath, though the first internode on branches higher up may be as long as or very slightly longer than the stem sheath.

Fruit:

Fertile stems are not like sterile stems, identified by the blunt-tipped, 1-inch cone at the tip of the stem. Initially, the stem is pale pink to brownish and there are no branches, but after the spores are released the fertile stem turns green and branches develop, becoming like sterile stems.

Notes:

Meadow Horsetail spreads both by spores and vegetatively from rhizomes and may create large colonies. It may be confused with [Field Horsetail](#) (*Equisetum arvense*) or [Marsh Horsetail](#) (*E. palustre*), both of which have spreading to ascending branches, not drooping. In addition, while *E. palustre* also has branch internodes shorter than the stem sheath, it has 5 or 6 teeth on the branch sheath and hollow branches. While *E. arvense* has 3 or 4 teeth on the branch sheath like *E. pratense*, the first internode on the branch is distinctly longer (by 3-4mm) than the stem sheath. In contrast, *E. pratense* has 3 teeth on the branch sheath and the first internode on the branch is shorter than the sheath on the main stem. Note that when comparing the internode length to the stem sheath, it is important to look at the lowest branch. On *E. pratense*, the first internode on upper branches may be as long as or very slightly longer than the stem sheath, which can make it difficult/confusing to identify.

More photos



[Meadow Horsetail plant](#)

Plant Info

Also known as:

Genus: [Equisetum](#)

Family: [Equisetaceae \(Horsetail\)](#)

Life cycle: perennial

Origin: native

Habitat: part shade, shade, sun; moist woods, wet meadows

Fruiting season: mid to late spring

Plant height: 8 to 16 inches

Wetland Indicator Status: GP: FACW
MW: FACW
NCNE: FACW

MN county distribution (click map to enlarge):



National distribution (click map to enlarge):





[Meadow Horsetail plants](#)



[close up of pale edging on stem teeth](#)



[Meadow Horsetail woodland habitat](#)



[a colony of Meadow Horsetail](#)



[first internode length, not the lowest branch](#)



Photos by K. Chayka taken at Richard T. Anderson Conservation Area, Hennepin County. Photos courtesy Peter M. Dziuk taken in Aitkin County.

Comments

Have you seen this plant in Minnesota, or have any other comments about it?

Posted by: Charles A
on: 2017-12-08 09:53:03

Perhaps you can clarify something for me. Both Hauke, in Flora of North America, and Chadde, in Minnesota Flora, state that the first internodes on the lowest branches of *Equisetum pratense* are equal to or longer than the adjacent stem sheath on the main stem. Is this incorrect? Your photograph shows the opposite.

Posted by: K. Chayka
on: 2017-12-08 19:15:19

Charles, that's a very interesting observation. I went back and reviewed all of our *E. pratense* images looking at the lowest branch on a number of plants. On those where I could actually make it out, more often than not the branch sheath was shorter than the stem sheath, only one was longer. Perhaps there is an age factor in play

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You are here: Dichotomous Key > Equisetaceae > Equisetum > Equisetum pratense

New England Distribution

Adapted from BONAP data

Native
 county documented



about the labels on this map

Found this plant? Take a photo and post a sighting.

North America Distribution

Adapted from BONAP data



Native to North America?
 enlarge
 Yes

Sometimes Confused With

Equisetum arvense:

leaves with very narrow white margins and a central stem cavity that is ca. 25% of the entire stem diameter (vs. E. pratense, with leaves with relatively broad white margins and a central stem cavity that is 35-50% of the entire stem diameter).

Family

Equisetaceae

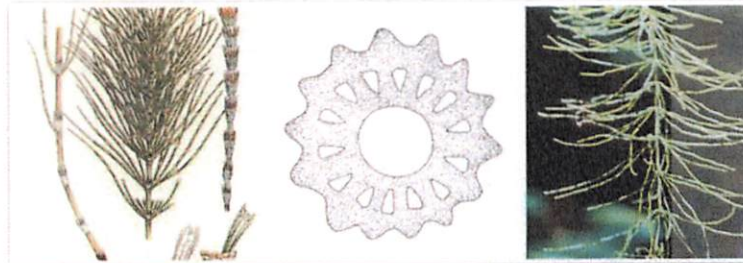
Genus

Equisetum

Need Help?

GET HELP

Equisetum pratense Ehrh.
 meadow horsetail



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Facts About

Meadow horsetail is common in the northern United States and Canada. In New England it is absent from southeast, rare in Connecticut and New Hampshire, and scattered in Maine. Meadow horsetail can be distinguished from field horsetail (Equisetum arvense) and other horsetails (Equisetum) by its delicate, feathery, horizontally spreading branches. It has been used as a winter food by the Inupiat Eskimos, who preserved it in seal oil.

Habitat

Forests, meadows and fields, woodlands

Characteristics

| | |
|---------------------------------|---|
| Habitat | terrestrial |
| New England state | Connecticut, Maine, Massachusetts, New Hampshire, Vermont |
| Stem form | the stem is relatively straight |
| Branches | there are branches off the main stem, but these branches are not branched |
| Cone tip shape | The tip of the spore cone is blunt |
| Sheathes on older stems | the leaf sheathes persist in older stems |
| Sheath color | the leaf sheath is mainly black |
| Stem cross-section | up to half of the stem diameter is occupied by the hollow central cavity |
| Number of stem ridges | 8-18 |
| Stem color | the aerial stem color is green |
| Sheath border color | the border of the leaf sheath has a wide white edge |
| Length of branch section | the first internode of the branch is equal to or longer than the associated stem sheath |

