



EX#7

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Land Use Department

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March 12, 2026

Town of Ledyard
Inland Wetland and Watercourse Commission
Ms. Elizabeth Burdick, Director of Planning
741 Colonel Ledyard Highway
Ledyard, CT 06339

**RE: WETLAND IMPACT EVALUATION
PREPARED FOR MR. STEVEN RICE
PROPOSED OPEN SPACE SUBDIVISION
84 SILAS DEANE ROAD
59 SEABURY AVENUE
LEDYARD, CONNECTICUT**

Dear Ms. Burdick, Chairman, DeBrodts and Commission Members:

INTRODUCTION

On behalf of the Applicant, Mr. Steven Rice, I have completed a wetland delineation and evaluation of the jurisdictional freshwater inland wetlands and watercourses at the above referenced Project Site. This evaluation was completed to provide a basis for determining the potential impacts associated with the proposed open space residential subdivision of these parcels. Details of the proposed development are presented in the Project Site Plans and the wetland application.

This evaluation identifies the site's natural resources, assesses the potential for adverse impacts to regulated resources and offers some practical recommendations that would further promote environmental protection. Field surveys were conducted on the site in the summer of 2024. The 2026 work builds upon biological and wetland surveys conducted on the site. GIS software (ArcMap v10.0) was used to review open source GIS data layers in order to catalog abiotic resources and understand the significance of the study area in relation to the entire watershed.

and sugar maple, American beech, black cherry, black and white birch, aspen and tulip trees. Overall, where the forest community is dominated by large old growth trees the understory consists of a light shrub stratum of witch hazel, low-bush blueberry, green briar, and muscle wood (Photo 7). The forest floor ground cover includes species such as Christmas fern, service berry, Canadian mayflower intermingled with beds of hay-scented fern, and marginal wood fern. (Photo 8) Along the transitional forest ecotones that abut neighboring developments and the roadside is a cohort of smaller younger trees from past clearings, and the successional upland forest community has a heavier influence of birch, maple and tulip and a thicker undergrowth of Japanese barberry, an echo-signature of those past land disturbances.

The site is not located in aquifer protection zone. Lastly, the site is not located in a Connecticut Department of Energy and Environmental Protection (CTDEEP) designated Natural Diversity Data Base (NDDB) polygon per the CTDEEP 2026 NDDB mapper.

WETLAND DELINEATION

The wetland delineation was completed in accordance with the standards of the Natural Resources Conservation Services (NRCS) National Cooperative Soil Survey and the definitions of inland wetlands and watercourses as found in the Connecticut General Statutes, Chapter 440, Sections 22a-36 through 22a-45 as amended. Wetlands, as defined by the Statute, are those soil types designated as poorly drained, very poorly drained, floodplain or alluvial in accordance with the NRCS National Cooperative Soil Survey. Such areas may also include disturbed areas that have been filled, graded, or excavated and which possess an aquic (saturated) soil moisture regime.

Watercourses means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs, and all other bodies of water, natural or artificial, vernal, or intermittent, public, or private, which are contained within, flow through or border upon the Town of Ledyard or any portion thereof not regulated pursuant to sections 22a-28 through 22a-35, inclusive, of the Connecticut General Statutes. Intermittent watercourses are defined as having a permanent channel and bank and the occurrence of two or more of the following characteristics: (a) evidence of scour or deposits of recent alluvium or detritus, (b) the presence of standing or flowing water for duration longer than a particular storm incident, and (c) the presence of hydrophytic vegetation.

The wetland delineation was completed in June and July of 2024. Four wetland areas were identified on the Project Site.

WETLAND AND WATERCOURSE DESCRIPTIONS

The United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) Mapper shows the onsite wetlands as part of palustrine and riverine wetland group that classifies the forested wetland areas as a PFO1F, designating the jurisdictional feature as a forested wetland that is semi-permanently flooded, and notes the intermittent watercourse that flows to Silas Dean Road as R4SABC. Additionally the man-made pond is noted as PUBHh which denotes a fresh water unconsolidated bottom (mud, organics and silts) that was excavated (i.e. man-made). Generally, the wetland boundaries

The above is not an exhaustive list, but a sample of commonly encountered vegetation that characterizes the on-site wetland community. Representative photos of the site are attached below.

