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December 11, 2023

VIA E-MAIL

Town of Salisbury  
Inland Wetlands Commission  
1 East Main Street  
Salisbury CT 06068

**ATTN:** Mr. Larry Burcroft, Chairman

**RE:**     **WETLANDS ASSESSMENT: Summary of Findings**  
          **Dresser Woods**, Railroad Street, Salisbury, CT

*REMA Job # 14-1729-SLS2*

Dear Mr. Burcroft and Commission members:

At the request of the applicant, the Salisbury Housing Committee, REMA ECOLOGICAL SERVICES, LLC (REMA), has prepared this *Wetlands Assessment* to be submitted as part of an application before the Town of Salisbury Inland Wetlands and Watercourses Commission. Our study area includes the northern on-site wetlands and the swath of habitat along Spruce Swamp Creek, just east of the site.

The Connecticut Inland Wetlands and Watercourses Act (CGS Sections 22a-36 to 22a-45) calls for consideration of potential impacts to downgradient regulated resources, as well as those on-site. Additionally, the wide-ranging Special Concern Wood Turtle (*Glyptemis insculpta*), a “Connecticut-listed” species, has been documented along this reach of Spruce Swamp Brook, per a letter from CTDEEP, dated July 15, 2022. Wood turtles’ terrestrial foraging habitat could encompass the subject property. The letter from CTDEEP calls for assessment of potential impacts to this turtle species and its habitat.



## **1.0 INTRODUCTION**

The applicant is proposing an affordable residential development with nine buildings and a total of twenty units on a 5.32-acre forested parcel within walking distance of the center of town. The project will be accessed from the south, from Railroad Street, and will also include 21 parking spaces and an overflow parking area with grassed pavers for 10 cars. Stormwater infrastructure will include seven rain gardens, and underground detention for flood storage. For this report, REMA reviewed a ten-sheet plan set prepared by Haley Ward, Inc., of Winsted, Connecticut, dated 11-20-23, and entitled “Salisbury Housing Committee, Dresser Woods, Railroad Street.” The plan includes an undisturbed 75-foot-wide Upland Review Area (URA), as well as a minimally disturbed 100-wide Vernal Pool Envelope (VPE) around the confirmed vernal pool habitats associated with the site’s delineated wetlands. No direct wetland impacts are proposed.

A broad swath of wetlands in the northern portion of the property drains easterly towards the creek. Off-site to the north and northeast is an approximately seven-acre hardwood forest, similar to the forest in the proposed development footprint. The south side of the site, to be developed, is a well-drained hardwood forest with gently undulating topography, an open understory. Penn sedge “lawn” covers much of the forest floor. Bordering the site, to the west is the abandoned Penn Central Railroad line, now used as a recreational trail. Route 44 is about one tenth mile to the west. East of the site is the Spruce Brook Creek riparian corridor, which includes an approximately 270-foot-wide forested buffer strip between the subject property and the creek, owned by the Salisbury Village Open Space Association.

This report describes the ecological communities and functions of the wetlands and the potential effects of the proposed activity, as required by the Town regulations. Wetland boundaries were delineated by Tom Pietras on January 13, 2014. George Logan first characterized wetlands and vernal pools in April of 2014 (see Attachment A). Sigrun Gadwa and George Logan revisited the site on May 13, 2022, October 13, 2022, and September 28, 2023. They characterized the flora, assessed wetland functions and revisited the vernal pool habitats.

For this report, REMA reviewed a variety of secondary source data, including archival aerial photographs, UConn CTECO Resource Maps, and Soil Survey State of Connecticut (USDA-NRCS) (attached), Streams Stats, and CT DEEP resource maps (e.g., surficial & bedrock geology).



Attached are several recent annotated photographs, of both the uplands to be developed and on-site and off-site regulated resources (see Photos 1 through 19, Attachment B).

## **2.0 OVERVIEW OF NATURAL RESOURCES**

### **2.1 LANDSCAPE SETTING, GEOLOGY & SOILS**

The site is in the lower portion of the large drainage basin of Spruce Swamp Creek. The basin has an area of 9.74 square miles upgradient of the Route 44 crossing, the USGS StreamStats analysis point (See Stream Stats Report in Attachment C). The basin includes several tributaries, e.g., Moore Brook, Brassie Brook, and Ball Brook, which drain the eastern and southern slopes of Bear Mountain and the northern flanks of Lions Head.

Bedrock in the forested western hillside terrain is acidic schist in the Everett and Walloomsac formations. Further downstream, the creek flows through a mosaic of woodland and farmland. More fertile soils are mostly underlain by Stockbridge marble. Bedrock beneath the project site is gray dolomitic marble, the Cse mapping Unit in the Bedrock Geology Map of Connecticut (Rodgers 1985)

Per USGS StreamStats, the watershed upstream of the Route 44 crossing, is only 4.24% developed, with a total of 22 miles of roads, and percent impervious surface is very low, at 0.4%, indicative of excellent water quality, suitable for wood turtle. However, where the Creek passes near the town center, along the 0.4 mile stretch between Route 44 and the site, there are some potential pollution sources including an approximately fifteen-acre apartment complex east of Route 44, to the east of the creek.

Soils have developed in surficial materials deposited by glacial meltwaters. The mapping unit on the Surficial Materials Map of Connecticut (Stone 1992) is “sand and gravel overlying fines, with a depth less than 20 feet.” A depth of 18 feet was measured close to the site. These materials originated in terrain to the northwest, traversed and scoured by glaciers. The glacial outwash at the site has much acidic rock parent material as well as marble material.

Per the USDA soils map soils series on the site are derived from a combination of schist, limestone and dolomite materials. The uplands soil series are the moderately well-drained Hero (22) gravelly loam, the well-drained Copake (31) fine sandy loam, and the excessively drained Groton (39) gravelly sandy loam. Soils are deep and well-drained to excessively



drained within the development area, per the deep test pit data, which showed no water, mottles, or confining layers. Wetland soils in the northern wetland corridor are poorly drained Fredon (14) silt loam, very poorly drained Halsey (16) silt loam, and very poorly drained Timakwa and Natchaug (17) mucks.

Vegetation composition at the site is consistent with the mixed origin of the soil series. The predominant herbs are species found in landscapes with soils derived from crystalline, acidic bedrock. However, some of the plant species are more typical of the calcium-enriched soils that develop over marble or basalt. The wetland lacks sphagnum mosses, and the overall good fertility is indicative of soil enrichment by calcium and other minerals.

## 2.2 WETLANDS

### 2.2.1 Classification

In the April 2014 wetlands report (Attachment A) three wetland units were described: Wetland Unit A (WA), WB1, and WB2, and vernal pool status was assessed. Findings during subsequent field investigations were fully consistent with the 2014 report. Their *hydrogeomorphic classification* changes, proceeding downgradient and easterly. In WA the smallest pool is a depression fed by surface water, only about eight feet by thirty feet, and dries up too soon to support vernal pool species other than fairy shrimp. In WB1 the middle pool is a depression fed both by surface water and by groundwater, and retains water past mid-summer, long enough for metamorphosis of many wood frogs. Likewise, WB2 has deep, ponded standing water, fed both by surface and groundwater, where spotted salamander egg masses were found in 2014. It also includes a broad swath of saturated, densely vegetated hillside, classified as groundwater slope.

PFO1 wetlands (palustrine, forested, broad-leaf deciduous), per the NWI classification, are important in all units. Red maples, sugar maples, and some black gums overhang the pools, though tree cover is less since three mature ashes have died. WB1, the middle wetland unit also has an open water/unconsolidated bottom (PUB3) component. This is Vernal Pool 2, which is about fifty feet by eighty feet, and up to 2.5 feet deep. Wetland Unit B2 includes embedded, flooded vernal pool habitat (VP3), shaded by low ironwood trees. It also has a substantial scrub shrub/emergent component (PSS/PEM), especially in the off-site portion to the east. The herb stratum is dense throughout this wetland, except in the flooded section.

### 2.2.2 Amphibians - Follow-up Vernal Pool Investigations





On May 13, 2021, seven years after the first survey, fairy shrimp were again observed in the smallest, westernmost pool, VP1. The water was only two inches deep, and the pool was about eight feet drawn down on all sides. A garter snake was in the pool, feeding on fairy shrimp. Fingernail clams were abundant.

The breeding wood frog population in Vernal Pool 2 was still robust. Tadpole densities were high - up to 25 in one sweep of the net. Three green frogs were also noted. On October 13<sup>th</sup>, 2023, half a dozen newly metamorphosed wood frogs, were hopping about on the south side of the pool, within 100-feet of vernal pool. Wood frog tadpoles, but no spotted salamander larvae were found in embedded Vernal Pool 3. This is not surprising as the larvae are cryptic and the population was small in 2014 (five egg masses)

### 2.2.3 Wetland Vegetation

Adjacent to the vernal pools, density of shrubs was low (including three invasive Japanese barberry bushes). Herbaceous plant cover vegetation was moderate. Water's edge species included Pennsylvania cress, skunk cabbage, clearweed, big-tooth sticktight (*Bidens cernua*), and a patch of swamp buttercup (*Ranunculus septentrionalis*). The shoreline zone had several fern species: Cinnamon fern, sensitive fern, and New York fern. One invasive herb, garlic mustard, had spread from the rail trail to the perimeter of Vernal Pool 1. Section 2.3 describes the diverse herbs in moderately drained soils on the terrace near the vernal pools.

Vegetation was dense and diverse in the non-flooded parts of the hillside wetland, sloping down to the creek (partly offsite). Shrubs, low trees, and saplings included ironwood, one living black ash, swamp rose, silky dogwood, elderberry, and speckled alder. A large, rhizomatous sedge patch (*Carex cf. utriculate*, not fruiting) bordered the flooded portion of Vernal Pool 3. Other herbs, shaded by ironwood, were tussock sedge, marsh fern, false nettle, hop sedge (*Carex lupulina*) and mild water pepper. Proceeding downhill, the tree canopy thinned, and the dense, 2-4-foot-tall forb stratum included lance leaf aster, stinging nettle, purple willowherb, and jewelweed, with occasional turtlehead, rough goldenrod (*Solidago packera*), water parsnip, fringed loosestrife, maddog skullcap, and native stinging nettle. We noted ragwort, *Packera obovata*, a showy, yellow wildflower of calcium-rich soils, also the larval host plant for the rare metalmark butterfly. Near the creek, seepage slope plants included



patches of hollow Joe Pye (*Euthrochia fistulosum*), moneywort (*Lysimachia nummularia*), and arrow tearthumb.

#### 2.2.4 Creek Habitat

This section of Spruce Swamp Creek is a low-gradient run, 28-35 feet wide. In early fall (mid-October) the creek averaged about ten inches deep. Banks are undercut in some areas and average about 18 inches high. The substrate consists of medium sand, with a few patches of fine sand and 1% to 2% cover of small gravel and a few small cobbles. Woody debris is sparse. One sediment bar was observed. The sandy, homogeneous in-stream habitat in the study reach is not a productive foraging habitat for fish or wood turtles. Available substrate for macroinvertebrates is low, as is the diversity of water depths and flow regimes. However, one stonefly (Plecoptera) and one mayfly (Ephemeroptera) were found under a plank, both these taxa are intolerant of polluted water, as are wood turtles. Water quality is presumed to be very good, based on the USGS Stream Stats analysis (Section 2.1 and Attachment ?), so other segments of this creek are expected to provide more productive aquatic habitat.

Red maples, sugar maples, ironwoods, and oak trees shaded the creek. Diversity of woody understory vegetation was low. Shrubs were witch hazel, ironwood, some spicebush, and frequent Japanese barberry. Herbaceous vegetation along the creek's edge included hooked buttercup, jumpseed, and golden ragwort as well as the group of species that was also common in the onsite seepage wetland: skunk cabbage, tussock sedge, clearweed, willowherb, and jewelweed.

#### 2.3 UPLANDS

The site's uplands occupy the southern and central portion of the property. They include the development envelope, and a buffer area along the perimeter of the proposed project. The moderately well-drained terrace around the vernal pool wetlands consists of forest with sugar maples, red maple, tupelo, and black birch. The shrub stratum is thin; it does have scattered Japanese barberry, expected to spread over time. The herb layer includes lady fern, snake root, heart-leaved aster, wild geranium, and seedlings of shadbush and maple-leaf viburnum. Hog peanut (*Apios americana*) was also common, a species characteristic of soils with high calcium levels.



Elsewhere the upland forest has well drained soils, with the gently undulating surface topography characteristic of undisturbed glacial outwash soils. Vegetation structure is similar throughout: a closed tree canopy, low-density woody understory, and a good mix of tree size classes, including over ten trees of 30-inch dbh, or greater. Species diversity is moderately high in all strata. Oaks include a substantial component of scarlet oak and red oak; sugar maple, tulip tree, sassafras, and black birch are also present. Spring-blooming downy shadbush (*Amelanchier arborea*) reaches small tree size. It is also common in the shrub stratum, which includes native hazelnut (*Corylus cornuta*), maple leaf viburnum, and witch hazel. Low ericaceous shrubs (lowbush blueberry and huckleberry) are present as small, scattered patches, but not dominant.

The herbaceous stratum has sizable areas with a continuous cover of native, fine-bladed, dense Pennsylvania sedge. The “lawns” of this very attractive rhizomatous species do not need mowing as they do not grow taller than four to six inches. Penn sedge is increasingly popular for native landscaping on shaded residential sites. Though difficult to start from seed, and slow to establish from plugs, it can readily be moved as “sod” onto a bed of salvaged suitable soil.<sup>1</sup> It does especially well on calcium-enriched and well-drained soils.

Other common herbs are hayscented fern and Christmas fern. Smooth sarsaparilla (*Aralia nudicaulis*) is also a robust groundcover. Wildflower species included wintergreen, partridgeberry, Canada mayflower, blue goldenrod, herbaceous Smilax, sweet bedstraw (*Galium triflorum*), false Solomon’s seal, anemone meadow-rue (*Thalictrum thalictroides*), and two species of bellwort, both *Uvularia sessifolia* and *U. perfoliatum* (the latter grows in sub-acidic soils). Leaving naturally vegetated “circles” around the fifteen mature trees to remain will preserve some of these wildflowers and will allow natural recycling of nutrients of leaves that fall into the circles.