Show All Characteristics

Wetland Status

Usually occurs in wetlands, but occasionally in non-wetlands. (Wetland indicator code: FACW)

New England Distribution and Conservation Status

Distribution

| | |
|---------------|---------|
| Connecticut | present |
| Maine | present |
| Massachusetts | present |
| New Hampshire | present |
| Rhode Island | absent |
| Vermont | present |

Conservation Status

Exact status definitions can vary from state to state. For details, please check with your state.

| | |
|---------------|---|
| Connecticut | extremely rare (S-rank: S1), endangered (code: E) |
| Massachusetts | rare (S-rank: S2) |
| New Hampshire | uncommon (S-rank: S3), W (code: W) |
| Vermont | uncommon (S-rank: S3) |

Information from Dichotomous Key of Flora Novae Angliae

5. *Equisetum pratense* Ehrh.

meadow horsetail. CT, MA, ME, NH, VT; not in southeastern New England and scattered in ME. Meadows, woodlands, riparian forests with rich soils.

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Connecticut Plants

Stiff Gentian (Agueweed)

***Gentianella quinquefolia* (L.) Small**

Stiff gentian is endangered in the state of Connecticut.

- Synonyms: *Gentiana quinquefolia*
- Family: gentian (Gentianaceae)
- Habitat: wet fields, rich woods
- Height: 6-30 inches
- Flower size: 3/4 inch long
- Flower color: purple
- Flowering time: August to October
- Origin: native

[next blue/purple flower](#)

[next in gentian family](#)

[next rare plant](#)



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Connecticut Plants

Naked Miterwort
Mitella nuda L.

Naked miterwort is rare in Connecticut, and the state classifies it as a species of special concern. The "naked" in the name comes from the flower stalk, which is naked of leaves. This is in contrast to the related plant [miterwort](#), which has a pair of leaves on its stem.

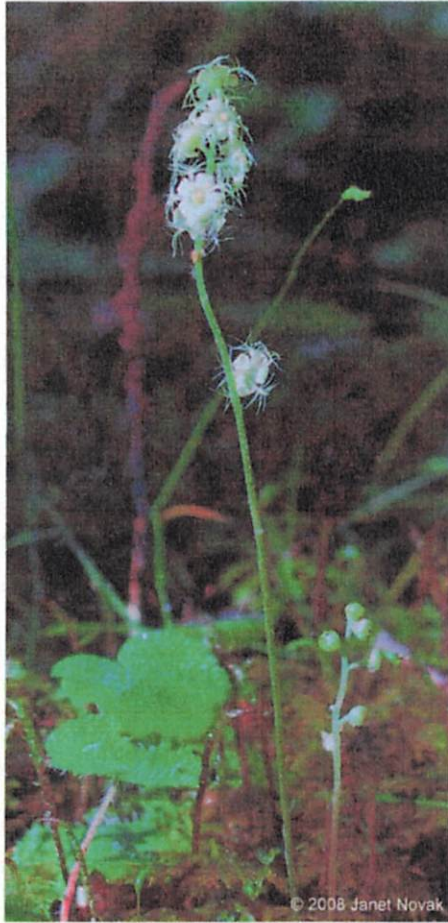
[next green/brown flower](#)

[next in saxifrage family](#)

[next rare plant](#)

- Family: saxifrage (Saxifragaceae)
- Habitat: bogs and wet woods, usually in cool areas
- Height: 3-8 inches
- Flower size: 3/16 inch across
- Flower color: pale green
- Flowering time: May to August
- Origin: native

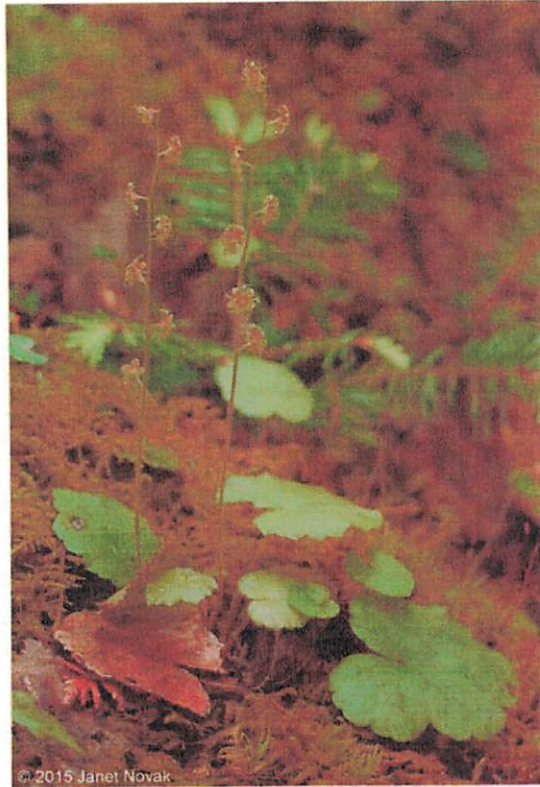




Naked miterwort growing in sphagnum moss in wet woods. Photographed in mid-June Clarendon Township, Quebec.

Mitella nuda

<http://www.ct-botanical-society.org/Plants/view/390>



© 2015 Janet Novak
Photographed in early June in Bruce County, Ontario.

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**Natural Heritage
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Massachusetts Division of Fisheries & Wildlife

Sweet Coltsfoot
***Petasites frigidus* (L.) Fr.**
var. *palmatum* (Aiton) Cronquist

State Status: Endangered
Federal Status: None

DESCRIPTION: Sweet Coltsfoot is a perennial herb with flowering stems 20 to 35 cm (8-14 in) in height. In Massachusetts, where it rarely flowers, *Petasites* is most easily identified by its strongly palmate, vegetative basal leaves which bear distinctive, fine, paired purple lines on the stem. Basal leaves may be 50 to 100 cm (20-39 in) wide, with a petiole up to 100 cm, and the leaf undersides are hairy. Flowering stems are distinctively hairy, with an inflorescence consisting of up to 20 flowering heads.