SOIL TYPES

The soils identified on the site are a refinement of the Natural Resources Conservation Service (NRCS) Websoil survey. The on-site soils originated from dense glacial till parent material. The development area and western half of the property is relatively level in comparison to the eastern side of the site that is steeply sloping and has exposed bedrock that defines landscape. The site has varying slopes ranging from <1% to >35% and elevations ranging generally from 370 at the terminus of Seabury Avenue down to 180 at Shewville Road on the eastern limits of the site.

Wetland Soils

The wetlands soils are classified as (3) Ridgebury, Leicester, and Whitman fine sandy loams. The poorly drained soils along the wetland boundary belong to the Ridgebury and Leicester soil series. Ridgebury and Leicester soils are found within drainageways and depressions on glacial till landscapes. Ridgebury and Leicester soils have a seasonal high-water table at a depth of about 6 inches. Very poorly drained Whitman soils are found in the lowest lying areas within the interior of the wetlands where the water table is at the surface thought most of the growing season.

A typical soil profile along the wetland boundary consists of approximately 2'-0" of intermediately decomposed organic material (Oi), followed by 0'-6" of a thick dark topsoil horizon (A), underlain by 6-18" of a wet weakly developed grayish subsoil horizon (Bg) with common redoximorphic features (Common medium distinct strong brown mottles, masses) ranging from fine sandy loam to very fine sandy loam. This subsoil is underlain by a saturated sandy loam to fine sandy loam gray substratum (2Cg).

Upland Soils

The bulk of the uplands are mapped and classified as well-drained Canton and Charlton fine sandy loams in a north to south orientation. Shallow depth to ledge may be encountered along topographic ridgelines. In the center of the proposed development is a notable polygon of Sutton, extremely stony fine sandy loams. Sutton soils are typically associated with a perched high seasonal watertable due to an underlying dense till layer.

Surficial Geology

Surficial geology refers to the distribution of surficial (unconsolidated) materials that lie between the land surface (below the pedogenic soil) and the bedrock surface. Surficial material in Connecticut ranges from a few feet to several hundred feet in thickness. These earth materials significantly affect anthropogenic land uses. Most of the unconsolidated materials are deposits of continental glaciers that covered all of New England at least twice during the Pleistocene ice age.

However, Wetland #4 at the base of the hill along Shewville Road is an isolated seasonally to semi-permanently flooded wetland pocket that potentially could host vernal pool habitat for species such as wood frogs or yellow spotted salamanders. Because this wetland area will not be impacted by being far removed from the zone of influence of the project (over 550-feet away) and coupled with the fact the feature and the surrounding forest will be preserved in the open space area this wetland was never formally surveyed for vernal pool activity but is presumed as a vernal pool based on its physical characteristics and commonality to other nearby pools in Ledyard and on the neighboring Mashantucket reservation why are confirmed to host obligate vernal pool species.

WETLAND FUNCTIONS AND VALUES

A wetland functional assessment was completed to assist in identifying impacts to the wetlands and the functions and services they provide. An evaluation of the wetlands functions and values was completed using the United States Army Corps of Engineers (USACE) Highway Methodology Workbook for Wetland Functions and Values: A Descriptive Approach, October 1993” (“Highway Methodology”) and best professional judgement. This wetland methodology describes the wetland functions and values holistically for the project area.

The USACE Highway Methodology evaluates 13 functions and values assigned to wetlands which include:

1. Groundwater recharge/discharge (GWR/D)
2. Flood flow alteration (FFA)
3. Fish and shellfish habitat (F&SH)
4. Sediment/toxicant/pathogen retention (S&TR)
5. Nutrient removal/retention/transformation (NR&T)
6. Production export (PE)
7. Sediment/shoreline stabilization (S&S)
8. Wildlife habitat (WLH)
9. Recreation (REC)
10. Education/scientific value (ED/S)
11. Uniqueness/heritage (U/H)
12. Visual quality/aesthetics (VO/A)
13. Threatened or endangered species habitat (T&E)

The functions and values of the wetland system is summarized in Table 1. The *Highway Methodology* recognizes 13 separate wetland functions and values. The degree to which a wetland provides each of these functions is determined by one or more of the following factors: landscape position, substrate, hydrology, vegetation, history of disturbance, and size. Each wetland may provide one or more of the listed functions at significant levels. The determining factors that affect the level of function provided by a wetland can often