Few invasive plant species are established on the site other than scattered Japanese barberry near the wetlands. Seedlings of burning bush were relatively common, but not mature shrubs. However, Japanese barberry is abundant in off-site creekside uplands bordering the Creek.

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<sup>1</sup> Earth Tones in Salisbury is qualified to move Penn sedge sod from one section of the site to a different area.



### **3.0 WETLAND FUNCTIONS AND VALUES**

In Connecticut a significant wetlands application calls for an assessment of wetland functions and values. Note that the section on upland habitat precedes this section on wetland functions because wetland functions are closely tied to adjacent upland characteristics. For this assessment, REMA has used a concise narrative version of USACOE Methodology (1995).

1. **Groundwater** recharge/discharge is a principal (or primary) function. Groundwater discharge into the pools helps maintain water depth for breeding amphibians in Vernal Pools. The pools and the seepage wetland discharge water laterally into adjacent moderately well-drained soils, irrigating trees and other vegetation.
2. **Flood storage** is a secondary function for the three vernal pools, especially during the summer and early fall draw-down period, when storage capacity is highest. They trap hillside runoff from adjacent higher-elevation forest during large storms when hillside soils are saturated. On the seepage slope of Wetland 2B, the dense vegetation and micro-topography slows down runoff and desynchronizes flood-flows. However, the absence of known, downstream flood-prone structures reduces the function's economic significance. During summer drawdowns, forest soils also have maximum water storage capacity, reducing the need for additional flood storage at that time of year.
3. **Bank stabilization** helps prevent sediment releases due to channel scour. Function is absent in Wetlands A1, and B1, as the pools are too small for waves to build up and erode banks, and water is not flowing. Defined banks are lacking in the seepage slope in WB2. This is a principal function in the off-site, downgradient creek, well-stabilized by vegetation.
4. **Sediment and toxicant trapping** is currently a minor secondary function as adjacent slopes are well-stabilized by roots and leaf litter and grades are not steep. If there were sediment and toxicant sources, the wetlands would function to trap them, but impairment would ensue.



5. **Nutrient removal and transformation** is a principal wetland function, throughout this system, by means of nutrient uptake by vegetation; denitrification in saturated organic rich soil; and transformation of nutrients in leaf litter into growing tadpoles.
6. **Production export.** This is also a principal function, and it is closely related to the previous one, though it focused on the production of food for wildlife by vegetation, including fruits, nuts, foliage, fairy shrimp, snails, clams, and tadpoles.
7. **Aquatic habitat.** The on-site pools provide aquatic habitat for snails, clams, fairy shrimp, and juvenile amphibians. This is a principal function. Aquatic habitat in Spruce Swamp Creek is not on-site, but the CT Inland Wetlands and Watercourses Act also requires consideration of potential downgradient impacts, e.g., impact to the nearby Creek. The sandy, low-gradient reach downgradient of the subject property has low to moderate quality habitat, unable to support abundant macroinvertebrates, but water quality should be very good, based on minimal watershed development. Aquatic habitat function is present, not principal.
8. **Wildlife Habitat.** This is a principal function. In addition to amphibian and invertebrate production by the vernal pools, food and cover provided by vegetation support a wide range of wildlife and insects. Documentation of this function by REMA began in 2013. Furthermore, wide-ranging wood turtles are known to reside in Spruce Swamp Creek. They also forage for invertebrates in terrestrial habitats up, both forests and fields, sometimes roving over 1,000 feet from their home watercourse.
9. **Endangered Species Habitat.** The wood turtle (*Glyptemis insculpta*) is a declining Species of Special Concern in the State. It hibernates in unpolluted perennial streams, and forages for aquatic invertebrates in spring and fall, but it also forages in terrestrial creekside habitat, both fields and wooded areas, during the growing season, sometimes moving over 1,000 feet from the home stream. Accordingly, it is *possible* that wood turtles may forage on this site during the growing season, in both uplands and wetlands.
- 10-12. **Human Use Values: Visual /Aesthetic Educational/Scientific, and Recreational.** Currently this site is not used by the general public or by scientists, though it has



been donated to the town. It is viewed by rail to trail users, passing by it. However, per the criteria of the USACOE Functional Assessment method, multiple characteristics of this site potentially contribute to a high rating (i.e., principal) for each the three categories of human use values: accessibility via the rail trail, an open understory, even walkable ground, fine mature trees, scenic Penn sedge lawns, diverse wildflowers, spring-blooming trees, lack of disturbance and vandalism, minimal invasives, and lack of safety hazards. The vernal pools are well suited to serve as outdoor classrooms, being centrally located in the town, near schools. They include a fairy shrimp pool as well as a productive wood frog pool, large enough to accommodate a sizable school group. With its high plant diversity and seepage-fed hydrology, Wetland B2 is well-suited to botanical study.

13. ***Uniqueness and Heritage Value.*** These wetlands, in their forested surroundings, do have a unique appeal, considering all the positive features described above. This value is present, but not principal. Adjacent wetlands, and the onsite upland forest lack unusual historic or geologic features. Though the site is scenic, undisturbed, and diverse, rare species are lacking, except for possible wood turtle, which has not been observed to date on the site. Not all the vernal pools are of Tier 1 quality, per important criteria in Calhoun & Klemens Best Development Practices (2002). At this location near the Salisbury town center, *less than fifty percent of the 750-foot wide, potentially +/-52-acre envelope of critical terrestrial habitat remains undeveloped.* There are only about fifteen acres of woods within the envelope, not including inaccessible forest east of Spruce Swamp Creek. Also, five spotted salamander egg masses were counted in 2013, indicating that the population is small.

#### **4.0 PROPOSED CONDITIONS – POTENTIAL IMPACTS**

No direct impacts to wetlands or watercourses are proposed, and proposed activities are also outside the town's 75-foot upland review, for wetlands and watercourses. Impacts are limited to potential indirect effects on the regulated resources. Potential indirect impacts will be analyzed systematically for each of the thirteen wetland functions/values set forth in the US Army Corps Highway Methodology (1995).





#### 4.1 IMPACTS TO WETLAND FUNCTIONS AND VALUES

##### Function 1. Groundwater Recharge/Discharge

Impacts to hydrology can be a serious problem when development occurs near vernal pools. The stormwater management system for this project will capture and filter most of the rainfall, from impervious surfaces before discharge via level spreaders, thus maintaining the groundwater discharge function that helps fill the pools; in particular the four raingardens just south of the wetland system will discharge groundwater towards the wetlands. Soils are well-drained, deep., and pervious. The overflow parking area will have pervious grass pavers. Hydroperiods for vernal pool amphibians are not expected to diminish.

##### Function 2. Flood storage

This is also expected to continue unchanged. The pools will continue to provide flood storage volume, especially during the summer drawdown. Dense wetland vegetation will continue to slow downhill runoff.

##### Function 3. Bank Stabilization

Bank vegetation and soils along the downgradient watercourse, Spruce Swamp Creek, will not be subject to additional scour because the stormwater management system has been designed to prevent increased flow volumes and velocities in the creek; in particular, the underground storage tanks will protect this function during larger storms.

##### Function 4. Sediment and Toxicant Trapping.

The need for this function will not increase, since minimal sediment losses and toxicant releases during/after construction are anticipated. Slopes are gentle on the site. Buffer soils are permeable, such that the fines in runoff that passes through perimeter barriers during the construction phase are expected to be filtered through infiltration. Moreover, the gradient of the terrain is easterly, not northerly, towards the vernal pool. The distance easterly to the creek from the property line will average about 270 feet.

The naturally vegetated setback from the sediment barrier to the vernal pool wetlands will be 75 feet, and minimally disturbed setback will extend the full 100 feet. We do suggest use of



well-decomposed compost in the proposed filter socks, rather than mulch, adjacent to the wetlands, for more effective trapping of nutrients associated with the fine sediment fraction, as documented by USDA-NRCS research (2011).

Increased toxicant or bacteria loading to wetlands and to the creek is not expected. The project is sewered. Even before the state-of-the Art Focal Point Treatment, with only twenty units, loading of roadway pollutants will be very low, due to very limited “axle-miles” or the movements of vehicles over impervious surfaces. Site design minimizes roadway length and impervious surfaces.

***Functions 5 and 6. Nutrient Uptake/Transformation and Production Export***

Positive impacts to both these functions will result from the proposed woody shrub planting around the wetland pools, as shown on the submitted plans. Vegetation uptake of nutrients will increase, as will production of fruit, nectar, and foliage for wildlife. These plantings, and the other plantings within the development will help compensate for lost nutrient uptake and habitat within the project<sup>2</sup>. Though not regulated, upland trees with deep tap roots also extract nutrients from groundwater. Saving fifteen mature trees within the development will reduce the extent of the loss of nutrient uptake resulting from the project. These trees will continue to provide more food for wildlife, pollinators, and for leaf-eating insects.

A potential adverse impact to both these functions relates to the transformation of leaf litter nutrients to tadpole biomass. Reduced tadpole abundance due to decreased available terrestrial forested habitat and increased traffic levels would lessen both nitrogen transformation and the wildlife food supply (Wetland Functions 5 & 6). Loss of terrestrial habitat would also potentially have a negative impact on the Aquatic and Wildlife Habitat Functions 7 & 8). Refer to the following section for an analysis of this potential impact.

***Functions 7 and 8. Aquatic and Wildlife Habitat Support Functions***

It is highly unlikely that adverse impacts to aquatic life in the Vernal Pool wetlands will result from increased inputs of pollutants, toxicants, and/or sediment. Pollutant and sediment loading is expected to be negligible as discussed above. The gently sloping buffer to the creek is over 250 feet wide.

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<sup>2</sup> REMA would also recommend the eradication of the scattered Japanese barberry on the property.



### Diminished Terrestrial Habitat

However, habitat loss associated with land clearing is an unavoidable consequence of land development and has the potential to impact wetlands and watercourses. The spotted salamander population was already very small in 2013, based on egg mass counts, but the currently robust wood frog populations could decline, some extent, after the project is built, due to loss of roughly 2.5 acres of terrestrial wood frog habitat to the south of the vernal pools. However, this falls under the category of potential ecological impacts, not wetland impacts, since no physical impacts to the regulated resources is expected, even with a modest diminution of the wood frog population.

The available summer food supply for wood turtles will diminish, but for such a wide-ranging species, this loss is likely an insignificant fraction of the total available undeveloped habitat along this creek. The scientific literature on vernal pools includes several studies which demonstrate that vernal pool amphibians can move very long distances from breeding pools (over 1,200 feet for wood frogs). These studies also show that preserving only a 100 to 150-foot forested envelope may not be sufficient to sustain populations long-term (e.g. Windmiller et al 2005, Calhoun & DeMaynadier 2008, Rittenhouse & Semlitch 2007). However, exceptions to this general understanding do exist, as REMA has surveyed several “wood frog” vernal pools that persist with robust populations, even when nearly 50% of the critical terrestrial habitat (CTH) is developed.

Nevertheless, the Calhoun & Klemens Best Development Practices recommend leaving at least 75% of suitable terrestrial habitat between 100 and 750 feet from the pool. Increased road-kill hazards are also a potential impact, not only for wood frogs and salamanders, but also for wood turtles.

Fortunately, at this site, about 12.2 acres of existing mixed deciduous forest will continue to be available to wood frogs post-construction in the 100 to 750-foot-wide terrestrial envelope. Similar hardwood forest to that on the site extends 750 feet to the north and northeast of the wetland corridor, with a total of about 8.1 contiguous acres. This includes about 1.5 acres on-site, along the north side of the pools. This forested block extends easterly to Spruce Swamp Creek. Southeast of Wetland 2B (Vernal Pool 3) a protected swath of forest extends easterly and southeasterly from the site to the creek. Its width averages 270 feet, with an area of about



1.5 acres. This land to the west of the creek is protected, owned by the Salisbury Village Open Space Association. To the south of the site, and to the west of the rail trail some of the land has been residentially developed for decades, but a roughly 1.9-acre woodlot remains undeveloped. Wood frogs will be able to cross the trail embankment. Land east of the creek is not generally accessible to vernal pool amphibians. Of the existing roughly fifteen acres of deciduous forest within 750 feet of the vernal pools, the proposed project will impact about 2.5 acres (<20%).

Our professional opinion is that wood frog numbers will drop initially, as familiar terrestrial habitat just to the south of the pools becomes unavailable, but that wood frog numbers will partially recover, as young individuals make increasing use of the remaining available habitat to the north and southeast, and more egg masses are laid on the north side of the pool. Less terrestrial wood frog habitat will be lost if the outer zone of this residential community, where existing mature trees will be preserved, can also retain natural ground covers like Penn sedge, leaf litter, native wildflowers, and woody debris. This would create a broader corridor from the south sides of the pools, to access available terrestrial habitat to the southeast.

### Roadkill Risks

Other considerations, pertinent to wood frogs, spotted salamanders and wood turtles are the risks of crushing by construction equipment, and the extent to which roadkill will increase, post construction. Current plans call for use of filter socks for erosion control they will need to be supplemented or replaced by silt fence, because CTDEEP typically mandates use of exclusionary silt fence all around the perimeter of the construction site to keep out possible state-listed wood turtles, but also other wildlife. This perimeter silt fence will need to be tied into the eastern and western ends of the wildlife exclusion fence shown on the plan adjacent to the wetlands.

The existing roadkill risk is very low. The rail trail to the north is free of vehicular traffic will continue so post-construction. The eight acres of forest to the north of the wetland corridor is roadless as is the wooded buffer between the creek and the property. The proposed road layout, with rings of closely spaced building deters wood frogs and possibly wood turtles or other wildlife from entering the hazardous parking areas. The layout minimizes road length and reduces the likelihood of road mortality. The road enters the northwestern corner of the site, as far removed from the vernal pools and the creek as possible. Parking is at the center of a



circle of six buildings. A short spur connects to the remaining four buildings, which also surround a parking area. Cape cod curbs will be used so that small wildlife will not be trapped on roads.