SIMILAR SPECIES: The basal leaves of *Petasites frigidus* may be confused with buttercups (*Ranunculus*) or geraniums (*Geranium* spp.), which may have a similar palmate arrangement. Both groups typically lack the rounded lobes of *P. frigidus* and the paired purple lines on the basal leaf petiole. Butterbur (*Petasites hybridus*), one of three living species in the genus, is a European species that has been documented in eastern Massachusetts and Hampden County (Magee and Ahles 1999). Its cordate leaves more closely resemble those of Coltsfoot (*Tussilago farfara*), an invasive species from Europe that is closely allied to the *Petasites* clade and occurs with *P. frigidus*.



Distribution in Massachusetts
1987-2012
Based on records in the
Natural Heritage Database



Top - Flowering stem, Québec. Bottom - Flowering stem past seed, Québec.
Photos: Mike Jones, NHESP

ASSOCIATED SPECIES: *P. frigidus* occurs with a mix of temperate and boreal canopy species dominate these sites, including White Pine (*Pinus strobus*), Hemlock (*Tsuga canadensis*), Yellow Birch (*Betula alleghaniensis*), and Balsam Poplar (*Populus*

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

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balsamifera). Co-occurring herbaceous species include Christmas Fern (*Polystichum acrostichoides*), Maidenhair (*Adiantum pedatum*), Chinese Hemlock-parsley (*Conioselinum chinense*), and Grass-of-Parnassus (*Parnassia glauca*).

HABITAT: *P. frigidus* historically occurred in forested swamps and calcareous fens at a dozen sites throughout the mainland portion of the state. Several historic locations in the Connecticut River Valley occurred in nondescript, forested wetlands dominated by Red Maple (*Acer rubrum*) and other temperate canopy species. In eastern Massachusetts, historic data are vaguer and it is difficult to determine the former habitat associations of *P. frigidus* in those areas. Where the species persists in Berkshire County, it occurs on seepages in sloping, calcareous forested habitats, sometimes occurring over a continuous area greater than one acre.

THREATS: Potential threats to Sweet Coltsfoot in Massachusetts include direct loss of adult plants during forestry activities and trail maintenance or development. Several invasive species, such as Coltsfoot, have colonized the remaining populations and may compete with it for space on forested hillsides. As a subarctic species at the southern extent of its range, *P. frigidus* may respond poorly to shifts in forest community structure caused by regional climate change.

RANGE: *P. frigidus* is widely distributed in forested, tundra, and alpine habitats across subarctic North America, from Labrador to Alaska south to Connecticut, Michigan, Wisconsin, and the mountains of California. The species is uncommon in the high arctic of North America but occurs on some Canadian arctic islands. *P. frigidus* occurs throughout boreal Eurasia, including Svalbard, and on some Siberian Arctic islands, including Wrangel Island (e.g., Porsild 1957; Magee and Ahles 1999; Aiken et al. 1999). The European variety is var. *frigidus*, which differs from our var. *palmatus* in having pinkish-white flowers and less strongly dissected leaves.

MANAGEMENT RECOMMENDATIONS: The exact management needs of Sweet Coltsfoot are not known. Known locations should be avoided during forestry activities and monitored for population changes in response to successional changes. Management plans for this species may be developed in consultation with NHESP.



Top: Leaf, Williamstown, MA. Bottom: Basal petiole, showing distinctive, paired, purple lines. Williamstown, MA. Photos: Mike Jones, NHESP.

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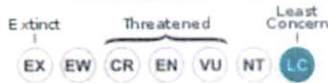
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Conservation status



Least Concern (IUCN 3.1)^[1]

Scientific classification

Kingdom: [Animalia](#)
 Phylum: [Chordata](#)
 Class: [Actinopterygii](#)
 Order: [Scorpaeniformes](#)
 Family: [Cottidae](#)
 Genus: [Cottus](#)
 Species: *C. cognatus*

Binomial name

Cottus cognatus

[J. Richardson](#), 1836

Synonyms

Cottus formosus
Cottus franklini
Cottus gracilis
Cottus kaganowskii
Cottus philonips

The **slimy sculpin**, *Cottus cognatus*, is a freshwater species of fish belonging to the family Cottidae, which is the largest sculpin family. They usually inhabit cold rocky streams or lakes across North America, ranging from the [Great Lakes](#), southeast Minnesota, northeast Iowa, southwest Wisconsin and northeast Canada. Slimy sculpins have also been found roaming the cold streams of eastern Siberia.^[2] They are commonly confused with their closely related relatives, [Mottled sculpin](#) (*Cottus bairdi*), and with [tubenose gobys](#) who are both freshwater fishes as well. The slimy sculpin is a nocturnal fish that usually spends most of its time on the stream bottom and seeks shelter under rocks and logs, especially during spawning season. When it swims, it sometimes appears to be “hopping” along the bottom because of its inefficient ability to swim. This is partly due to the absence of a [swim bladder](#), which normally gives [buoyancy](#) to a fish.^[2]

The fish has been studied in waters where there is current [freshwater acidification](#). Sculpin were found to be less active and have lower rates of reproduction when found in these waters. For these reasons, slimy sculpin have been identified as a good [indicator species](#) for changes in acidification among lakes, ponds,

and streams.^[3]