Wetland Functions and Values	Groundwater Recharge/Discharge	Sediment/Shoreline Stabilization	Floodflow Alteration	Fish & Shellfish Habitat	Sediment/Toxicant/Pathogen Retention	Nutrient Removal/Attenuation	Production Export	Wildlife Habitat	Recreation	Educational/Scientific Value	Uniqueness/Heritage	Visual Quality/Aesthetics	Listed Species Habitat
WETLAND #1	P	S	P	P	S	S	S	P	S	S	S	S	U
WETLAND #2	P	U	U	U	S	S	S	S	U	U	U	U	U
WETLAND #3	P	U	U	U	S	S	S	S	U	U	U	S	U
WETLAND #4	P	U	S	U	S	S	U	S	U	S	U	S	S
Suitability P = principal function S = secondary function U = function unlikely to be provided at a significant level N/A = not applicable or unknown													

Table:1 Wetland Functions and Values

Groundwater recharge and discharge are a primary function of the wetland systems. All the wetlands show evidence of variable water levels, and while recharge / discharge of groundwater is a principle function, it is not anticipated that the proposed development will impact the groundwater levels.

Moreover, wetland system #1 near the development was identified to have the additional following principle functions:

1. Flood-flow alteration: the wetland is able to detain locally appreciable quantities of water during storm and flooding events.
2. Fish habitat, there are known fish presence in the pond.
3. Wildlife Habitat: Wetland dependent species such as Fish and waterfowl use of the wetlands and Pond.

The proposed activities will not negatively or adversely impact the functionality of the onsite wetland(s) as described above. These listed functions can be maintained and promoted by maintaining overall on-site drainage patterns, demonstrating a compliant septic system, maintaining erosion and sedimentation controls through construction,

Sediment Control. Silt fencing, anti-tracking pads and other E&S measures are proposed to control sediment from construction activities.

The risk for potential adverse impacts from erosion and sedimentation is considered low to moderate because 1.) A detailed erosion and sediment control plan has been prepared, 2) the site's in-situ undisturbed soils are for the most part low to moderately erosive. 3) the site is vegetated, and topography is easily managed, and 4) there is no need for large scale tree removal, only sites under active construction will be cleared to keep the building area envelope to a manageable size. Therefore, it is my professional opinion that with coordination and watchful monitoring and maintenance of erosion and sediment controls until construction is completed and restoration activities have stabilized the ground conditions there will be no anticipated adverse impacts to the regulated resources resulting from sedimentation discharging from the development of the parcel as proposed.

VEGETATION REMOVAL AND HABITAT LOSS

Habitat loss associated with land clearing is a consequence of land development which has the potential of impacting wetlands and watercourses. Clustering the development in one area greatly reduces the fragmentation of the overall 49.8 acre property. As such the project reduces a significant landscape conversion. The proposed development will keep clearing limits to a minimum by clearing what is physically needed for facilitating the construction site improvements, dwellings and associated appurtenances. The conversion of the vegetation cover within the development envelope will not change or diminish the ecological integrity of the open space uplands and/or the wetland communities. The site clearing planned on the western side of the Project site and grading activities will not de-water nor flood the nearby wetlands or alter surface water drainage patterns in a significant manner that exacerbates erosion or causes downstream issues.

The project will result in the conversion of roughly 15 acres of forest to single-family residential suburban neighborhood. Provided in the following sections are the implications of that habitat conversion on the species confirmed present or those that could potentially occur on the site based on the presence of suitable habitat.

clustering the development in an open space concept allows the Project to permanently preserve 31.83 acres of contiguous forest that abuts three road frontages. The open space will also encompass and includes all four wetland resources areas identified on the property.

IMPACTS TO HYDROLOGY

In Connecticut, the design and implementation of stormwater management measures are guided by the Connecticut Department of Energy and Environmental Protection (CT DEEP) Stormwater Quality Manual (2024), developed pursuant to Phase II of the federal Clean Water Act (CWA). The Manual provides a framework of BMPs demonstrated through research and field performance data to effectively reduce pollutant loads and mitigate hydrologic alteration associated with land development. While these guidelines do not replace the engineering judgment or site-specific design developed by a licensed

The wooded swamp provides favorable conditions for denitrification and nutrient attenuation. The forested buffer between the proposed development and subject wetland ranges from 40 to 100 feet in width. Within this buffer, groundwater flows are diffuse and slow-moving through saturated soils, creating extended residence times that enhance biogeochemical processing. The high organic matter content, combined with root uptake by trees and shrubs, facilitates removal of nitrogen and phosphorus from shallow groundwater. Where preserved, deep-rooted perennial forbs along the swales will further contribute to nutrient uptake. Based on field observations and GIS-based watershed analysis it is unlikely water quality and aquatic habitat will be negatively or adversely affected by the proposed residential development and associated septic systems.