### Decoy Pools

Decoy pools are another consideration; amphibians may lay eggs in flooded stormwater ponds. This project lacks stormwater ponds, and raingardens will be flooded for too short a period to become decoy vernal pools.

The plans need a detail for the wildlife exclusion fence. We suggest that this fence, valuable during construction, be moved further up the slope either to the south or to the north side of the rain gardens, after the rain gardens are vegetated and the construction site is stabilized, so that this suitable moist habitat will be available for recent amphibian metamorphs and other wildlife, enhancing the wetland corridor. After the fence is moved the vernal pool envelope will be at closer to being 100-feet wide, as specified in Calhoun & Klemens (2002) Best Development Practices, rather than the current 75-foot width. However, the exclusionary fence should remain to the north of Rain Rarden 5, with a nearby driveway. As noted above, to be effective during construction, the fence should be securely tied into the construction silt fence along the perimeter of the construction site.

### Values 9-11. Impacts to Human Use Values: aesthetic, educational/scientific, recreational.

On the one hand nearby buildings, parking lots, etc. will diminish aesthetic value and the quality of recreation for those walking past on the rail trail. On the other hand, many more people, namely future residents, will have the opportunity to walk and explore nature along this nature corridor, and to enjoy birdsong and the spring amphibian choruses. With better access and parking, nature education programs or academic studies are more likely to take place, post-construction, though permission from the property owner (s) will still be needed.

### Value 12. Impacts to Uniqueness and Heritage Value

This residential project could become a showcase with true heritage value, after implementation of its various ecologically sensitive features, assuming the vernal pools remain viable. The project could also demonstrate that mature trees can be incorporated into a multifamily residential project.



## **5.0 CONCLUSION**

In our professional opinion the proposal represents the feasible and prudent alternative with regard to potential indirect long-term impacts to wetlands and watercourses. There will be no direct impacts to the regulated resources, nor any indirect physical impacts, such as to wetland hydrology or water quality. Proposed setbacks to the regulated resources, site layout, and stormwater management design are such as to minimize or eliminate adverse impacts to the functions and values of the site's regulated wetlands, or to off-site, downgradient regulated resources, including Cedar Swamp Creek. Finally, there is a reasonable likelihood that vernal pool habitat will persist long term – a key feature of the wildlife support function.

Please call us if you have any questions on the above.

Respectfully submitted,

**REMA ECOLOGICAL SERVICES, LLC**

George T. Logan, MS, PWS, CSE  
Professional Wetland Scientist  
Registered Soil Scientist  
Certified Senior Ecologist

Sigrun N. Gadwa, MS, PWS  
Ecologist, Registered Soil Scientist  
Professional Wetland Scientist

Attachments: A: REMA April 2014 Report  
B: Annotated Photos (1 to 19)  
C: USGS StreamStats Report

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## **References**

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## **Attachment A**

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### REMA April 2014 Vernal Pool Survey Report



- Ecology
- Soil & Wetland Studies
- Water Quality Monitoring • GPS
- Environmental Planning & Management
- Ecological Restoration & Habitat Mitigation
- Aquatic, Wildlife and Listed Species Surveys
- Application Reviews • Permitting & Compliance

June 25, 2014

Mr. James V. Dresser, Jr.  
1 East Main Street  
Salisbury, CT 06068

**RE: VERNAL POOL INVESTIGATION/WETLAND CHARACTERIZATION**

**+/- 5.137-acre parcel**

Off of Railroad Street, Salisbury, CT

*REMA Job No.: 14-1729-SLS2*

Dear Mr. Dresser:

At your request, on April 19<sup>th</sup>, 2014, REMA Ecological Services, LLC (REMA) conducted a field investigation at the above-referenced parcel to inventory wetlands, previously flagged by Mr. Thomas Pietras, Certified Professional Wetland Scientist, and surveyed and plotted on a plan by Mr. Mathias Kiefer, Licensed Land Surveyor. The main objectives of the investigation were to inventory the wetlands for the presence of breeding vernal pool-type obligate amphibians, as well as to inventory and characterize the wetland areas associated with the parcel.

Attached to this report we provide a *Wetland/Watercourse Delineation & Characterization Field Form* for each of the three vernal pool habitats/wetlands observed at the site, followed by representative annotated photographs. We also attach several figures, including aerial photographs, to illustrate the wetland habitats. Finally, we include the Connecticut Soil Survey of the site, showing both upland and wetland soil types.

Following, we briefly provide some our findings:

1. There are three (3) vernal pool habitats associated with the parcel (see Figure A, attached). The smallest one (i.e. VP#1) only contains a vernal pool obligate invertebrate, the fairy

---

**Vernal Pool/ Wetland Investigation**

**RE:** +/- 5.317-acre parcel, Salisbury, CT

June 25, 2014

Page 2



shrimp (*Eubrachipus* sp.). Vernal Pools #2 and #3 contain an abundant breeding population of wood frog (*Lithobates sylvaticus*), based on over 287 egg masses. Vernal Pool #3, which is embedded in a larger wooded and scrub shrub swamp, also contained a few (i.e., five) spotted salamander (*Ambystoma maculatum*) egg masses.

2. Based on the abundance of wood frog egg masses and the relative scarcity of spotted salamander egg masses, and also based upon the apparent hydrologic regimes and soil types associated with the vernal pool habitats, the hydroperiod is not likely long enough for the emergence of spotted salamander neonates. Moreover, it is likely that the vernal pool habitats are acting as ecological sinks for spotted salamanders, which have perhaps dispersed here from other nearby vernal pools with a more favorable hydroperiod.
3. Vernal Pool #1, likely dries up too soon in the spring of a normal precipitation year to be suitable habitat for wood frogs. Fairy shrimp can thrive in such marginal habitats.

Please feel free to contact us with any questions on the above.

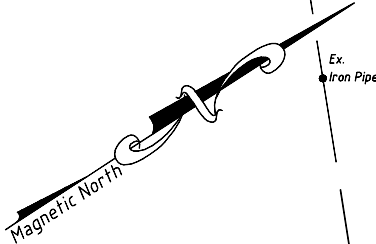
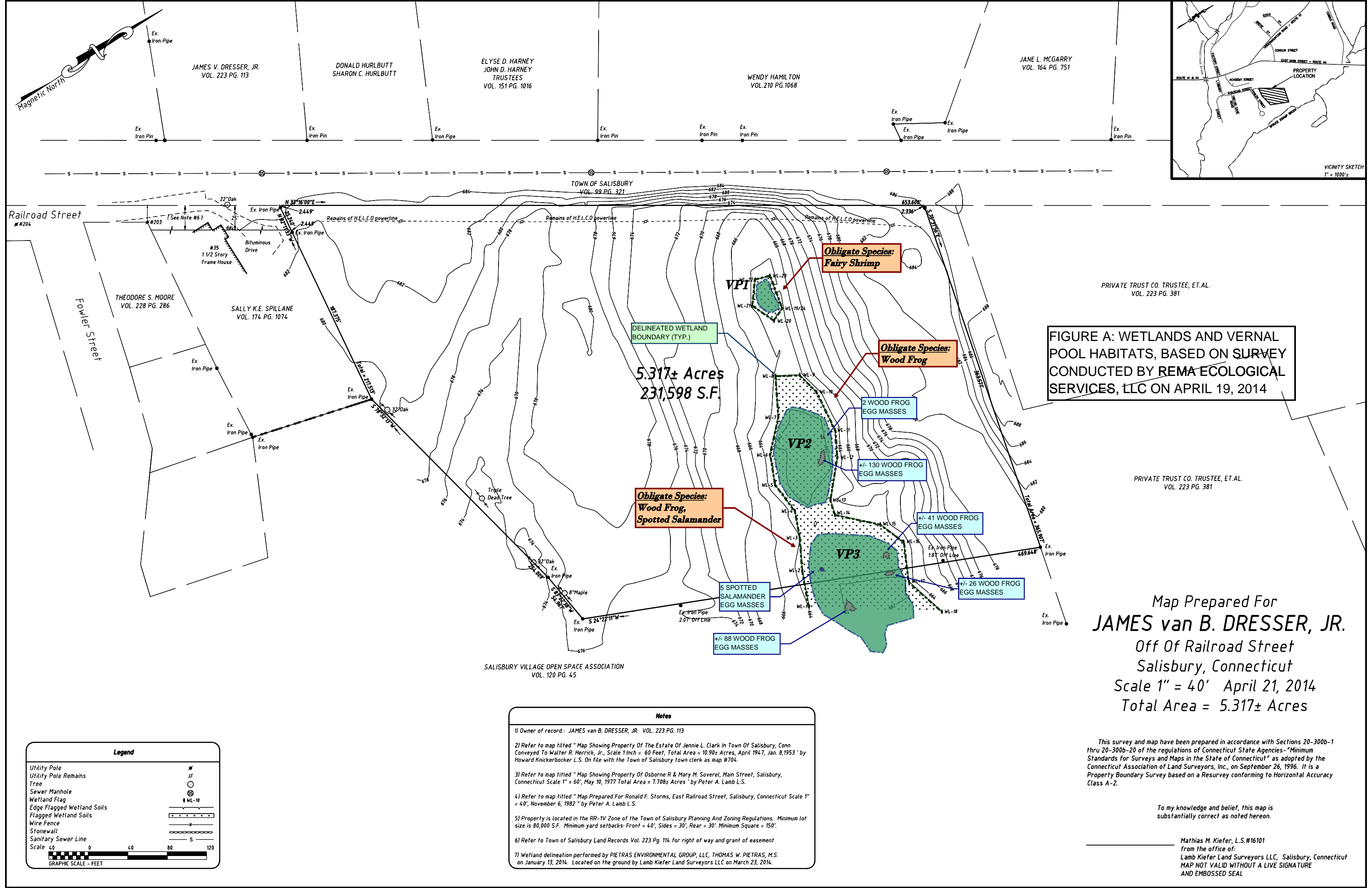
Respectfully submitted,

**REMA ECOLOGICAL SERVICES, LLC**

George T. Logan, MS, PWS, CE  
Professional Wetland Scientist/Registered Soil Scientist  
Wildlife Biologist

**VIA E-MAIL**

Attachments: Figures A, 1, 2 and 3; Wetland/Watercourse Characterization Forms, Annotated photographs, web soils survey, Wetland Classification/Characterization Definitions



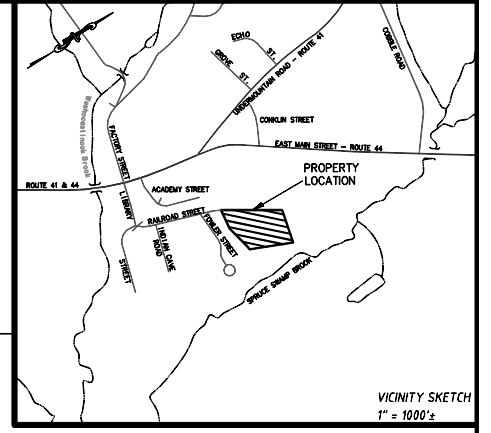
JAMES V. DRESSER, JR.  
VOL. 223 PG. 113

DONALD HURLBUTT  
SHARON C. HURLBUTT

ELYSE D. HARNEY  
JOHN D. HARNEY  
TRUSTEES  
VOL. 151 PG. 1016

WENDY HAMILTON  
VOL. 210 PG. 1068

JANE L. MCGARRY  
VOL. 164 PG. 751



Railroad Street  
#204

Fowler Street

THEODORE S. MOORE  
VOL. 228 PG. 286

SALLY K.E. SPILLANE  
VOL. 174 PG. 1074

TOWN OF SALISBURY  
VOL. 99 PG. 321

5.317± Acres  
231,598 S.F.

Obligate Species:  
Wood Frog,  
Spotted Salamander

Obligate Species:  
Fairy Shrimp

Obligate Species:  
Wood Frog

2 WOOD FROG  
EGG MASSES

+/- 130 WOOD FROG  
EGG MASSES

+/- 41 WOOD FROG  
EGG MASSES

+/- 26 WOOD FROG  
EGG MASSES

5 SPOTTED  
SALAMANDER  
EGG MASSES

+/- 88 WOOD FROG  
EGG MASSES

PRIVATE TRUST CO. TRUSTEE, ET.AL.  
VOL. 223 PG. 381

FIGURE A: WETLANDS AND VERNAL  
POOL HABITATS, BASED ON SURVEY  
CONDUCTED BY REMA ECOLOGICAL  
SERVICES, LLC ON APRIL 19, 2014

PRIVATE TRUST CO. TRUSTEE, ET.AL.  
VOL. 223 PG. 381

Map Prepared For  
**JAMES van B. DRESSER, JR.**  
Off Of Railroad Street  
Salisbury, Connecticut  
Scale 1" = 40' April 21, 2014  
Total Area = 5.317± Acres

This survey and map have been prepared in accordance with Sections 20-300b-1 thru 20-300b-20 of the regulations of Connecticut State Agencies-"Minimum Standards for Surveys and Maps in the State of Connecticut" as adopted by the Connecticut Association of Land Surveyors, Inc., on September 26, 1996. It is a Property Boundary Survey based on a Resurvey conforming to Horizontal Accuracy Class A-2.

To my knowledge and belief, this map is  
substantially correct as noted herein.

