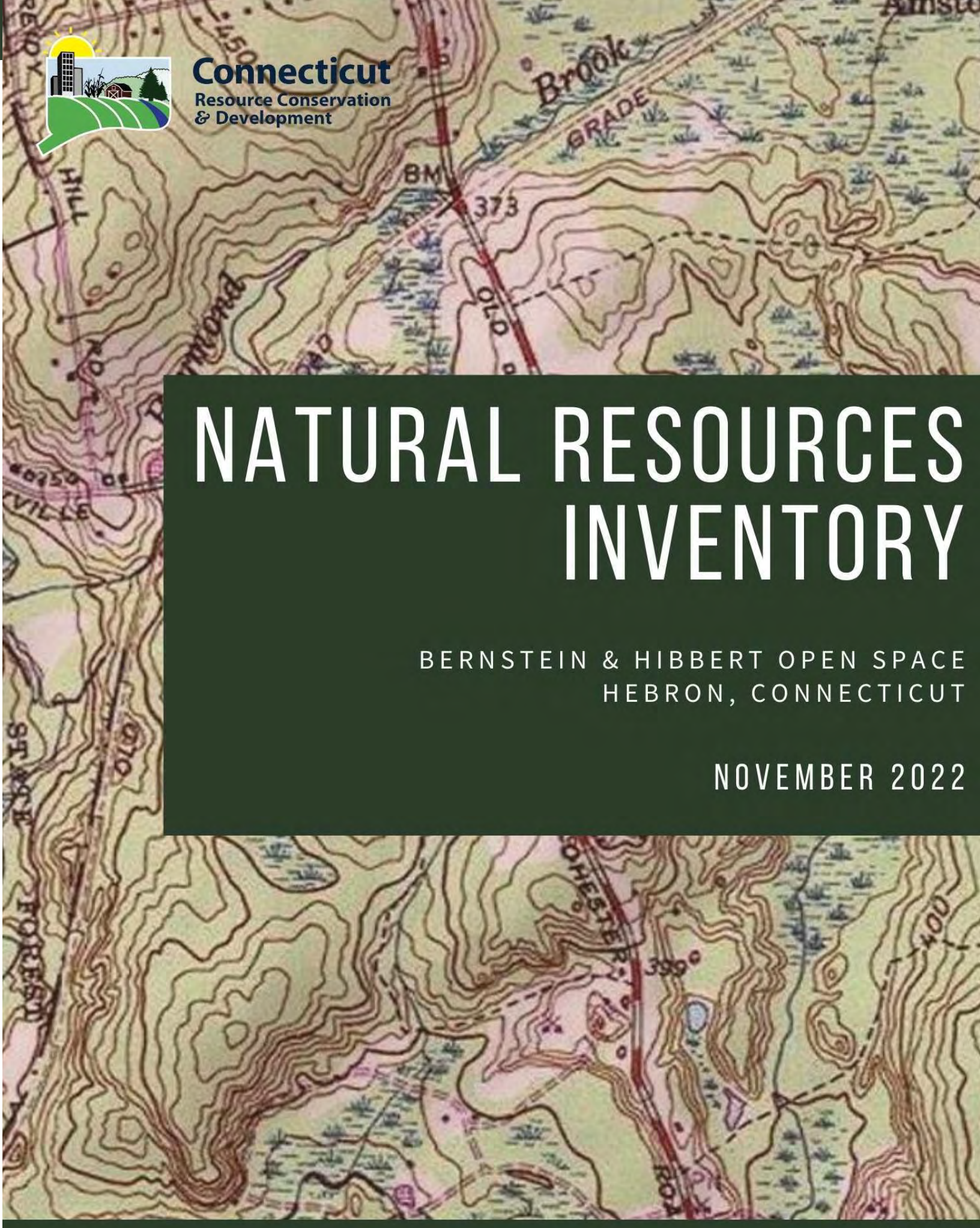

NATURAL RESOURCES INVENTORY

BERNSTEIN & HIBBERT OPEN SPACE
HEBRON, CONNECTICUT

NOVEMBER 2022

Hebron Officials with ERT Team 2021

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(All site photos were taken by CT RC&D staff unless stated otherwise. Cover photo provided by the USGS TopoView website)

Acknowledgments

This report is the product of a request from the Town of Hebron Conservation Commission to CT Resource Conservation and Development's (CT RC&D) Environmental Review Team (ERT) program. The CT RC&D Environmental Review Team program is a free service for Connecticut municipalities and land trusts to obtain baseline environmental data and best management practices for town properties or properties of significant interest for existing or future development or conservation. The ERT program is funded by the CT Department of Energy and Environmental Protection (CT DEEP) Passport to the Parks Program as well as CT RC&D.