The engineered subsurface sewage disposal system requires health department approval. Human health water quality criteria are based on the toxicity of a contaminant and the amount of the contaminant consumed through ingestion of water and fish regardless of the type of water. Therefore, both the EPA and State chemical-specific human health criteria are directly applicable to wetlands. Consequently, demonstrating the project meets health department criteria implies the activity will not adversely affect the wetland resources.

RECOMMENDATIONS

1. Where activities are within 50 feet of a regulated wetland provide a double row of silt fencing and/or erosion & sediment control measures, particularly between the limits of disturbances and the man-made pond (WELAND #1) centrally located on the site.
2. Prior to the start of construction the wetland boundary should be re-flagged with new hi-visibility flagging so the line is readily identifiable to civil contractors completing site work.

SUMMARY

The project has been designed so that there will be no direct impacts on wetlands and watercourses. Furthermore, it is my professional opinion that the project will not have negative secondary or indirect impacts to wetlands or watercourses. Strict adherence to the detailed erosion and sediment control plan and stormwater pollution prevention plan will minimize any impacts to water quality during construction.

The project will result in some loss of native upland forest habitat, as clearing and grading of approximately 15 total acres of the site will be required, resulting in the conversion of mixed hardwood forest habitat to residential single family subdivision neighborhood. Biological surveys did not reveal the presence of any State of Connecticut or Federally listed species. The impacts to habitat and wildlife are expected to be less significant when compared to impacts associated with a traditional residential development which would fragment the parcel and result in a larger disruption to the ecosystem. The proposed project will result in a concentration of activity and will preserve a large contiguous block of forest as undisturbed natural open space.



PHOTO 1: WETLAND #1 – MAN-MADE POND IN CENTER OF SITE



PHOTO 2: DISCHARGE FROM WETLAND #1 WHICH FORMS THE “HANGING” WATERCOURSE THAT INFILTRATES BACK INTO THE SANDY UPLAND SOIL ROUGHLY 150’ DOWN HILL OF THE POND’S OVERFLOW OUTLET.



PHOTO 5: HEADWALL AT SILAS DEANE ROAD THAT INTERCEPTS FLOWS FROM WETLAND #3 AND CARRIES THE STREAM CHANNEL UNDER SILAS DEANE ROAD.



PHOTO 6: WETLAND #4 – ISOLATED WETLAND POCKET NEXT TO 837 SHEVILLE ROAD

If you have any questions or comments, please do not hesitate to contact me at itcole@gmail.com or (860) 514-5642.

Sincerely,



Ian T. Cole
Professional Registered Soil Scientist
Professional Wetland Scientist #2006

ATTACHMENTS

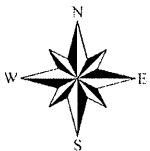
SITE PHOTOS

GIS MAP(S)