Mathias M. Kiefer, L.S.#16101  
from the office of:  
Lamb Kiefer Land Surveyors LLC, Salisbury, Connecticut  
MAP NOT VALID WITHOUT A LIVE SIGNATURE  
AND EMBOSSED SEAL

**Legend**

- Utility Pole
- Utility Pole Remains
- Tree
- Sewer Manhole
- Wetland Flag
- Edge Flagged Wetland Soils
- Flagged Wetland Soils
- Wire Fence
- Stonewall
- Sanitary Sewer Line

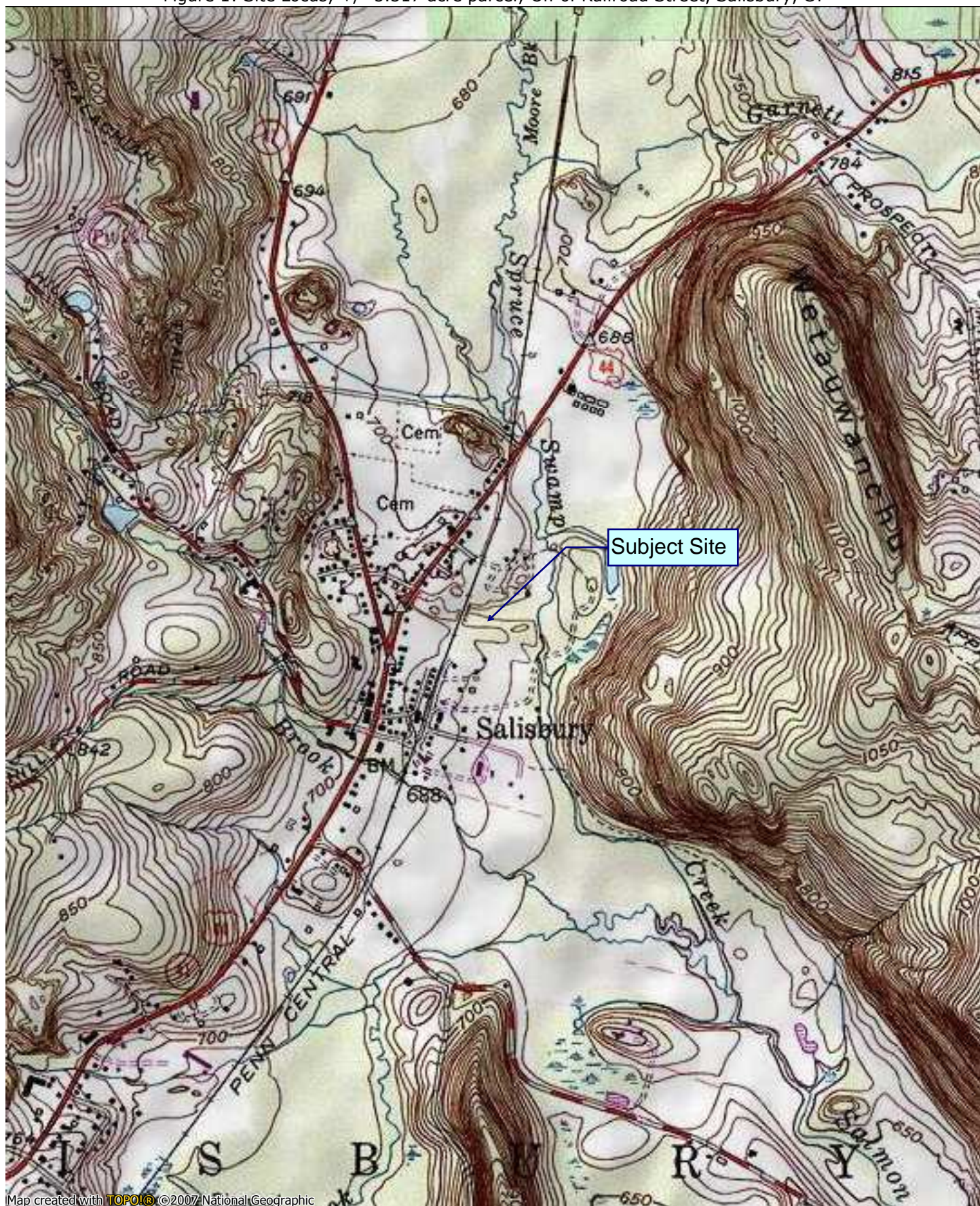
Scale 0 40 80 120  
GRAPHIC SCALE - FEET

**Notes**

- 1) Owner of record - JAMES van B. DRESSER, JR. VOL. 223 PG. 113
- 2) Refer to map titled "Map Showing Property Of The Estate Of Jennie L. Clark In Town Of Salisbury, Conn Conveyed To Walter R. Herrick, Jr., Scale 1 Inch = 60 Feet, Total Area = 10.90± Acres, April 1947, Jan. 8, 1953" by Howard Knickerbocker L.S. On file with the Town of Salisbury town clerk as map #704.
- 3) Refer to map titled "Map Showing Property Of Osborne R & Mary M. Soverel, Main Street, Salisbury, Connecticut Scale 1" = 60', May 10, 1977 Total Area = 7.708± Acres" by Peter A. Lamb L.S.
- 4) Refer to map titled "Map Prepared For Ronald F. Storms, East Railroad Street, Salisbury, Connecticut Scale 1" = 40', November 6, 1982" by Peter A. Lamb L.S.
- 5) Property is located in the RR-IV Zone of the Town of Salisbury Planning And Zoning Regulations. Minimum lot size is 80,000 S.F. Minimum yard setbacks: Front = 40', Sides = 30', Rear = 30'. Minimum Square = 150'.
- 6) Refer to Town of Salisbury Land Records Vol. 223 Pg. 114 for right of way and grant of easement.
- 7) Wetland delineation performed by PIETRAS ENVIRONMENTAL GROUP, LLC, THOMAS W. PIETRAS, M.S. on January 13, 2014. Located on the ground by Lamb Kiefer Land Surveyors LLC on March 23, 2014.



Figure 1: Site Locus; +/- 5.317 acre parcel; Off of Railroad Street, Salisbury, CT



Map created with **TOPOIC** ©2007 National Geographic



0.0 0.1 0.2 0.3 0.4 0.5 miles  
0.0 0.5 km

MN \* T  
13½°  
06/25/14





FIGURE 2: +/- 5.317-acre parcel, off of Railroad Street, Salisbury, CT, as seen on a CT DEEP 2004 aerial



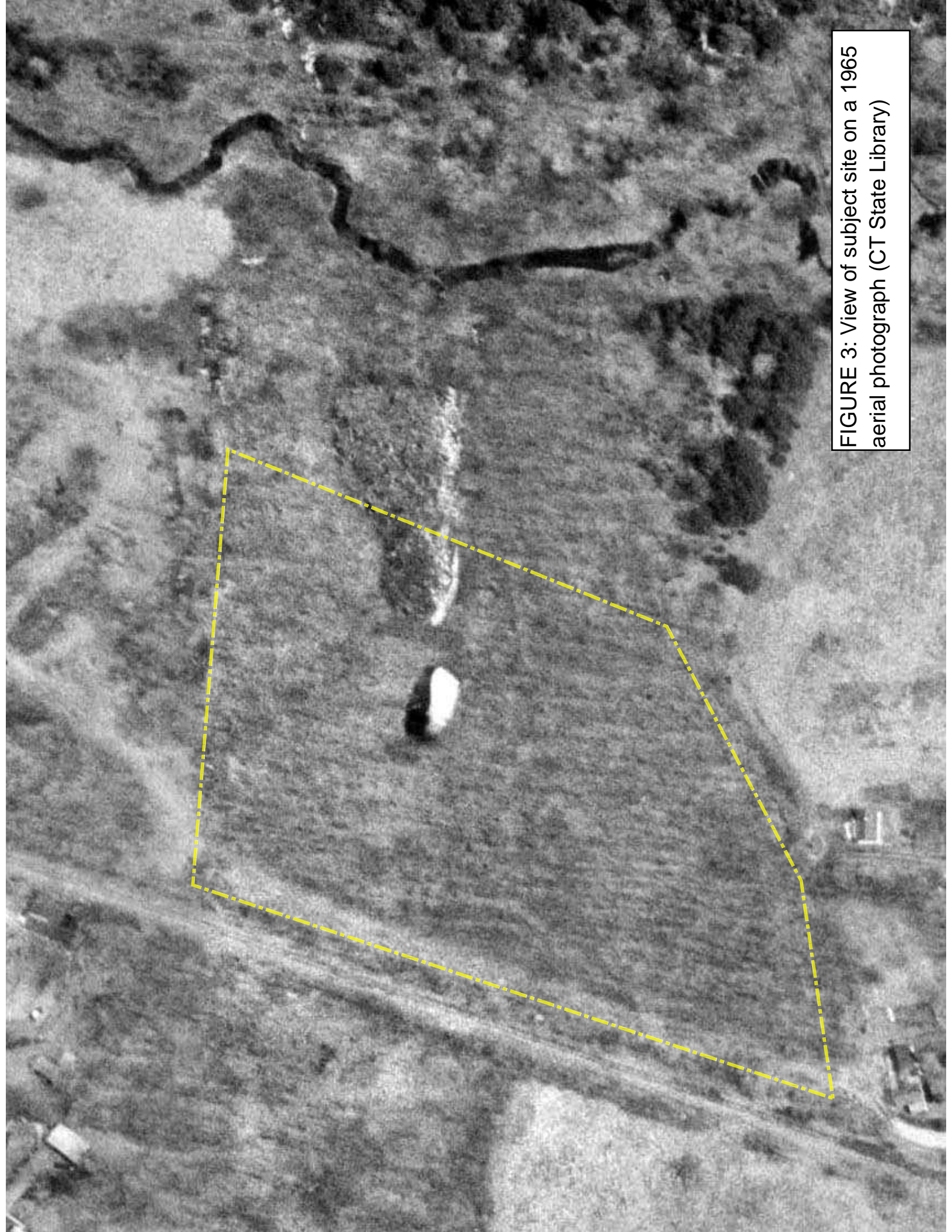


FIGURE 3: View of subject site on a 1965  
aerial photograph (CT State Library)





*Photo 1: Vernal Pool #1; facing southeasterly*



*Photo 2: Vernal Pool #1 only contained fairy shrimp as an obligate species.*





*Photo 3: Vernal Pool #2; facing westerly*



*Photo 4: Vernal Pool #2; wetlands in foreground; facing easterly*





*Photo 5: Vernal Pool #2; diffuse outlet during spring high water; facing westerly*



*Photo 6: Vernal Pool #2; diffuse outlet/overflow to Vernal Pool #3 (and swamp); facing southerly*





*Photo 7: Vernal Pool #2; only about 3-5 inches of water over leaf litter over organics; facing easterly*



*Photo 8: Vernal Pool #2; 3 to 4 feet of organics are typical; this was likely an old "ice pond" that has filled in over the years*





*Photo 9:* Primary productivity is high in Vernal Pool #2; thousands of snails (*Physa* spp.) seen grazing on leaf litter



*Photo 10:* Vernal Pool #2; *Physa* snail grazing algae on leaf litter in just 2-3 inches of water.

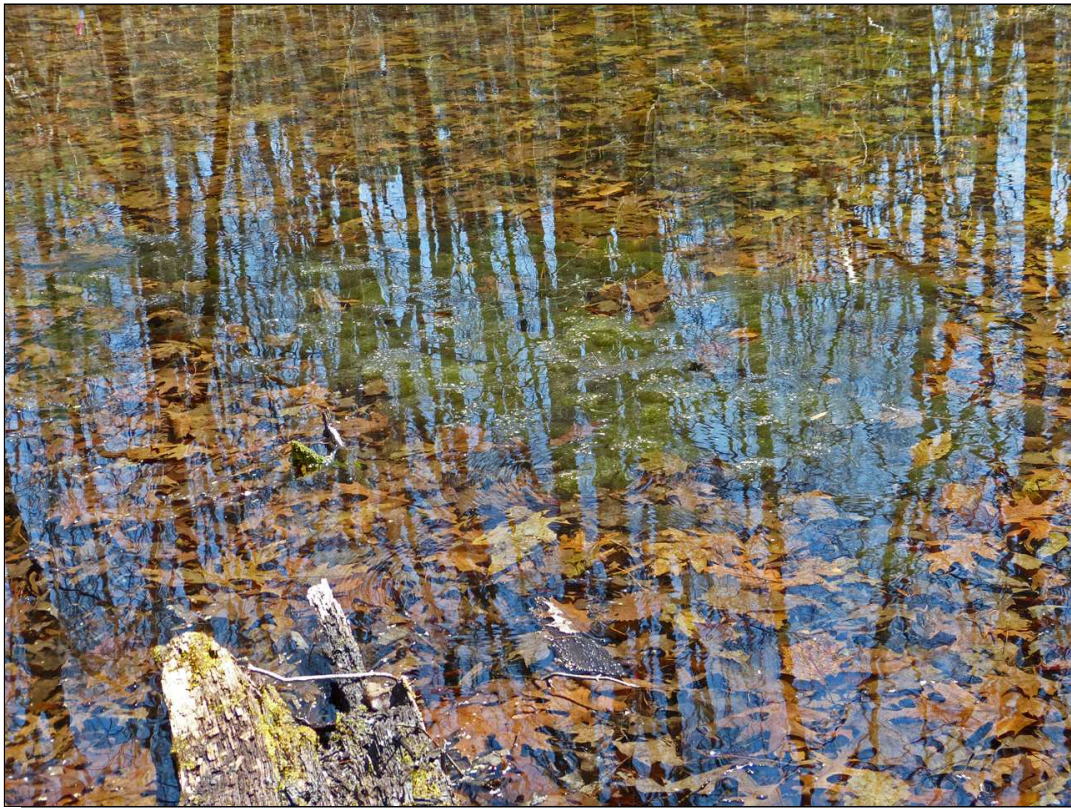


Photo 11: A mayfly (family Batidae) grazing on leaf litter within Vernal Pool #2; an indication that water persists through most if not all of the season



Photo 12: Vernal Pool #2; one of several aquatic plants, likely *Ranunculus flabellaris* (a buttercup) found here; too early in season to identify





*Photo 13:* Vernal Pool #2; a large (+/- 130) wood frog egg mass raft in oly 3-5 inches of water