CT RC&D would like to acknowledge and express their appreciation for the important work of the following Environmental Review Team members. Their professionalism and expertise were critical to the analysis of the Bernstein property for the Hebron Conservation Commission.

The field reviews were conducted from September 2021 through September 2022.

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Randy Steinen	Geologist Connecticut Geological Survey, CTDEEP
Kelly Starr	Natural Resource Specialist CT River Coastal Conservation District https://www.conservect.org/ctrivercoastal/

Invasive Species Management Overview and Pollinator Pathway guidance was derived from expertise provided in past projects by **Todd Mervosh and Dr. Charlotte Pyle**, specialists in this subject area. They are leaders in the Connecticut Invasives Plants Working Group and for more specific management should be consulted. https://cipwg.uconn.edu/

We'd also like to thank James Cordier, Conservation, Craig Bryant, Patrick Gallagher, Ann and Frank Zitkus, Dick Symonds, for their cooperation, patience, and assistance during this uniquely complicated ERT review process. Also want to recognize Bob Belletzkie who provided historical context and information to help shape overall recommendations.

Prior to the review day, each Environmental Review Team member receives a summary of the proposed concepts or projects anticipated for the property along with various information and geographic information maps. Some team members made separate visits to the site following the initial ERT review. Reports from each team member were submitted to the CT RC&D Environmental Programs Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site plans or detailed solutions to development problems. The Team does not recommend what final action should be taken on a property– all final decisions rest with the town and as appropriate the current property owner. This report identifies the existing resource base and evaluates its significance to potential continued conservation management and suggests considerations that should be of concern to the town. The results of

this Team action are oriented toward the development of better environmental quality and the long-term economics of nearby land use.

An additional valued resource for conservation information is the Connecticut River Coastal Conservation District. https://www.conservect.org/ctrivercoastal/

The CT RC&D Council hopes you will find this report of value and assistance in providing information to the Hebron Conservation Commission. If you require additional information, please contact:

Connecticut Resource Conservation and Development
Admin@ctrcd.org
P.O. Box 70
Haddam, CT 06438
860-345-3977

Introduction

The Town of Hebron reached out to CT RC&D Environmental Review Team to gain insights and participate in the ongoing effort to create a Master Plan of the Air Line Trail which would promote the significant cultural, recreational, environmental, and economic benefits of the Air Line Trail. As the CT RC&D is reviewing critical natural resource areas along the Air Line State Park Trail, the Town requested an environmental inventory of the “Hibbert” and "Bernstein” properties which abuts approx. 3,300 feet of the Air Line Trail and connects with other open space areas: State-owned Salmon River State Forest, Town-owned Grayville Falls Park and Grayville Estates open space, and privately-owned Camp Connecticut campground, to create an extensive area of undisturbed open space. The property's southern boundary lies 1,800 feet along Judd Brook, a tributary of the Class A Jeremy River.

Extensive and visible historical stone foundations, instrumental in the construction of the Air Line Railroad, are found along this section of the Judd Brook. The Town is purchased this property with assistance from a recently awarded DEEP Open Space and Watershed Land Acquisition Program (OSWA) grant based on the property's high natural resource and recreational value, climate change mitigation, public access, and the Town's past OSWA grant compliance. Trails, possibly "blue-blazed," leading from surrounding preserved open space and residential areas into the property are desired to link with the Air Line State Park Trail. The Hebron Conservation Commission wishes to maximize the environmental, recreational, and educational assets of this valuable property as well as the benefits that arise from its position along the Air Line Trail and connection with other very significant State and Town-owned open space and approved the request for this ERT at its February 11, 2021 meeting.

The specific issues the Town wanted to address in the ERT report include:

- Land Use Context
- Soils
- Topography
- Agriculture
- Water Quality
- Traffic and Access
- Geology
- Vernal Pools/ Wetlands
- Wildlife/Herpetology
- Vegetation
- Invasive Species -Pollinators
- Watershed
- Historic Value

This ERT report is provided to help land use professionals, stakeholders, land trust and town officials make environmentally responsible decisions toward future management of these current parcels.

Watershed Analysis

Kelly Starr
Natural Resource Specialist, CT River Coastal Conservation District

Overview of Watersheds and Best Management Practices for Water Quality Protection

The Bernstein Property is located within the Jeremy River, Raymond Brook, and Judd Brook subregional basin/watersheds. The Hibbert property is located within the Jeremy River and Raymond Brook subregional basin/watersheds. These smaller basins/watersheds are located within and contribute to the regional basin, the Salmon River Watershed. The Jeremy River Watershed is the largest of the three watersheds, approximately 12.87 sq. acres, followed by Raymond Brook Watershed 9.04 sq. acres, and Judd Brook Watershed 5.11 sq. acres. The Salmon River Watershed and all the contributing basins/watersheds are located in the Connecticut River Major Basin.