USFWS NWI

NRCS SOIL MAP

CTDEEP NDDDB PRELIM SITE ASSESSMENT



Ledyard, CT

1 inch = 354 Feet

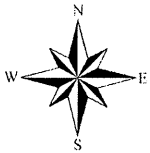


www.cai-tech.com

March 7, 2026



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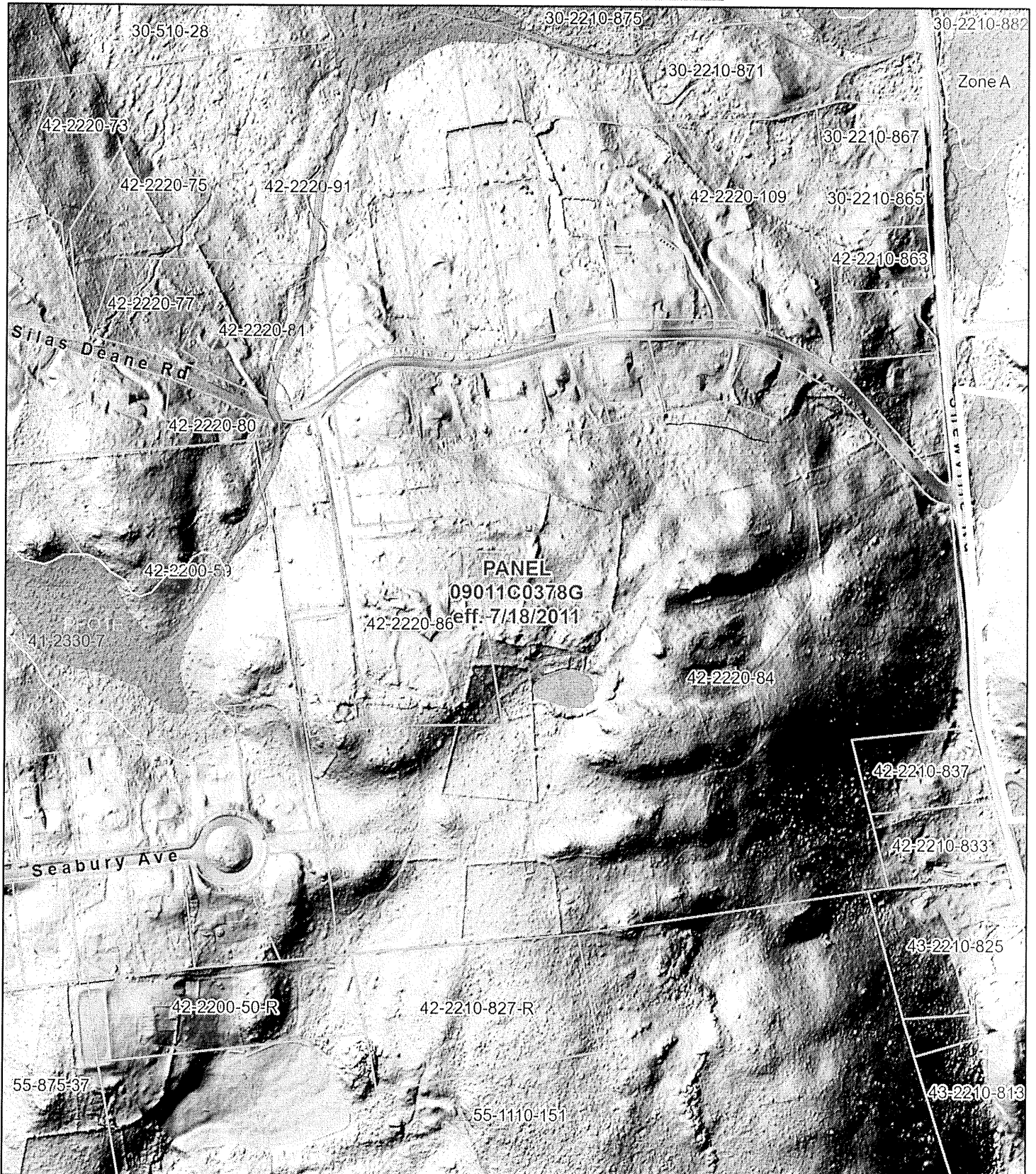
Ledyard, CT

1 inch = 355 Feet



www.cai-tech.com

March 7, 2026



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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

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

Spoil Area

Spoil Area

Stony Spot

Stony Spot

Very Stony Spot

Very Stony Spot

Wet Spot

Wet Spot

Other

Other

Special Line Features

Special Line Features

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut, Eastern Part
Survey Area Data: Version 6, Sep 16, 2025

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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.

Generated by eNDDDB on:
3/7/2026

Ian Cole
Towns: Ledyard
Preliminary Site Assessment: 1518612540

Subject: 54 SILAS DEANE RD

Current data maintained by the Natural Diversity Database (NDDDB) and housed in the DEEP ezFile portal, indicates that no populations of State Endangered, Threatened, or Special Concern species (RCA Sec. 26-306), and no Critical Habitats have been documented within or in close proximity to the area delineated.

Please be advised that this is a preliminary assessment and not a Natural Diversity Database determination. The purpose of this information is to provide a general planning tool which identifies those species that have been reported and may occur on or near the mapped area. A more detailed application and review will be necessary to move forward with any environmental authorization, permit, license, or registration applications submitted to DEEP. If such review is required, please return to the DEEP's ezFile Portal and select Natural Diversity Database Review to begin the review process.