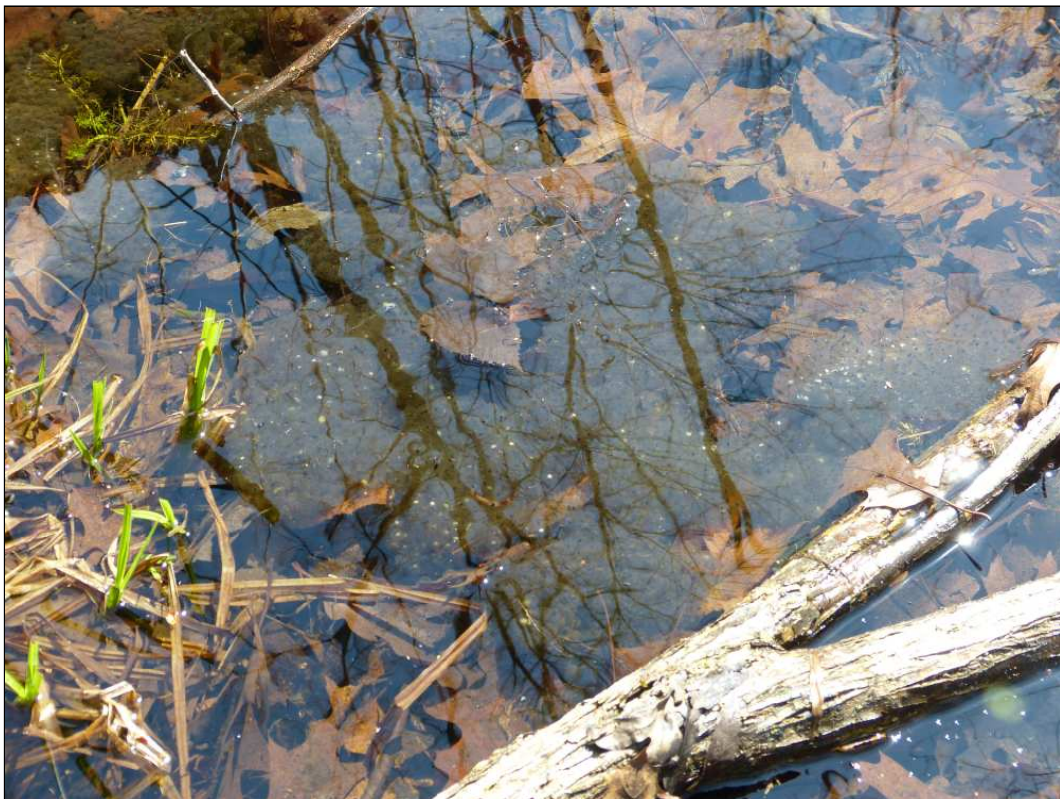


*Photo 14:* Vernal Pool #3; partially off-site; with embedded vernal pool type habitat; facing southerly





*Photo 15: Vernal Pool #3; view from the west; overflow from Vernal Pool #3 in forefront to the left*



*Photo 16: Vernal Pool #3; one of three wood frog egg mass rafts in only a few inches of water.*





*Photo 17: Vernal Pool #3; Spotted Salamander egg masses; the only found in the 3-pool cluster, indicating marginal hydrology for this species.*



*Photo 18: Spruce Swamp Creek to the east of site; site's wetlands drain here; coloration of water due to limestone/marble/schist bedrock geology of area.*

## Wetland/Watercourse Delineation &amp; Characterization Field Form

|  |  |
|--|--|
| <b>Project:</b> <i>+/- 5.317-acres, off of Railroad St., Salisbury, CT</i> | <b>Wetland ID:</b> <b>WA (VP#1)</b>                |
| Inspection Date: <i>4/19/14</i>  | Wetland Flag Series: <i>WL-19/WL-24</i>            |
| Inspector(s): <i>G. Logan</i>  | NWI Classification Codes: <sup>1</sup> <b>PFO1</b> |

|  |                               |
|--|-------------------------------|
| Weather/Field Conditions: <i>Sunny, 50s</i>  | Snow/Frost Depth: <i>none</i> |
| Soil Moisture: <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry                                |                               |
| Type of Wetland Delineation: <input checked="" type="checkbox"/> State <input type="checkbox"/> Federal <input type="checkbox"/> Other |                               |

**HGM Classification**

|  |  |
|--|--|
| <input type="checkbox"/> Surface Water Slope | <input checked="" type="checkbox"/> Surface Water Depression |
| <input type="checkbox"/> Groundwater Slope   | <input type="checkbox"/> Groundwater Depression              |

**NWI Classification****System:**

|  |                                     |                                   |                                    |
|--|-------------------------------------|-----------------------------------|------------------------------------|
| <input checked="" type="checkbox"/> Palustrine | <input type="checkbox"/> Lacustrine | <input type="checkbox"/> Riverine | <input type="checkbox"/> Estuarine |
|--|-------------------------------------|-----------------------------------|------------------------------------|

**Class:**

|  |  |   |
|--|--|---|
| <input checked="" type="checkbox"/> Forested | <input type="checkbox"/> Scrub Shrub           | <input type="checkbox"/> Emergent             |
| <input type="checkbox"/> Aquatic Bed         | <input type="checkbox"/> Unconsolidated Bottom | <input type="checkbox"/> Unconsolidated Shore |

**Subclass:**

|  |  |                                     |
|--|--|-------------------------------------|
| <input checked="" type="checkbox"/> Broad-leaved deciduous | <input type="checkbox"/> Needle-leaved evergreen | <input type="checkbox"/> Persistent |
| <input type="checkbox"/> Non-persistent                    | <input type="checkbox"/> Sand                    | <input type="checkbox"/> Mud        |
| <input type="checkbox"/> Other: _____                      |  |                                     |

**Wetland Hydrology**

|  |  |   |
|--|--|---|
| <input checked="" type="checkbox"/> Seasonally Flooded | <input type="checkbox"/> Temporarily Flooded | <input type="checkbox"/> Semi-permanently Flooded |
| <input type="checkbox"/> Seasonally Saturated          | <input type="checkbox"/> Saturated           | <input type="checkbox"/> Permanently Flooded      |

**Watercourse Type**

|                                       |                                    |                                |
|---------------------------------------|------------------------------------|--------------------------------|
| <input type="checkbox"/> Intermittent | <input type="checkbox"/> Perennial | <input type="checkbox"/> Tidal |
| Comments:                             |                                    |                                |

**Special Aquatic Habitat**

|  |                              |                              |  |
|--|------------------------------|------------------------------|--|
| <input checked="" type="checkbox"/> Vernal Pool  | <input type="checkbox"/> Bog | <input type="checkbox"/> Fen | <input type="checkbox"/> Other (see below) |
| Comments: <i>Small, roughly 400 square feet; only fairy shrimp (moderate density); midges, aquatic worms; maximum water depth: 14"; average depth 11-12". 2-3" of organics over mineral soil bottom; moderate amount of LWD (Large woody debris)</i> |                              |                              |  |

<sup>1</sup> The wetland/watercourse unit could include more than one cover type. The dominant cover type is first.



**Mapped Soil Series/Units**

Wetland ID: WA/VP1

| Soil Series (Map Unit Symbol) | WET                                 | UP                                  | DRAINAGE CLASS | NRCS MAPPED                         | FIELD CONFIRMED                     |
|-------------------------------|-------------------------------------|-------------------------------------|----------------|-------------------------------------|-------------------------------------|
| <i>Fredon (14)</i>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | PD, SPD        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| <i>Groton (39)</i>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | ED             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
|                               | <input type="checkbox"/>            | <input type="checkbox"/>            |                | <input type="checkbox"/>            | <input type="checkbox"/>            |
|                               | <input type="checkbox"/>            | <input type="checkbox"/>            |                | <input type="checkbox"/>            | <input type="checkbox"/>            |
|                               | <input type="checkbox"/>            | <input type="checkbox"/>            |                | <input type="checkbox"/>            | <input type="checkbox"/>            |
|                               | <input type="checkbox"/>            | <input type="checkbox"/>            |                | <input type="checkbox"/>            | <input type="checkbox"/>            |

ED=excessively drained; SED=somewhat excessively drained; WD=well drained; MWD=moderately well drained;  
 SPD=somewhat poorly drained; PD=poorly drained; VPD=very poorly drained

**Observed Plants<sup>2,3</sup>** (within wetland/watercourse or along edge):

|                             |                      |                  |                          |
|-----------------------------|----------------------|------------------|--------------------------|
| <i>Green ash</i>            | <i>Sugar maple</i>   | <i>Red maple</i> | <i>Japanese barberry</i> |
| <u>Morrow's honeysuckle</u> | <i>Skunk cabbage</i> |                  |                          |
|                             |                      |                  |                          |
|                             |                      |                  |                          |
|                             |                      |                  |                          |
|                             |                      |                  |                          |
|                             |                      |                  |                          |
|                             |                      |                  |                          |

**Observed Wildlife/Finfish** (within wetland/watercourse or nearby):

|                             |                        |                  |                 |  |
|-----------------------------|------------------------|------------------|-----------------|--|
| <i>Red-bellied wdpcker.</i> | <i>Tufted titmouse</i> | <i>Chickadee</i> | <i>Blue jay</i> |  |
|                             |                        |                  |                 |  |
|                             |                        |                  |                 |  |

**Notes**

This is a small isolated wetland pocket, but within an overall wetland corridor stretching to the east. The seasonally flooded pool contains man-made debris such as tires. Water is stained with tannic acids.

Water Quality Sampling:

pH: 7.22; Conductivity: 39.8  $\mu$ S/cm; Temperature: 10.3 C; Dissolved oxygen: 2.10 mg/L;  
 Oxygen-Reduction Potential: +23 mV; Salinity: 0.0 ppt

<sup>2</sup> Dominant or abundant plant/wildlife species are underlined

<sup>3</sup> Invasive plants are double-underlined

# WETLAND/WATERCOURSE DELINEATION & CHARACTERIZATION FIELD FORM

|   |  |
|---|--|
| <b>Project:</b> +/- 5.317-acres, off of Railroad St., Salisbury, CT | <b>Wetland ID:</b> WB1 (VP#2)                    |
| Inspection Date: 4/19/14  | Wetland Flag Series: WL-4 to WL-13               |
| Inspector(s): G. Logan  | NWI Classification Codes: <sup>1</sup> PUB3/PFO1 |

|  |                        |
|--|------------------------|
| Weather/Field Conditions: Sunny, 50s   | Snow/Frost Depth: none |
| Soil Moisture: <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry                                |                        |
| Type of Wetland Delineation: <input checked="" type="checkbox"/> State <input type="checkbox"/> Federal <input type="checkbox"/> Other |                        |

## HGM Classification

|  |  |
|--|--|
| <input type="checkbox"/> Surface Water Slope | <input checked="" type="checkbox"/> Surface Water Depression |
| <input type="checkbox"/> Groundwater Slope   | <input checked="" type="checkbox"/> Groundwater Depression   |

## NWI Classification

### **System:**

|  |                                     |                                   |                                    |
|--|-------------------------------------|-----------------------------------|------------------------------------|
| <input checked="" type="checkbox"/> Palustrine | <input type="checkbox"/> Lacustrine | <input type="checkbox"/> Riverine | <input type="checkbox"/> Estuarine |
|--|-------------------------------------|-----------------------------------|------------------------------------|

### **Class:**

|  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> Forested | <input type="checkbox"/> Scrub Shrub                      | <input type="checkbox"/> Emergent             |
| <input type="checkbox"/> Aquatic Bed         | <input checked="" type="checkbox"/> Unconsolidated Bottom | <input type="checkbox"/> Unconsolidated Shore |

### **Subclass:**

|  |  |   |
|--|--|---|
| <input checked="" type="checkbox"/> Broad-leaved deciduous | <input type="checkbox"/> Needle-leaved evergreen | <input type="checkbox"/> Persistent     |
| <input type="checkbox"/> Non-persistent                    | <input type="checkbox"/> Sand                    | <input checked="" type="checkbox"/> Mud |
| <input type="checkbox"/> Other: _____                      |  |   |

## Wetland Hydrology

|  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> Seasonally Flooded | <input type="checkbox"/> Temporarily Flooded  | <input type="checkbox"/> Semi-permanently Flooded |
| <input type="checkbox"/> Seasonally Saturated          | <input checked="" type="checkbox"/> Saturated | <input type="checkbox"/> Permanently Flooded      |

## Watercourse Type

|                                       |                                    |                                |
|---------------------------------------|------------------------------------|--------------------------------|
| <input type="checkbox"/> Intermittent | <input type="checkbox"/> Perennial | <input type="checkbox"/> Tidal |
| Comments:                             |                                    |                                |

## Special Aquatic Habitat

|  |                              |                              |  |
|--|------------------------------|------------------------------|--|
| <input checked="" type="checkbox"/> Vernal Pool  | <input type="checkbox"/> Bog | <input type="checkbox"/> Fen | <input type="checkbox"/> Other (see below) |
| Comments: Moderate sized vernal pool habitat, roughly 5,000 square feet; many aquatic insects and invertebrates (e.g. mayflies, snails, worms, midges, water striders, mosquitoes, isopods, predaceous diving beetles, etc.); over 130 wood frog egg masses; 2-3" of leaf litter in 4-6" of water, over 2-3' of organics over a mineral soil bottom. |                              |                              |  |

<sup>1</sup> The wetland/watercourse unit could include more than one cover type. The dominant cover type is first.