Contents

- [1 Distribution](#)
- [2 Physical description](#)
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Distribution [\[edit\]](#)

Slimy sculpin are native to the United States, Canada, and the Russian Federation. In North America, slimy sculpins are found mainly in [Lake Superior](#) and its [tributaries](#), [Lake Michigan](#), and small cold streams found in southwestern Wisconsin, as well as the upper [Mississippi River](#) basin.^[4] They have also been found in other areas of the North America such as southeast Minnesota (mostly in the [Mississippi River](#)), northeast Iowa, the upper [Columbia River](#), Alaska, and most all of Canada, especially in Ottawa. Slimy sculpins have also been found in eastern Siberia, Russia.^[2]

Physical description [\[edit\]](#)

The slimy sculpin can easily be distinguished by its pair of free and independent [pelvic fins](#), as well as not possessing any scales.^[5] The first and second lobed [dorsal fins](#) are narrow and touch, the first dorsal fin has 7-9 soft spines while the second has 16-18 fin rays. The lateral line ends below the second dorsal fin and is incomplete, but the [lateral line system](#) still helps orient the slimy sculpin in streams by balancing the pressure of currents. The anal fin has 11-13 fin rays and the [pelvic fins](#) possess 13-14 fin rays and is in the thoracic position.^[6] The mouth and snout are terminal and very wide, and also contain a band of fine conical teeth in both the upper and lower jaw, but do not possess [barbels](#). Adults weigh in around 3-7g and measure up to 6.3-9.1 cm long. The maximum weight of a slimy sculpin is 16.86g and the maximum length is 12.8 cm.^[7] When the fish moves, it is an inconsistently rapid and darter-like motion that looks like it's hopping due to its irregular compressed body shape. The sides, back and head of slimy sculpins are dark brown/olive and are mottled with dark irregular blotches and a light cream/white belly. If slimy sculpins lie motionless for a while they camouflage in so well with their surroundings that it is almost impossible to distinguish them.^[7] Although they don't have any scales, they do have a few fine prickles anteriorly below the lateral line.^[8] Slimy sculpins often look very similar to the [tubenose goby](#) as well.

Habitat [\[edit\]](#)

Slimy sculpins often inhabit swift rocky-bottomed cold streams, [oligotrophic](#) lakes, and even brackish

waters at a preferred temperature range of 9-14 °C.^[4] Nocturnally active fishes, they usually roam around in deeper waters ranging from 37–108 meters deep.^[7] During the breeding season, females often lay their eggs under sheltered areas like large objects such as rocks or tree roots found at the bottom of lakes or streams that males will guard.

Reproduction[[edit](#)]

Males often become dark on their backs and sides, and orange on their first dorsal fin during mating season.^[5] Males having orange on their first dorsal fin during breeding season is a visual handicap, meaning that they can be more easily preyed, yet still survive- showing to females that they are fit and have high reproductive success, therefore females are more attracted to these visually handicapped males. Males find nesting sites about 12 cm wide for females, and attract them to these nesting sites until spawning occurs which usually takes place in late April and May under protected areas such as stones or tree roots.^[6] Once the eggs are laid, males drive the females out and lure a new female into the nest to lay her eggs. Males then protect the nest for 3–4 weeks containing many females' eggs until all of the eggs hatch. Male slimy sculpins have also been seen protecting their young after hatching as well.^[8] Slimy sculpins live up to 4–7 years.

Diet[[edit](#)]

The primary food slimy sculpin prey on is invertebrate benthic insects, which make up 85% or more of their diet, but has also been known to eat crustaceans, fish eggs, and small fish. The invertebrate benthic insects on which the sculpin prey includes aquatic insects such as [mayflies](#), [caddis flies](#), [stoneflies](#), and [dragonflies](#).^[4] Predacious fish that eat slimy sculpin are [lake trout](#), [brook trout](#), [salmon](#), [northern pike](#), and [burbot](#) that are native to cool freshwater streams just like the slimy sculpin. There is speculation that sculpins have been known to prey on trout egg that were loose from the [redds](#). However, sculpins predation on [stoneflies](#) has reduced stonefly predation on trout eggs and their young.^[7]

Conservation status[[edit](#)]

This species is currently at low concern for conservative action and does not need protection or major management plans.^[2]

References[[edit](#)]

- ¹ [^] NatureServe (2013). "*Cottus cognatus*". *The IUCN Red List of Threatened Species*. IUCN. 2013: e.T202658A15363317. doi:10.2305/IUCN.UK.2013-1.RLTS.T202658A15363317.en. Retrieved 15 January 2018.
- ² [^] ^a ^b ^c ^d NatureServe. 2013. *Cottus cognatus*. The IUCN Red List of Threatened Species 2013: e.T202658A15363317. doi:10.2305/IUCN.UK.2013-1.RLTS.T202658A15363317.en.
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Thank you for visiting the New Hampshire Fish and Game Department website. www.wildlife.state.nh.us



Bridle Shiner

NH Conservation Status: Threatened

State Rank: Imperiled

Scientific Name: *Notropis bifrenatus*



Distribution: Bridle shiners were once common in suitable habitat from the St. Lawrence River watershed to the Atlantic slope drainages from southern Maine to South Carolina.

Description: The bridle shiner is a small minnow species with a black lateral band that extends from the tip of the snout, through the eye, back to the base of the tail. It is golden in color, with large, diamond shaped scales and a white underbelly.

Bridle shiners may be confused with juvenile creek chubsuckers, which also have a prominent lateral band. The mouth of the creek chubsucker is sucker-like and pointed downward, compared to the mouth of the bridle shiner, which is positioned just below the tip of the snout. Juvenile creek chubsuckers, and most other minnow species, also have smaller scales than bridle shiners.