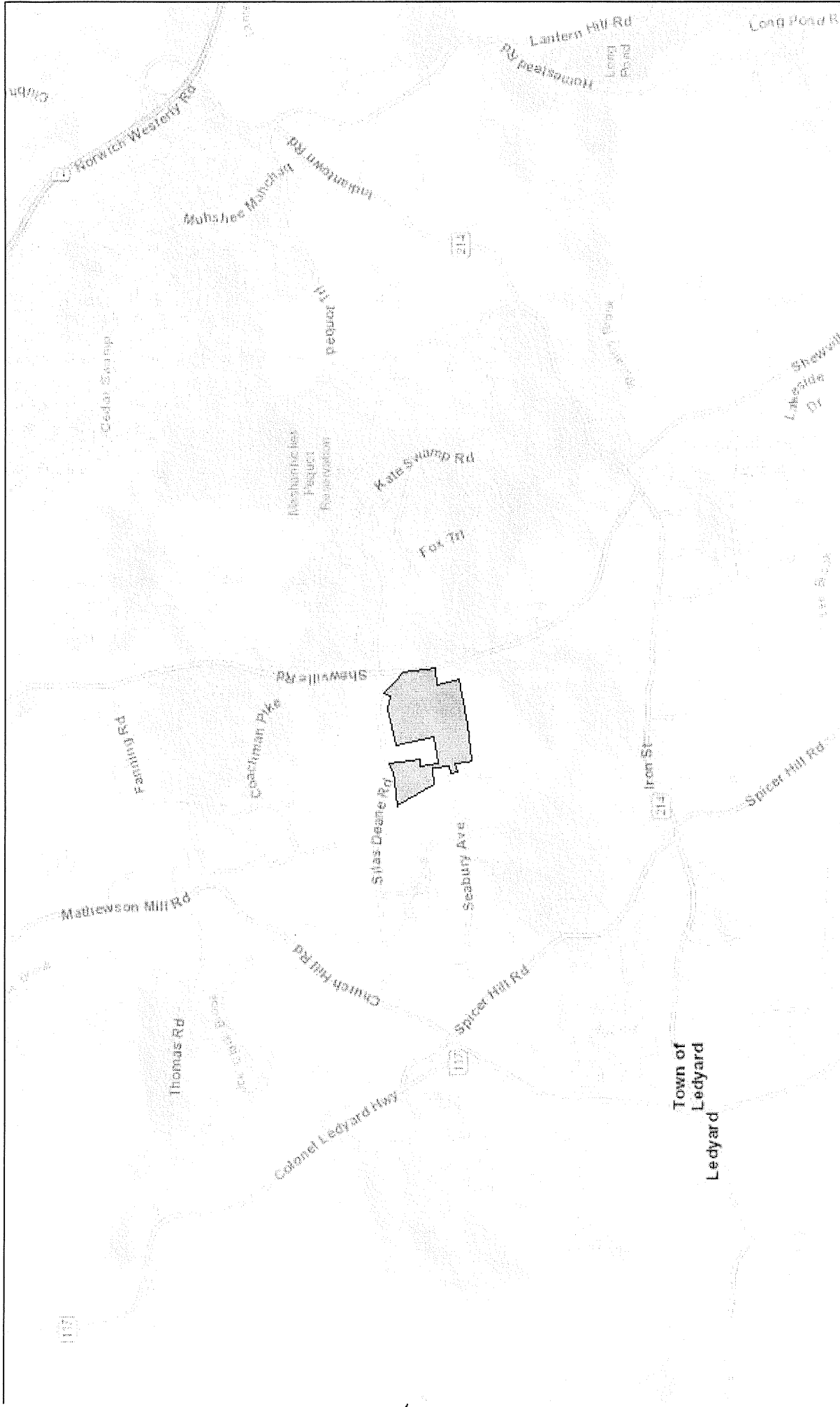
This Preliminary Site Assessment does not preclude the possibility that species not previously reported to the Natural Diversity Database may be encountered on the site. You are encouraged to report incidental observations to the Natural Diversity Database using the appropriate survey form and follow the instructions for submittal. We recommend field surveys be conducted in order to evaluate potential habitat and species presence. Field surveys should be performed by a qualified biologist with the appropriate scientific collecting permits at a time when these target species are identifiable. A report summarizing the results of such surveys should include:

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

The site surveys report should be sent to the CT DEEP-NDDDB Program (deep.nddbrequest@ct.gov) for further review by program biologists.

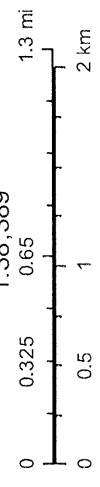
Natural Diversity Database information includes all information regarding listed species available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units

54 SILAS DEANE RD Map



, 2026

1:38,389



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community