**Mapped Soil Series/Units**

Wetland ID: WB1/VP2

| Soil Series (Map Unit Symbol)      | WET                                 | UP                                  | DRAINAGE CLASS | NRCS MAPPED                         | FIELD CONFIRMED                     |
|------------------------------------|-------------------------------------|-------------------------------------|----------------|-------------------------------------|-------------------------------------|
| <i>Fredon (14)</i>                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | PD, SPD        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| <i>Groton (39)</i>                 | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | ED             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <i>Timakwa &amp; Natchaug (17)</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | VPD            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
|                                    | <input type="checkbox"/>            | <input type="checkbox"/>            |                | <input type="checkbox"/>            | <input type="checkbox"/>            |
|                                    | <input type="checkbox"/>            | <input type="checkbox"/>            |                | <input type="checkbox"/>            | <input type="checkbox"/>            |
|                                    | <input type="checkbox"/>            | <input type="checkbox"/>            |                | <input type="checkbox"/>            | <input type="checkbox"/>            |

ED=excessively drained; SED=somewhat excessively drained; WD=well drained; MWD=moderately well drained;  
 SPD=somewhat poorly drained; PD=poorly drained; VPD=very poorly drained

**Observed Plants<sup>2,3</sup>** (within wetland/watercourse or along edge):

|                                    |                          |                  |                          |
|------------------------------------|--------------------------|------------------|--------------------------|
| <i>Green ash</i>                   | <i>Sugar maple</i>       | <i>Red maple</i> | <i>Japanese barberry</i> |
| <u><i>Morrow's honeysuckle</i></u> | <i>Skunk cabbage</i>     | <i>Ironwood</i>  | <i>Black cherry</i>      |
| <i>Arrowwood</i>                   | <i>Aquatic buttercup</i> | <i>Duckweed</i>  |                          |
|                                    |                          |                  |                          |
|                                    |                          |                  |                          |
|                                    |                          |                  |                          |
|                                    |                          |                  |                          |
|                                    |                          |                  |                          |
|                                    |                          |                  |                          |

**Observed Wildlife/Finfish** (within wetland/watercourse or nearby):

|                             |                        |                  |                 |                   |
|-----------------------------|------------------------|------------------|-----------------|-------------------|
| <i>Red-bellied wdpcker.</i> | <i>Tufted titmouse</i> | <i>Chickadee</i> | <i>Blue jay</i> | <i>Green frog</i> |
| <i>bluebird</i>             |                        |                  |                 |                   |
|                             |                        |                  |                 |                   |

**Notes**

*This is a wetland that is contiguous with Wetland B2 to the east. A large ponded area is a vernal pool habitat (see above). Due to season very little vegetation observed within the seasonally flooded to saturated areas. High primary productivity based on aquatic insects and invertebrates present.*

Water Quality Sampling:

*pH: 7.06; Conductivity: 340.3 mS/cm; Temperature: 15.6 C; Dissolved oxygen: 2.37 mg/L;  
 Oxygen-Reduction Potential: +55 mV; Salinity: 0.2 ppt*

<sup>2</sup> Dominant or abundant plant/wildlife species are underlined

<sup>3</sup> Invasive plants are double-underlined

# WETLAND/WATERCOURSE DELINEATION & CHARACTERIZATION FIELD FORM

|   |   |
|---|---|
| <b>Project:</b> +/- 5.317-acres, off of Railroad St., Salisbury, CT | <b>Wetland ID:</b> WB2 (VP#3)                     |
| Inspection Date: 4/19/14  | Wetland Flag Series: WL-1 to WL-4, WL-13 to WL-18 |
| Inspector(s): G. Logan  | NWI Classification Codes: <sup>1</sup> PFO1/PSS1  |

|  |                        |
|--|------------------------|
| Weather/Field Conditions: Sunny, 50s   | Snow/Frost Depth: none |
| Soil Moisture: <input type="checkbox"/> Wet <input type="checkbox"/> Moist <input type="checkbox"/> Dry                                |                        |
| Type of Wetland Delineation: <input checked="" type="checkbox"/> State <input type="checkbox"/> Federal <input type="checkbox"/> Other |                        |

## HGM Classification

|   |  |
|---|--|
| <input type="checkbox"/> Surface Water Slope          | <input checked="" type="checkbox"/> Surface Water Depression |
| <input checked="" type="checkbox"/> Groundwater Slope | <input checked="" type="checkbox"/> Groundwater Depression   |

## NWI Classification

### **System:**

|  |                                     |                                   |                                    |
|--|-------------------------------------|-----------------------------------|------------------------------------|
| <input checked="" type="checkbox"/> Palustrine | <input type="checkbox"/> Lacustrine | <input type="checkbox"/> Riverine | <input type="checkbox"/> Estuarine |
|--|-------------------------------------|-----------------------------------|------------------------------------|

### **Class:**

|  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> Forested | <input checked="" type="checkbox"/> Scrub Shrub | <input type="checkbox"/> Emergent             |
| <input type="checkbox"/> Aquatic Bed         | <input type="checkbox"/> Unconsolidated Bottom  | <input type="checkbox"/> Unconsolidated Shore |

### **Subclass:**

|  |  |                                     |
|--|--|-------------------------------------|
| <input checked="" type="checkbox"/> Broad-leaved deciduous | <input type="checkbox"/> Needle-leaved evergreen | <input type="checkbox"/> Persistent |
| <input type="checkbox"/> Non-persistent                    | <input type="checkbox"/> Sand                    | <input type="checkbox"/> Mud        |
| <input type="checkbox"/> Other: _____                      |  |                                     |

## Wetland Hydrology

|  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> Seasonally Flooded   | <input checked="" type="checkbox"/> Temporarily Flooded | <input type="checkbox"/> Semi-permanently Flooded |
| <input checked="" type="checkbox"/> Seasonally Saturated | <input checked="" type="checkbox"/> Saturated           | <input type="checkbox"/> Permanently Flooded      |

## Watercourse Type

|   |   |                                |
|---|---|--------------------------------|
| <input type="checkbox"/> Intermittent   | <input checked="" type="checkbox"/> Perennial | <input type="checkbox"/> Tidal |
| Comments: Although off-site, the wetland subunit discharges to Spruce Swamp Creek to the east; it is likely that this wetland sees occasional and temporary flooding at its far eastern extent from the adjacent watercourse. |   |                                |

## Special Aquatic Habitat

|  |                              |                              |  |
|--|------------------------------|------------------------------|--|
| <input checked="" type="checkbox"/> Vernal Pool  | <input type="checkbox"/> Bog | <input type="checkbox"/> Fen | <input type="checkbox"/> Other (see below) |
| Comments: Embedded vernal pool habitat within a larger wooded/scrub shrub swamp; overall potential vernal pool habitat is roughly 8,500 square feet (on-site and off-site); over 155 wood frog egg masses concentrated in three rafts; a cluster of 5 spotted salamander egg masses observed; an average of 4-6" of water, over 1-2' of organics over a mineral soil bottom. |                              |                              |  |

<sup>1</sup> The wetland/watercourse unit could include more than one cover type. The dominant cover type is first.

**Mapped Soil Series/Units**

Wetland ID: WB2/VP3

| Soil Series (Map Unit Symbol)      | WET                                 | UP                                  | DRAINAGE CLASS | NRCS MAPPED                         | FIELD CONFIRMED                     |
|------------------------------------|-------------------------------------|-------------------------------------|----------------|-------------------------------------|-------------------------------------|
| <i>Fredon (14)</i>                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | PD, SPD        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| <i>Groton (39)</i>                 | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | ED             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <i>Timakwa &amp; Natchaug (17)</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | VPD            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <i>Halsey (16)</i>                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | VPD            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
|                                    | <input type="checkbox"/>            | <input type="checkbox"/>            |                | <input type="checkbox"/>            | <input type="checkbox"/>            |
|                                    | <input type="checkbox"/>            | <input type="checkbox"/>            |                | <input type="checkbox"/>            | <input type="checkbox"/>            |

ED=excessively drained; SED=somewhat excessively drained; WD=well drained; MWD=moderately well drained;  
SPD=somewhat poorly drained; PD=poorly drained; VPD=very poorly drained

**Observed Plants<sup>2,3</sup>** (within wetland/watercourse or along edge):

|                                    |                          |                           |                           |
|------------------------------------|--------------------------|---------------------------|---------------------------|
| <i>Green ash</i>                   | <i>Sugar maple</i>       | <i>Red maple</i>          | <i>Japanese barberry</i>  |
| <u><i>Morrow's honeysuckle</i></u> | <i>Skunk cabbage</i>     | <i>Ironwood</i>           | <i>Black cherry</i>       |
| <i>Arrowwood</i>                   | <i>Red osier dogwood</i> | <i>Winterberry</i>        | <i>Highbush blueberry</i> |
| <i>Hellebore</i>                   | <i>Stout reedgrass</i>   | <i>Golden saxifrage</i>   | <i>Tussock sedge</i>      |
| <i>Sedges</i>                      | <i>Silky dogwood</i>     | <i>Evergreen woodfern</i> |                           |
|                                    |                          |                           |                           |
|                                    |                          |                           |                           |
|                                    |                          |                           |                           |
|                                    |                          |                           |                           |

**Observed Wildlife/Finfish** (within wetland/watercourse or nearby):

|                             |                        |                  |                 |             |
|-----------------------------|------------------------|------------------|-----------------|-------------|
| <i>Red-bellied wdpcker.</i> | <i>Tufted titmouse</i> | <i>Chickadee</i> | <i>Blue jay</i> | <i>Crow</i> |
| <i>bluebird</i>             | <i>Mourning dove</i>   | <i>Cardinal</i>  |                 |             |
|                             |                        |                  |                 |             |

**Notes**

This is a wetland that is contiguous with Wetland B1 to the west. A large seasonally flooded area is a vernal pool habitat (see above). Off-site the wetland is not flooded but mostly seasonally saturated. In the early growing season it overflows over mostly poorly drained soils to Spruce Swamp Creek to the east. The central portion the wetland subunit, which is seasonally flooded, is a scrub shrub swamp, while the perimeter and the eastern section, is classified as a wooded swamp. Due to season much of the emerging herbaceous vegetation could not be identified.

<sup>2</sup> Dominant or abundant plant/wildlife species are underlined

<sup>3</sup> Invasive plants are double-underlined

# WETLANDS: *The Physical Environment*

## WETLAND HYDROGEOMORPHIC CLASSIFICATION

**Surface-Water Depression Wetlands:** In these wetlands, precipitation and overland flow (surface runoff) collect in a depression where there is little or no groundwater discharge. Water leaves the wetland principally by evapotranspiration and infiltration (groundwater recharge). The wetland hydrologic system lies above the local or regional groundwater system and is isolated from it by an unsaturated zone; thus, it is said to be “perched.” In the glaciated Northeast, surface-water depression wetlands are most likely to form over bedrock or till deposits in topographically elevated areas of landscape; however, they may develop in lowland kettles or ice-block basins that formed in glaciolacustrine or fine-textured glaciofluvial deposits.

**Surface-Water Slope Wetlands:** These wetlands are located along the edge of stream or lake or on the sloping surface of a floodplain. They may occur on till or stratified drift but are commonly found on alluvium. While precipitation and overland flow also feed these wetlands, the principal source of water is the overflow of the adjacent water body. The sloping surface of the wetland permits water to drain readily back to the lake or river as its stage falls. As was the case with the previous class, the wetland surface usually lies well above the local water table, so groundwater discharge to the wetland is negligible or nonexistent. Groundwater recharge from the wetland is possible, depending on the permeability of underlying surficial deposits.

**Groundwater Depression Wetlands:** These wetlands occur where a basin intercepts the local groundwater table, so that groundwater discharge as well as precipitation and overland flow feed the wetland. Classic groundwater depression wetlands have no surface drainage leaving the site; however, occasional streamflow out may occur from basin overflow. Groundwater inflow may be continuous or seasonal, depending upon the depth of the basin and the degree of fluctuation of the local water table. During periods when the wetland water level is higher than the local groundwater table (e.g., after major precipitation events in dry season), groundwater recharge may occur. Groundwater may enter the wetland basin from all directions, or it may discharge in one area and recharge in another. In the glaciated Northeast, groundwater depression wetlands are most likely to occur in stratified drift, particularly in coarse-textured glaciofluvial deposits where relatively rapid movement between groundwater and surface water can occur.

**Groundwater Slope Wetlands:** These wetlands occur where groundwater discharges as springs or seeps at the land surface and drains away as streamflow. Most commonly, these wetlands occur on hillsides over till deposits or at the base of hills where stratified drift and till come into contact. Headwater wetlands are typically groundwater slope wetlands. The local water table slopes toward the wetland surface. Where groundwater flow is continuous, the soil remains saturated. At many sites, however, groundwater inputs cease during late summer or early fall as evapotranspiration depletes soil moisture in the root zone, in which case the soil is only seasonally saturated. Permanent ponding of water is prevented by the sloping land surface, but water may collect temporarily in isolated depressions. Precipitation and overland flow provide additional water to the wetland on an intermittent basis. Groundwater recharge may occur in the wetland after such events, but amounts are likely to be negligible, especially where wetland soils have formed over dense lodgment till deposits. Where such deposits are present, groundwater slope wetlands may be fed primarily by shallow groundwater systems perched above the regional system.

### Reference:

Golet, C.G., A.J.K. Calhoun, W.R. DeRagon, D.J. Lowry, and A.J. Gold. 1993. Ecology of Red Maple Swamps in the Glaciated Northeast: A Community Profile. USFWS. Biological Report No. 12



## WETLANDS: *The Physical Environment*

### **SOIL DRAINAGE CLASSES**

***Excessively drained:*** Brightly colored; usually coarse-textured; rapid permeability; very low water-holding capacity; subsoil free of mottles

***Somewhat excessively drained:*** Brightly colored; rather sandy; rapid permeability; low water-holding capacity; subsoil free of mottles

***Well drained:*** Color usually bright yellow, red, or brown; drain excess water readily, but contain sufficient fine material to provide adequate moisture for plant growth; subsoil is free of mottles to a depth of at least 36 inches.

***Moderately well drained:*** Generally any texture, but internal drainage is restricted to some degree; mottles common in the lower part of the subsoil, generally at a depth of 18 to 36 inches; may remain wet and cold later in spring; generally suited for agricultural use.

***Somewhat poorly drained:*** Remain wet for long periods of time due to slow removal of water; generally have a slowly permeable layer within the profile or a high water table; mottles common in the subsoil at a depth of 8 to 18 inches.