Species commonly confused with: Blacknose dace, juvenile creek chubsucker, juvenile fallfish

Habitat: Bridle shiners depend on dense communities of submerged aquatic vegetation for survival. This habitat may be found along the shorelines and coves of lakes and ponds, the backwaters of larger rivers, and in slow flowing streams.

Life History: The bridle shiner is a short lived species with a life span that rarely exceeds two years. Spawning bridle shiners congregate in open spaces above dense stands of aquatic plants, such as *Myriophyllum* (milfoil). Spawning takes place in late spring and early summer. Aquatic vegetation with thick foliage, including *Myriophyllum*, *ceratophyllum* (coontail), and *chara* (stonewort), appears to provide important spawning habitat for adults and nursery habitat for recently hatched juvenile bridle shiners. Bridle shiners feed on zooplankton and aquatic invertebrates. They move with a distinctive stop and start motion, rarely gliding like other minnow species such as the golden shiner, with which it is often observed. Bridle shiners forage in areas with little or no flow, usually suspended about midway between the surface and the bottom. They are



The bridle shiner (bottom) and the juvenile creek chubsucker (top) are similar in appearance. Note the smaller scales and the downward turned mouth of the creek chubsucker

often found in loose groups or clusters. When alarmed, individuals scatter rapidly among the vegetation.

Origin: Native

Conservation/Management: Bridle shiner populations have suffered significant declines over the last few decades. There is only one remaining population of bridle shiners in Pennsylvania, where the species was once considered abundant. Bridle shiners have been extirpated from the state of Maryland and from a number of waterbodies in Massachusetts. Despite an extensive survey effort, the New Hampshire Fish and Game Department (NHFGD) documented bridle shiners at only 6 of 21 sites where they were recorded as present in 1938. The reasons for the apparent extirpations from certain water bodies are not always clear and multiple causes are probable. In some waterbodies, including Winisquam Lake, Canobie Lake, and Shadow Lake, submerged aquatic vegetation has been reduced to just a small fraction of the overall shoreline habitat. The loss of aquatic vegetation is a problem common to lakes and ponds with increasing levels of shoreline development. Even marginal reductions in aquatic vegetation may make bridle shiners more vulnerable to predators, both native and introduced, possibly reducing the population below the numbers required for replacement. Bridle shiners are known to coexist with bass and other introduced predators, like black crappie, in water bodies with intact shoreline habitat



Bridle shiners may be surveyed with a dip net due to their habitat of congregating in loose schools among stands of aquatic vegetation.

Water level drawdown has the potential to extirpate bridle shiners from a waterbody. Water level drawdowns occur for dam maintenance, flood storage, dock repair for shoreline property owners, or vegetation control. Drawdowns during winter expose the roots of aquatic vegetation to dessication and freezing, causing temporary die back. The overall reduction in aquatic plants will impact bridle shiners during the growing season. Water level draw downs during winter may have a direct effect on bridle shiners by preventing access to near shore habitat in the early spring. Bridle shiners have been observed using overhanging banks and shrubs as cover in late winter and early spring before the emergence of aquatic plants. Bridle shiners are extremely sensitive to unnatural water level fluctuations during the growing season, when spawning is occurring and juveniles seek refuge in shallow water among submerged aquatic plants. With a life span of only two years, a single draw down event could decimate an entire population.



Bridle shiner spawning behavior has been observed over stands of variable milfoil. These two individuals were photographed at the northern end of Lake Winnepesaukee in Moultonborough.

In some cases, bridle shiners have adapted to the impounded conditions upstream of a small dam, culvert, or bridge. Drainage of this upstream habitat may extirpate the local population of bridle shiners. Dam removal, culvert, or bridge replacement should proceed with caution in bridle shiner habitat. Sediment deposition upstream of the dam may have filled in the original wetland, pond, or slow flowing stream habitat that the bridle shiners inhabited before the construction of the dam or road. Rapid draining of the impoundment may result in a narrow channel with riffle habitat that is unsuitable for bridle shiners. Draw down of the impoundment should occur slowly to give aquatic plants time to adjust to the new water level. In some cases, sediment may have to be removed to ensure that adequate

habitat for bridle shiners will exist when the project is complete.

As visual foragers, bridle shiners are sensitive to water clarity and are therefore susceptible to the effects of eutrophication and siltation. Declines in water quality have been associated with urbanization, which has been

shown to alter fish communities. Eutrophication has the combined effect of reducing visibility, altering aquatic plant communities, and reducing oxygen levels. Bridle shiners are known to exist in dark or tea colored water, yet they are unlikely to persist in areas with chronic turbidity issues resulting from landuse activities in the watershed or persistent boat wakes. Naturally vegetated buffers, with a width of at least 15 m, should be maintained along the shorelines of water bodies known to support bridle shiner habitats. It is critical to prevent nutrient and sediment loading into bridle shiner habitat from fertilizers, failed septic systems, and stormwater runoff throughout the contributing watershed.

Recommendations:

- Continue to map the distribution of bridle shiners in New Hampshire.
- Draft a Bridle Shiner Recovery Plan which will identify critical habitat for protection, populations vulnerable to extirpation, potential restoration opportunities, and research needs
- Review permit applications and make recommendations to avoid impacts to bridle shiner habitat.

Distribution Map: Wildlife Action Plan Species Profile [^]

Connecticut Department of Energy & Environmental Protection

AMERICAN KESTREL

Falco sparverius

State Threatened Species



Background

The American kestrel is a small, slender falcon that is about the size of a robin. It is found in open habitats that have plenty of nesting cavities and hunting perches.