***Poorly drained:*** Dark, thick surface horizons commonly; gray colors usually dominate subsoil; water table at or near the surface during a considerable part of the year; mottles frequently found within 8 inches of the soil surface.

***Very poorly drained:*** Generally thick black surface horizons and gray subsoil; saturated by high water table most of the year; usually occur in level or depressed sites and are frequently ponded with water.

### **Reference:**

Wright, W. R., and E. H. Sautter. 1979. Soils of Rhode Island landscapes. R.I. Agric Exp. Station Bull. 429. 42 pp.

## WETLANDS: *The Plant Community*

### WETLAND CLASSES AND SUBCLASSES IN THE GLACIATED NORTHEAST

| WETLAND CLASS        | WETLAND SUBCLASS  |
|----------------------|---|
| <i>Open Water</i>    | (OW-1) Vegetated<br>(OW-2) Floating-leaved<br>(OW-3) Non-vegetated  |
| <i>Deep Marsh</i>    | (DM-1) Dead Woody<br>(DM-2) Shrub<br>(DM-3) Sub-shrub<br>(DM-4) Robust<br>(DM-5) Narrow-leaved<br>(DM-6) Broad-leaved |
| <i>Shallow Marsh</i> | (SM-1) Robust<br>(SM-2) Narrow-leaved<br>(SM-3) Broad-leaved  |
| <i>Meadow</i>        | (M-1) Ungrazed<br>(M-2) Grazed  |
| <i>Shrub Swamp</i>   | (SS-1) Sapling<br>(SS-2) Bushy<br>(SS-3) Compact<br>(SS-4) Aquatic  |
| <i>Wooded Swamp</i>  | (WS-1) Deciduous<br>(WS-2) Evergreen  |
| <i>Bog</i>           | (BG-1A) Compact Shrub<br>(BG-1B) Bushy Shrub<br>(BG-2) Wooded<br>(BG-3) Emergent                                      |

**Note:** Subclass (OW-2) has replaced (SM-4)  
Seasonally Flooded Class (SF-1 & SF-2) has been removed

#### Reference:

Golet, F.C., and J.S. Larson. 1974. Classification of freshwater wetlands in the glaciated Northeast. USFWS Resour. Publ. 116. 56 pp.

## WETLANDS: *The Physical Environment*

### COMMON WATER REGIMES OF NORTHEASTERN WETLANDS

**Seasonally flooded:** Surface water is present for extended periods, especially early in the growing season, but is absent by the end of the season in most years. When surface water is absent, the water table is often near the land surface.

**Temporarily flooded:** Surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the season.

**Seasonally saturated:** The soil is saturated to the surface, especially early in the growing season, but unsaturated conditions prevail by the end of the season in most years. Surface water is absent except for groundwater seepage and overland flow.

**Semi-permanently flooded:** Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.

**Permanently flooded:** Water covers the land surface throughout the year in all years. Vegetation is composed of obligate hydrophytes.

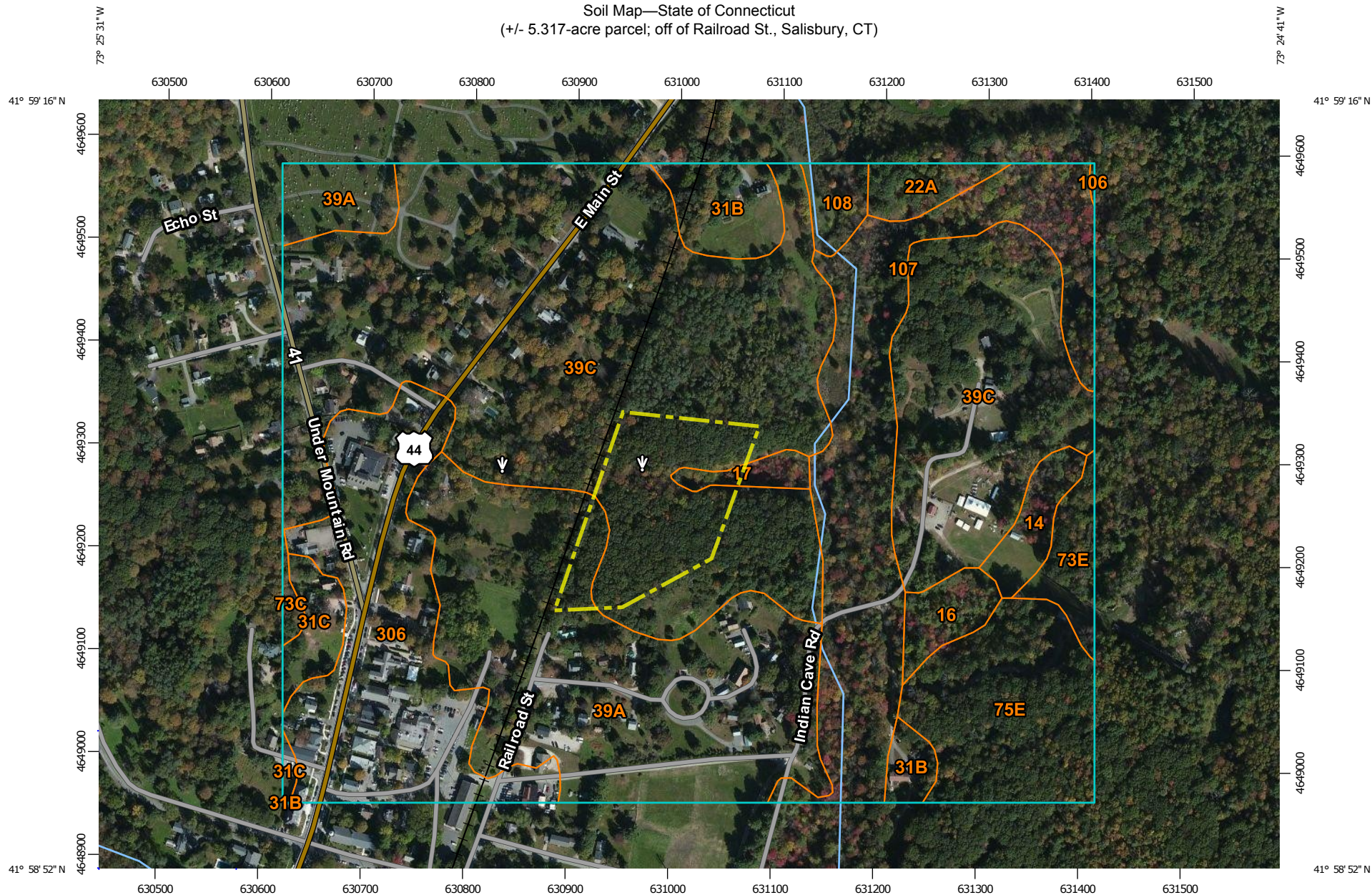
**Saturated:** The substratum is saturated to the surface for extended periods during the growing season, but surface water is seldom present. This water regime applies to permanently saturated, non-flooded wetlands such as bogs.

#### References:

- Golet, F. C., A. J. K. Calhoun, W. R. DeRagon, D. J. Lowry and A. J. Gold. 1993. Ecology of Red Maple Swamps in the Glaciated Northeast: A Community Profile. U. S. Dep. Int. Fish Wild. Serv. Biol. Rep. 12, 152 pp.
- Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U. S. Fish Wild. Serv. Biol. Serv. Program FWS-OBS 79/31. 103 pp.



Soil Map—State of Connecticut  
(+/- 5.317-acre parcel; off of Railroad St., Salisbury, CT)



Map Scale: 1:5,270 if printed on A landscape (11" x 8.5") sheet.

0 50 100 200 300 Meters

0 250 500 1000 1500 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84




Natural Resources  
Conservation Service

Web Soil Survey  
National Cooperative Soil Survey

6/25/2014  
Page 1 of 3

## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## 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: <http://websoilsurvey.nrcs.usda.gov>  
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 11, Nov 19, 2013

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

Date(s) aerial images were photographed: Jun 19, 2010—Oct 9, 2011

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


| State of Connecticut (CT600)       |   |              |                |
|------------------------------------|---|--------------|----------------|
| Map Unit Symbol                    | Map Unit Name   | Acres in AOI | Percent of AOI |
| 14                                 | Fredon silt loam  | 1.5          | 1.2%           |
| 16                                 | Halsey silt loam  | 1.4          | 1.2%           |
| 17                                 | Timakwa and Natchaug soils                                      | 0.8          | 0.6%           |
| 22A                                | Hero gravelly loam, 0 to 3 percent slopes                       | 1.3          | 1.0%           |
| 31B                                | Copake fine sandy loam, 3 to 8 percent slopes                   | 3.1          | 2.5%           |
| 31C                                | Copake gravelly loam, 8 to 15 percent slopes                    | 1.6          | 1.3%           |
| 39A                                | Groton gravelly sandy loam, 0 to 3 percent slopes               | 22.2         | 18.2%          |
| 39C                                | Groton gravelly sandy loam, 3 to 15 percent slopes              | 53.0         | 43.4%          |
| 73C                                | Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky  | 0.3          | 0.2%           |
| 73E                                | Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky | 1.7          | 1.4%           |
| 75E                                | Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes  | 7.4          | 6.0%           |
| 106                                | Winooski silt loam  | 0.0          | 0.0%           |
| 107                                | Limerick and Lim soils  | 13.8         | 11.3%          |
| 108                                | Saco silt loam  | 1.1          | 0.9%           |
| 306                                | Udorthents-Urban land complex                                   | 13.0         | 10.6%          |
| <b>Totals for Area of Interest</b> |   | <b>122.2</b> | <b>100.0%</b>  |

## **Attachment B**


---


Annotated Photos  
(1 to 19)

|   |   |   |                                |
|---|---|---|--------------------------------|
|     | <b>SITE/LOCATION:</b> Proposed Dresser Woods Affordable Residential Community<br>Railroad Street, Salisbury, CT | REMA<br>JOB NO.:<br>14-1729-SLS2  | <b>ANNOTATED<br/>PHOTO LOG</b> |
|   | <b>INVESTIGATOR(S):</b> G.Logan,MS,PWS,CSE;S.Gadwa,MS,PWS   |   |                                |
| <b>DATE:</b> May 13, 2022   | <b>FACING:</b> SOUTHERLY  | <b>PHOTO NO.:</b> 1   |                                |
|  |   | <b>Wetland WB1 (VP2).</b> Vernal pool with robust breeding by woodfrog. Tadpole density was high. Depth up to 2.5 feet. Immature hardwood forest with moderately well drained soils to the south. |                                |



|  |                          |   |  |
|--|--------------------------|---|--|
| <b>DATE:</b> May 13, 2022  | <b>FACING:</b> NORTHERLY | <b>PHOTO NO.:</b> 2   |  |
|  |                          | Hardwood forest near rail trail to the south of the wetland corridor. Forest is dominated by sugar maple, with some tulip tree and Athyrium ferns in the foreground. Penn sedge patch is at upper left. Note occasional Japanese barberry, which will spread if not controlled. |  |




|   |   |  |                                |
|---|---|--|--------------------------------|
|     | <b>SITE/LOCATION:</b> Proposed Dresser Woods Affordable Residential Community<br>Railroad Street, Salisbury, CT | REMA<br>JOB NO.:<br>14-1729-SLS2   | <b>ANNOTATED<br/>PHOTO LOG</b> |
|   | <b>INVESTIGATOR(S):</b> G.Logan,MS,PWS,CSE;S.Gadwa,MS,PWS   |  |                                |
| <b>DATE:</b> September 28, 2022   | <b>FACING:</b> n/a  | <b>PHOTO NO.:</b> 3  |                                |
|  |   | Wood frog, well-camouflaged in the leaf litter. Over a dozen small, recently metamorphosed wood frogs were observed in hardwood forest to the south of Vernal Pool 2, within about 100 feet, testimony to successful breeding. |                                |



|  |                    |   |  |
|--|--------------------|---|--|
| <b>DATE:</b> May 13, 2022  | <b>FACING:</b> n/a | <b>PHOTO NO.:</b> 4   |  |
|  |                    | <i>Wetland A. Garter snake was feeding on fairy shrimp, concentrated by the drawdown in Vernal Pool 1 . On May 13, only two to three inches of water remained in this small pool, fed by surface water.</i> |  |



|   |   |  |                            |
|---|---|--|----------------------------|
|     | <b>SITE/LOCATION:</b> Proposed Dresser Woods Affordable Residential Community<br>Railroad Street, Salisbury, CT | <b>REMA JOB NO.:</b><br>14-1729-SLS2   | <b>ANNOTATED PHOTO LOG</b> |
|   | <b>INVESTIGATOR(S):</b> G.Logan,MS,PWS,CSE;S.Gadwa,MS,PWS   |  |                            |
| <b>DATE:</b> May 13, 2022   | <b>FACING:</b> NORTHERLY  | <b>PHOTO NO.:</b> 5  |                            |
|  |   | <i>Moist forest just to the southwest of Vernal Pool 1 (WA), with low density skunk cabbage and woody debris. This area will be preserved.</i> |                            |



|  |                         |   |  |
|--|-------------------------|---|--|
| <b>DATE:</b> May 13, 2022  | <b>FACING:</b> CLOSE-UP | <b>PHOTO NO.:</b> 6   |  |
|  |                         | <i>Thalictrum thalictoides, was one of several ephemeral spring wildflowers observed in moderately well-drained soil west of Vernal Pool 1.</i> |  |



|   |   |  |                            |
|---|---|--|----------------------------|
|     | <b>SITE/LOCATION:</b> Proposed Dresser Woods Affordable Residential Community<br>Railroad Street, Salisbury, CT | <b>REMA JOB NO.:</b><br>14-1729-SLS2   | <b>ANNOTATED PHOTO LOG</b> |
|   | <b>INVESTIGATOR(S):</b> G.Logan,MS,PWS,CSE;S.Gadwa,MS,PWS   |  |                            |
| <b>DATE:</b> September 28, 2023   | <b>FACING:</b> SOUTHWESTERLY  | <b>PHOTO NO.:</b> 7  |                            |
|  |   | <p>View towards rail trail embankment. This forest is in the northern portion of the development, to the south of Vernal Pool 1 (WA). Note the undulating topography and the Penn sedge lawn in foreground and at left. Penn sedge can be left in place at the perimeter of the development, or transplanted, using a technique similar to sod installation.</p> |                            |