Kestrels can be seen in the state throughout the year. They are considered uncommon residents in winter and somewhat common migrants in fall and spring. Migrant populations increased during the early 1900s but breeding populations were comparatively low. Kestrels were more numerous when agriculture was at its peak in Connecticut. Currently, with the disappearance of agriculture, along with the regrowth of forests and an increase in suburban development, open, grassy areas are in short supply. This change in Connecticut's landscape has caused many wildlife species that rely on open areas, including the kestrel, to experience long-term declines. Kestrels also were negatively affected by the use of organochlorine pesticides, such as DDT. DDT was banned from use nationwide in 1972.

The American kestrel was listed as threatened on Connecticut's Endangered, Threatened, and Special Concern Species List in 2004, primarily due to a lack of information, coupled with a perceived decline in nesting and migrating numbers and diminishing habitat.

Range

American kestrels are found throughout most of North and South America. Most of the kestrels that breed in North America overwinter in the United States and Mexico, although a small proportion migrate as far south as northern South America.



Description

The American kestrel is the smallest falcon found in North America. Like most falcons, kestrels have long, pointed wings and long tails. The birds are easily recognized by two vertical black lines on the cheeks and a rufous-colored back and tail. The female has rufous-colored wings while the male has black-banded, bluish-gray wings. This species is the only falcon in which the male and female show such a marked difference in plumage. The kestrel ranges in size from 9 to 12 inches long with females being larger than males.

Habitat and Diet



Kestrels prefer open grassy or shrubby areas with short vegetation in which to hunt for their prey. In Connecticut, kestrels are usually seen around agricultural areas (hay fields, orchards, pastures), airports, large parks, and power line right-of-ways. Meadows, grassy fields, and old fields also may be inhabited. It is not unusual to find kestrels using urban and suburban areas and even buildings (barns, silos, cornices) for nest sites. Kestrels require natural tree cavities or nest boxes for nesting, along with perches in the form of trees, shrubs, or telephone poles.

The kestrel's diet varies seasonally and consists mainly of insects, including grasshoppers, crickets, beetles, dragonflies, butterflies, moths, and cicadas. Mice, voles, shrews, small snakes, frogs, and small birds also are eaten. Kestrels typically hunt from a conspicuous perch, although they occasionally hover over an open area when perches are lacking.

Life History

Connecticut's nesting kestrels begin courtship in late March to early April. An average of 4 to 5 brown-spotted eggs are laid by the end of April in a natural tree cavity or man-made nest box on little or no nesting material. They are incubated, primarily by the female, for 29 to 31 days. Males catch most of the food for the brooding female and, later, for the developing young. Usually 3 to 5 chicks are hatched and will grow quickly. The chicks are ready to fledge (reach flying stage) about a month after hatching. After fledging, the young stay with the adult birds for several weeks. In Connecticut, American kestrels will usually have 1 brood per season and will renest if the first nest fails.

Interesting Facts

Another name for the kestrel is the sparrow hawk, although birds are not a main prey item.

Kestrels have a habit of pumping their tail feathers up and down when perched, especially after landing. They are known for their rapid flight and have been recorded to fly between 22 and 39 m.p.h.

Kestrels are quite vocal. Their call is a loud, repeated "killy, killy killy" when they are excited or alarmed.

American kestrels do not need to drink free-standing water. They get all the water they need from the moisture of their prey.

Some of the predators that hunt kestrels are great-horned owls and red-tailed hawks. Other predators that have been known to attack raptors include coyotes, bobcats, skunks, raccoons, crows, and ravens.

Populations of the larger Cooper's hawk increased throughout northeastern North America from 1976-2003, and studies at Hawk Mountain Sanctuary, in Pennsylvania, and elsewhere have suggested this species preys on kestrels.

Kestrels are protected by the federal Migratory Bird Treaty Act of 1918 and Connecticut General Statutes Sec. 26-92 and Sec. 26-311 (threatened and endangered species legislation).

Conservation Concerns

According to Hawk Mountain Sanctuary, data from raptor migration counts, Breeding Bird Surveys, and Christmas Bird Counts indicate that American kestrel populations have declined in much of northeastern North America (including Connecticut) since 1974. Loss of habitat is the most likely cause of the kestrel decline in Connecticut. The number of farms in the state has been decreasing, many old agricultural fields are returning to forest, and suburban development has replaced suitable habitat. A lack of available nest cavities also can limit the number of kestrel breeding pairs.

What You Can Do

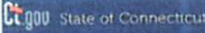
Because kestrels do not excavate their own nesting cavities, they seek out ready-made homes, such as




abandoned woodpecker holes or nest boxes provided by people. Specially-made nest boxes have helped kestrels throughout the country in areas where there are few natural cavities. Nest box programs for kestrels enable populations to increase in locations where nest sites are limiting. If you live near suitable habitat, you should consider providing and maintaining nest boxes for kestrels. Box plans are available by sending an E-mail to the Wildlife Division at deep.wildlife@ct.gov. To be successful, nest boxes should be placed in open field habitat. Preferred habitats are grasslands, pastures, orchards, and hay fields with cover at about 10 inches high. Nest boxes require continuous maintenance and should be monitored to prevent non-native starlings from using them. A program to promote natural nest sites (cavities in snags) should occur along with a nest box program.



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WOOD TURTLE

Glyptemys insculpta

State Species of Special Concern



Background

Wood turtles may be found throughout Connecticut, but they have become increasingly rare due to their complex habitat needs. Wood turtles also have become more scarce in Fairfield County due to the fragmentation of suitable habitat by urban development.