|  |                              |  |  |
|--|------------------------------|--|--|
| <b>DATE:</b> September 28, 2023  | <b>FACING:</b> SOUTHWESTERLY | <b>PHOTO NO.:</b> 8  |  |
|  |                              | <p>View from south end of site, at western edge of proposed development footprint towards existing residential development. Note white wood aster on embankment of the rail trail. towards rail trail embankment. Oak tree and embankment will remain undisturbed.</p> |  |



|   |   |   |                            |
|---|---|---|----------------------------|
|     | <b>SITE/LOCATION:</b> Proposed Dresser Woods Affordable Residential Community<br>Railroad Street, Salisbury, CT | <b>REMA JOB NO.:</b><br>14-1729-SLS2  | <b>ANNOTATED PHOTO LOG</b> |
|   | <b>INVESTIGATOR(S):</b> G.Logan,MS,PWS,CSE;S.Gadwa,MS,PWS   |   |                            |
| <b>DATE:</b> September 28, 2023   | <b>FACING:</b> SOUTHERLY  | <b>PHOTO NO.:</b> 9   |                            |
|  |   | <i>View of middle of proposed development footprint. Scarlet oaks are dominant, and downy shadbush is common. Both do well in a residential setting. Note patch of lowbush blueberry in lower right corner. Blueberry "sod" can also be transplanted, provided suitable soil is also moved.</i> |                            |



|  |                         |   |  |
|--|-------------------------|---|--|
| <b>DATE:</b> October 13, 2022  | <b>FACING:</b> CLOSE-UP | <b>PHOTO NO.:</b> 10  |  |
|  |                         | <i>Groundcover in the hardwood forest in the development footprint. Low evergreen groundcover is partridgeberry and a blue-green Carex sedge. Fine-bladed, prostrate, dormant evergreen Penn sedge, Carex pennsylvanica, is the matrix.</i> |  |



|   |   |  |                            |
|---|---|--|----------------------------|
|     | <b>SITE/LOCATION:</b> Proposed Dresser Woods Affordable Residential Community<br>Railroad Street, Salisbury, CT | <b>REMA JOB NO.:</b><br>14-1729-SLS2   | <b>ANNOTATED PHOTO LOG</b> |
|   | <b>INVESTIGATOR(S):</b> G.Logan,MS,PWS,CSE;S.Gadwa,MS,PWS   |  |                            |
| <b>DATE:</b> September 28, 2023   | <b>FACING:</b> NORTHERLY  | <b>PHOTO NO.:</b> 11   |                            |
|  |   | Vernal Pool 3 (Wetland B2), embedded in an ironwood and alder stand, is still held water in late September. Five spotted salamder egg masses were found here in 2014. Larval mayflies and fingernail clams were netted here in 2023. |                            |



|  |                    |  |  |
|--|--------------------|--|--|
| <b>DATE:</b> May 13, 2022  | <b>FACING:</b> n/a | <b>PHOTO NO.:</b> 12   |  |
|  |                    | Vegetation in saturated soil in WB2 between VP2 and VP3 includes skunk cabbage, swamp buttercup, and Pennsylvania cress. |  |




|   |   |  |                            |
|---|---|--|----------------------------|
|     | <b>SITE/LOCATION:</b> Proposed Dresser Woods Affordable Residential Community<br>Railroad Street, Salisbury, CT | <b>REMA JOB NO.:</b><br>14-1729-SLS2   | <b>ANNOTATED PHOTO LOG</b> |
|   | <b>INVESTIGATOR(S):</b> G.Logan,MS,PWS,CSE;S.Gadwa,MS,PWS   |  |                            |
| <b>DATE:</b> May 13, 2022   | <b>FACING:</b> NORTHEASTERLY  | <b>PHOTO NO.:</b> 13   |                            |
|  |   | <i>On-site portion of Wetland B2, with Vernal Pool 3, viewed from adjacent moderated well-drained forest at the edge of the project. Note the leaning ironwoods.</i> |                            |



|  |                              |  |  |
|--|------------------------------|--|--|
| <b>DATE:</b> September 28, 2022  | <b>FACING:</b> SOUTHEASTERLY | <b>PHOTO NO.:</b> 14   |  |
|  |                              | <i>Emergent vegetation in the shallow flooded portion of WB2: rhizomatous, vegetative sedge, Carex utriculata. Black ash is in the distance. Shrub swamp cover type is codominant.</i> |  |




|   |   |   |                            |
|---|---|---|----------------------------|
|     | <b>SITE/LOCATION:</b> Proposed Dresser Woods Affordable Residential Community<br>Railroad Street, Salisbury, CT | <b>REMA JOB NO.:</b><br>14-1729-SLS2  | <b>ANNOTATED PHOTO LOG</b> |
|   | <b>INVESTIGATOR(S):</b> G.Logan,MS,PWS,CSE;S.Gadwa,MS,PWS   |   |                            |
| <b>DATE:</b> September 28, 2023   | <b>FACING:</b> EASTERLY   | <b>PHOTO NO.:</b> 15  |                            |
|  |   | <i>Living black ash cluster at edge of shrub swamp cover type in WB2, just offsite to the east. Sensitive fern is dominant in foreground.</i> |                            |



|  |                         |  |  |
|--|-------------------------|--|--|
| <b>DATE:</b> September 28, 2023  | <b>FACING:</b> EASTERLY | <b>PHOTO NO.:</b> 16   |  |
|  |                         | Offsite, eastern portion of Wetland B2, closest to Spruce Swamp Creek. Vegetation on this seepage slope is dense and diverse, dominated by forbs and shrubs. |  |



|   |   |  |                            |
|---|---|--|----------------------------|
|     | <b>SITE/LOCATION:</b> Proposed Dresser Woods Affordable Residential Community<br>Railroad Street, Salisbury, CT | <b>REMA JOB NO.:</b><br>23-1729-SLS2   | <b>ANNOTATED PHOTO LOG</b> |
|   | <b>INVESTIGATOR(S):</b> G.Logan,MS,PWS,CSE;S.Gadwa,MS,PWS   |  |                            |
| <b>DATE:</b> September 28, 2023   | <b>FACING:</b> SOUTHERLY  | <b>PHOTO NO.:</b> 17   |                            |
|  |   | <i>Riparian corridor along Spruce Swamp Creek, facing downstream. Note dense Japanese barberry on bank-top, stable, vegetated banks, somewhat turbid water, and lack of riffles.</i> |                            |

|  |                              |  |  |
|--|------------------------------|--|--|
| <b>DATE:</b> September 28, 2023  | <b>FACING:</b> NORTHEASTERLY | <b>PHOTO NO.:</b> 18   |  |
|  |                              | <i>View accross Spruce Swamp Creek, adjacent to the hillside wetland (WB2). Note the exposed gravel bar within the channel. The substrate is largely sand with gravel. Habitat is not productive. Exploratory netting yielded few aquaitic insects, but they did include several pollution intolerant taxa, consistent with the creek's largely undeveloped watershed.</i> |  |



|   |   |   |                            |
|---|---|---|----------------------------|
|     | <b>SITE/LOCATION:</b> Proposed Dresser Woods Affordable Residential Community<br>Railroad Street, Salisbury, CT | <b>REMA JOB NO.:</b><br>14-1729-SLS2  | <b>ANNOTATED PHOTO LOG</b> |
|   | <b>INVESTIGATOR(S):</b> G.Logan,MS,PWS,CSE;S.Gadwa,MS,PWS   |   |                            |
| <b>DATE:</b> September 28, 2023   | <b>FACING:</b> SOUTHERLY  | <b>PHOTO NO.:</b> 19  |                            |
|  |   | <i>Protected riparian corridor along Spruce Swamp Creek, offsite, east of the proposed project. This is highly suitable terrestrial habitat for vernal pool amphibians.</i> |                            |



## **Attachment C**

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### **USGS Stream States** *(Cedar Swamp Creek)*

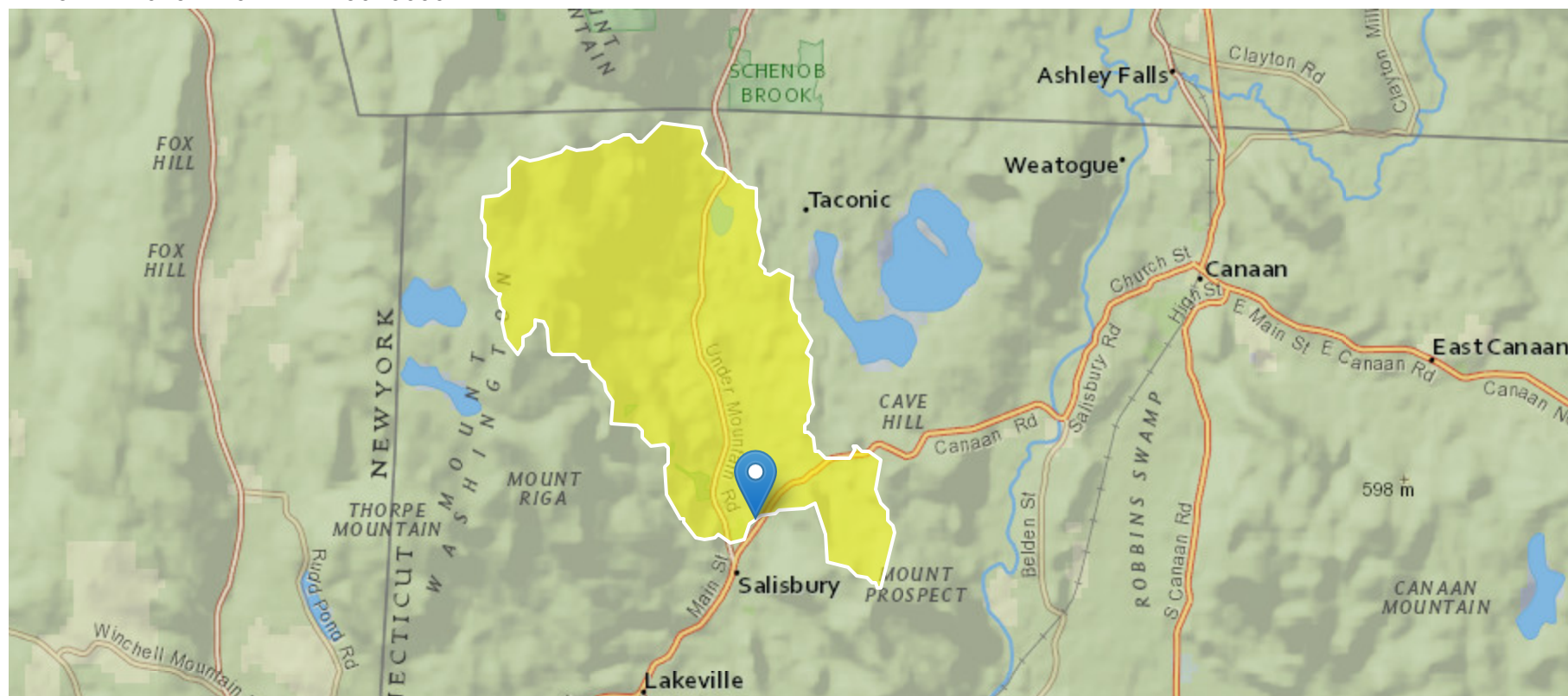
## StreamStats Report for Spruce Swamp Creek watershed, upgradient of Route 44 Crossing, in NW Salisbury, CT

**Region ID:** CT

**Workspace ID:** CT20231204221408186000

**Clicked Point (Latitude, Longitude):** 41.99002, -73.41811

**Time:** 2023-12-04 17:14:30 -0500



The upper watershed of Spruce Creek Brook includes the eastern, southern, and southwestern slopes of Bear Mountain and the north side of Lion's Head. Headwaters brooks include Moore Brook, Ball Brook, and Brassie Brook. Farmland is

an important land use in the lower part of the basin, a potential pollutant source. Another stretch with potential for pollution is a 600-foot stretch, where the creek flows along the west side of Undermountain Road, which is fairly busy. Just downstream of the analysis point, Spruce Creek Brook enters the developed center of Salisbury, passing just east of a large apartment complex.

[+ Collapse All](#)

## ➤ Basin Characteristics

| Parameter Code | Parameter Description  | Value | Unit         |
|----------------|--|-------|--------------|
| CAT1ROADS      | Length of interstates lmt'd access highways and ramps for lmt'd access highways, includes cloverleaf interchanges (USGS Ntl Transp Dataset)            | 0     | miles        |
| CAT2ROADS      | Length of sec hwy or maj connecting roads; main arteries & hwys not lmt'd access, usually in the US Hwy or State Hwy systems (USGS Ntl Transp Dataset) | 1.12  | miles        |
| CAT3ROADS      | Length of local connecting roads; roads that collect traffic from local roads & connect towns, subdivisions & neighborhoods (USGS Nat Transp Dataset)  | 3.95  | miles        |
| CAT4ROADS      | Length of local roads; generally paved street, road, or byway that usually have single lane of traffic in each direction (USGS Ntnl Transp Dataset)    | 16.4  | miles        |
| DRNAREA        | Area that drains to a point on a stream  | 9.74  | square miles |
| LC11DEV        | Percentage of developed (urban) land from NLCD 2011 classes 21-24  | 4.24  | percent      |
| LC11IMP        | Average percentage of impervious area determined from NLCD 2011 impervious dataset   | 0.4   | percent      |
| STRMTOT        | total length of all mapped streams (1:24,000-scale) in the basin   | 20.1  | miles        |
| WETLAND        | Percentage of Wetlands   | 1.58  | percent      |



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Application Version: 4.19.1

StreamStats Services Version: 1.2.22

NSS Services Version: 2.3.2