Range

Wood turtles can be found across the northeastern United States into parts of Canada. They range from Nova Scotia through New England, south into northern Virginia, and west through the Great Lakes region into Minnesota.

Description

The scientific name of the wood turtle, *Glyptemys insculpta*, refers to the deeply sculptured or chiseled pattern found on the carapace (top shell). This part of the shell is dark brown or black and may have an array of faint yellow lines radiating from the center of each chiseled, pyramid-like segment due to tannins and minerals accumulating between ridges. These segments of the carapace, as well as those of the plastron (bottom shell), are called scutes. The carapace also is keeled, with a noticeable ridge running from front to back. The plastron is yellow with large dark blotches in the outer corners of each scute. The black or dark brown head and upper limbs are contrasted by brighter pigments ranging from red and orange to a pale yellow on the throat and limb undersides. Orange hues are most typical for New England's wood turtles. The hind feet are only slightly webbed, and the tail is long and thick at the base. Adults weigh approximately 1.5 to 2.5 pounds and reach a length of 5 to 9 inches.

Habitat and Diet

Wood turtles use aquatic and terrestrial habitats at different times of the year. Their habitats include rivers and large streams, riparian forests (adjacent to rivers), wetlands, hayfields, and other early successional habitats. Terrestrial habitat that is usually within 1,000 feet of a suitable stream or river is most likely used. Preferred stream conditions include moderate flow, sandy or gravelly bottoms, and muddy banks.

Wood turtles are omnivorous and opportunistic. They are not picky eaters and will readily consume slugs, worms, tadpoles, insects, algae, wild fruits, leaves, grass, moss, and carrion.

Life History

From late spring to early fall, wood turtles can be found roaming their aquatic or terrestrial habitats. However, once temperatures drop in autumn, the turtles retreat to rivers and large streams for hibernation. The winter is spent underwater, often tucked away below undercut riverbanks within exposed tree roots. Dissolved oxygen is extracted from the water, allowing the turtle to remain submerged entirely until the arrival of spring. Once warmer weather sets in, the turtles will become increasingly more active, eventually leaving the water to begin foraging for food and searching for mates. Travel up or down stream is most likely, as turtles seldom stray very far from their riparian habitats.

Females nest in spring to early summer, depositing anywhere from 4 to 12 eggs into a nest dug out of soft soil, typically in sandy deposits along stream banks or other areas of loose soil. The eggs hatch in late summer or fall and the young turtles may either emerge or remain in the nest for winter hibernation. As soon as the young turtles hatch, they are on their own and receive no care from the adults.

Turtle eggs and hatchlings are heavily preyed upon by a wide variety of predators, ranging from raccoons to



birds and snakes. High rates of nest predation and hatchling mortality, paired with the lengthy amount of time it takes for wood turtles to reach sexual maturity, present a challenge to maintaining sustainable populations. Wood turtles live upwards of 40 to 60 years, possibly more.

Conservation Concerns

Loss and fragmentation of habitat are the greatest threats to wood turtles. Many remaining populations in Connecticut are low in numbers and isolated from one another by human-dominated landscapes. Turtles forced to venture farther and farther from appropriate habitat to find mates and nesting sites are more likely to be run over by cars, attacked by predators, or collected by people as pets.

Other sources of mortality include entanglements in litter and debris left behind by people, as well as strikes from mowing equipment used to maintain hayfields and other early successional habitats.

The wood turtle is imperiled throughout a large portion of its range and was placed under international trade regulatory protection through the Convention on International Trade in Endangered Species (CITES) in 1992. Wood turtles also have been included on the International Union for Conservation of Nature's (IUCN) Red List as a vulnerable species since 1996. They are listed as a species of special concern in Connecticut and protected by the Connecticut Endangered Species Act.

How You Can Help

- Conserve riparian habitat. Maintaining a buffer strip of natural vegetation (minimum of 100 feet) along the banks of streams and rivers will protect wood turtle habitat and also help improve the water quality of the stream system. Stream banks that are manicured (cleared of natural shrubby and herbaceous vegetation) or armored by rip rap or stone walls will not be used by wood turtles or most other wildlife species.
- Do not litter. Wood turtles and other wildlife may accidentally ingest or become entangled in garbage and die.
- Leave turtles in the wild. They should never be kept as pets. Whether collected singly or for the pet trade, turtles that are removed from the wild are no longer able to be a reproducing member of a population. Every turtle removed reduces the ability of the population to maintain itself.
- Never release a captive turtle into the wild. It probably would not survive, may not be native to the area, and could introduce diseases to wild populations.
- As you drive, watch out for turtles crossing the road. Turtles found crossing roads in June and July are often pregnant females. They should not be collected but can be helped on their way. Without creating a traffic hazard or compromising safety, drivers are encouraged to avoid running over turtles that are crossing roads. Also, still keeping safety precautions in mind, you may elect to pick up turtles from the road and move them onto the side in the direction they are headed. Never relocate a turtle to another area that is far from where you found it.
- Learn more about turtles and their conservation concerns, and educate others.
- If you see a wood turtle, leave it in the wild, take a photograph, record the location where it was seen, and contact the Connecticut DEEP Wildlife Division at deep.wildlife@ct.gov, or call 860-424-3011 to report your observation.



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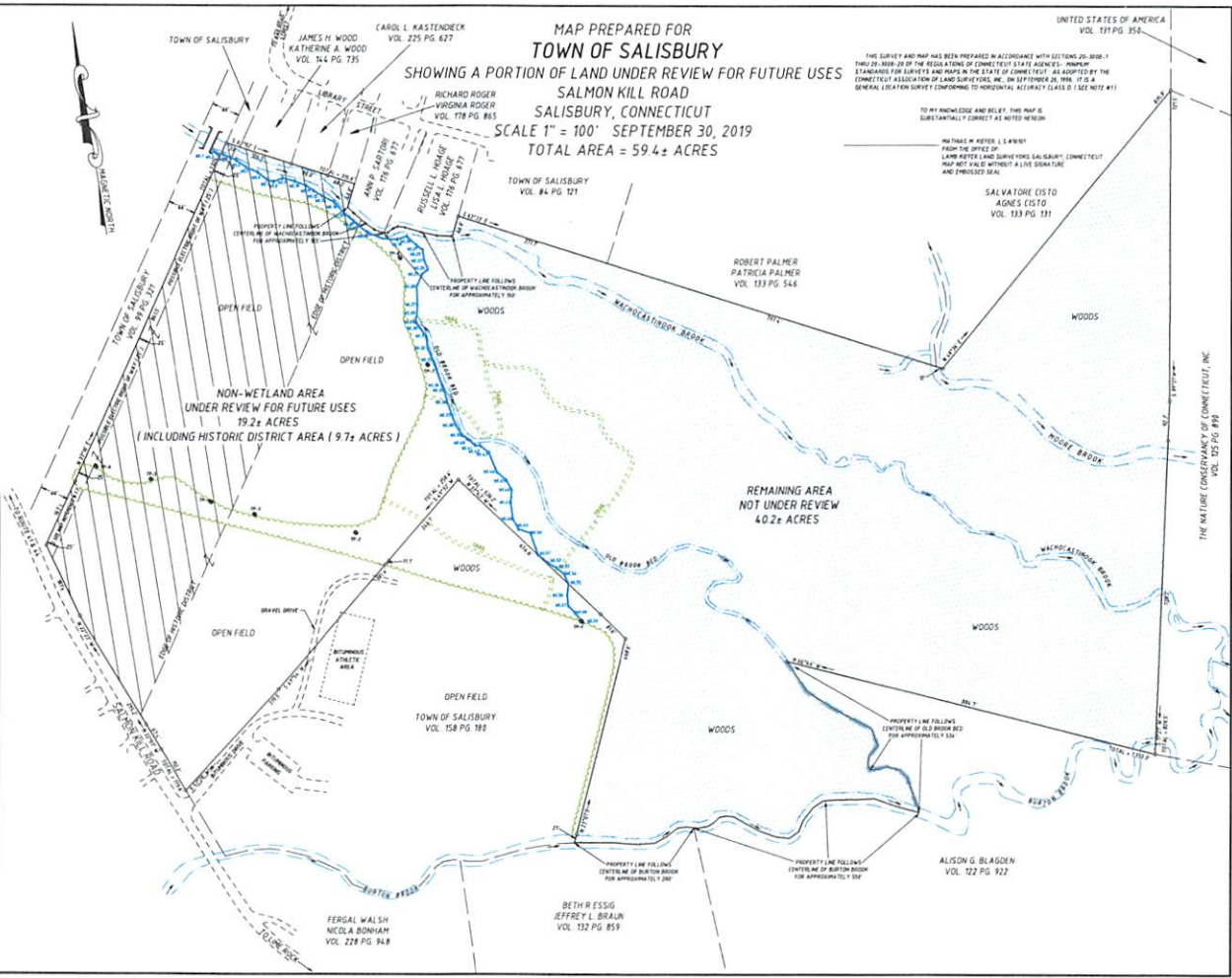
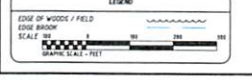


GENERAL NOTES

1. THIS MAP WAS PREPARED FROM RECORDS RECEIVED, OTHER MAPS, LIMITED FIELD MEASUREMENTS AND FIELD SURVEYS. IT IS NOT TO BE CONSIDERED AS A PROPERTY SURVEY UNLESS INDICATED OTHERWISE BY THE SURVEYOR'S SIGNATURE AND SEAL.
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MAP ADVISORIES

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8. TOWN OF SALISBURY RECORDS VOL. 184 PG. 335. 9. TOWN OF SALISBURY RECORDS VOL. 184 PG. 335. 10. TOWN OF SALISBURY RECORDS VOL. 184 PG. 335.
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10. TOWN OF SALISBURY RECORDS VOL. 184 PG. 335.



MAP PREPARED FOR
TOWN OF SALISBURY
 SHOWING A PORTION OF LAND UNDER REVIEW FOR FUTURE USES
 SALMON KILL ROAD
 SALISBURY, CONNECTICUT
 SCALE 1" = 100' SEPTEMBER 30, 2019
 TOTAL AREA = 59.4± ACRES

THE SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THROUGH 20-300B-3 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES - PLANNING STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT, AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 20, 1999. IT IS A GENERAL LOCATION SURVEY CONFORMING TO INDIVIDUAL ACCURACY CLASS 01 (SEE NOTE #1).

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

WITNESSED AT MY OFFICE OF LAND SURVEYORS AND SURVEYORS SALISBURY, CONNECTICUT, THIS 30TH DAY OF SEPTEMBER, 2019.

SALVATORE CISTO
 AGNES CISTO
 VOL. 133 PG. 131

ROBERT PALMER
 PATRICIA PALMER
 VOL. 133 PG. 146

BETH R. ESSIG
 JEFFREY L. BRAUN
 VOL. 132 PG. 859

NICLA BONHAM
 VOL. 128 PG. 948

FERGAL WALSH
 VOL. 128 PG. 948

ALISON G. BLAGDEN
 VOL. 122 PG. 927

THE NATURE CONSERVANCY OF CONNECTICUT, INC.
 VOL. 125 PG. 899