The land cover of the watershed is mixed, according to the University of Connecticut Environmental Conditions Online, Land Cover and Change GIS data layer (https://cteco.uconn.edu/ctraster/rest/services/landcover). The land cover data are from 2015 and presented by basin, which includes: the Jeremy River, Judd Brook, Raymond Brook, Meadow Brook, and Pine Brook subregional basins. Although the data are a few years behind, they still provide a good baseline for the land cover and how it has changed. The majority of the basin where the properties are located is forested (65-75%), followed by developed (15.1- 20%), impervious cover (6-10%), agriculture fields (4.1 -8%), and turf and grass (3.1-8%). The GIS data layer also provides information for the percent land cover change for 1985 to 2015. In that 30 year time span, the forest cover decreased (5.0 - 9.9%), impervious cover increased (0.6 -1%), agricultural fields decreased (15.5-29.9%), and turf and grass increased (50.1-75%). The basin area that was mapped surrounding the properties is predominantly forested and undeveloped, which has a considerable impact on protecting water quality.

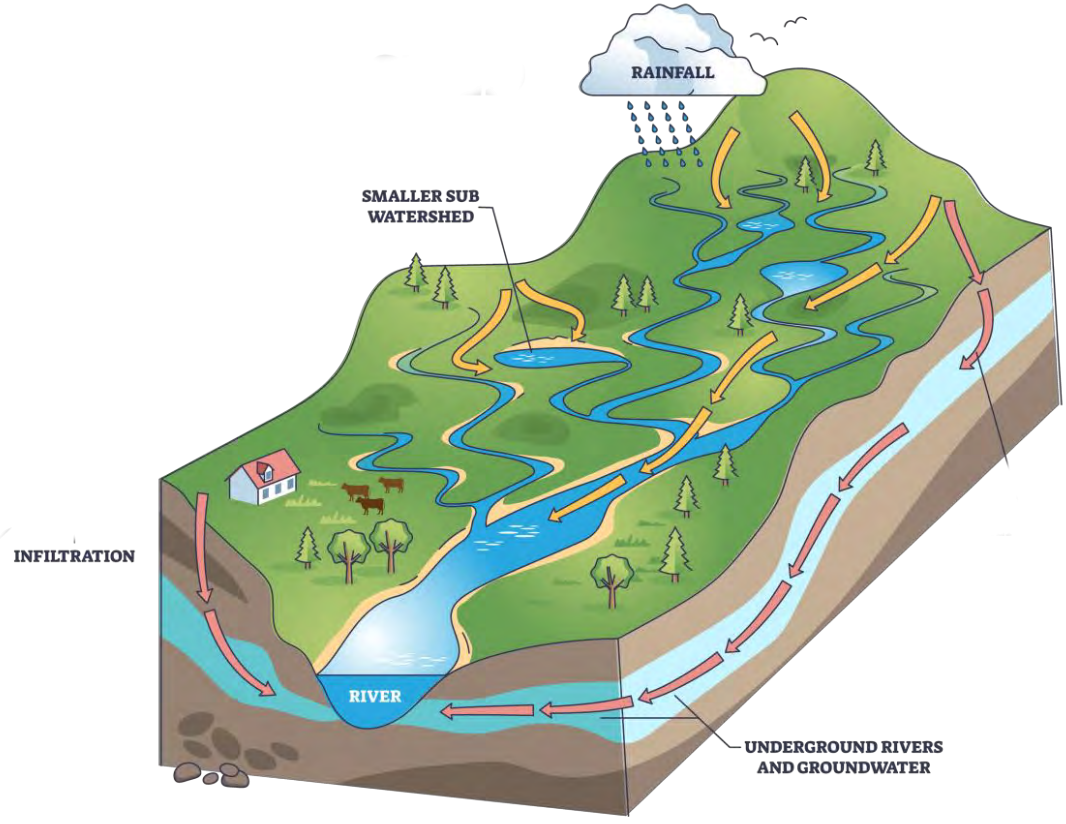
However, as in any watershed, an increase in development and changing landscapes have one of the biggest impacts on water quality. When an area is developed, the natural drainage changes, impervious surfaces concentrate the stormwater, preventing infiltration and increasing the amount of water that is flowing across the ground surface, picking up pollutants and sediment that will eventually flow into receiving waters. The changes in infiltration also

affect groundwater recharge and the base flow of streams, and contribute to an increase in flooding, especially downstream.

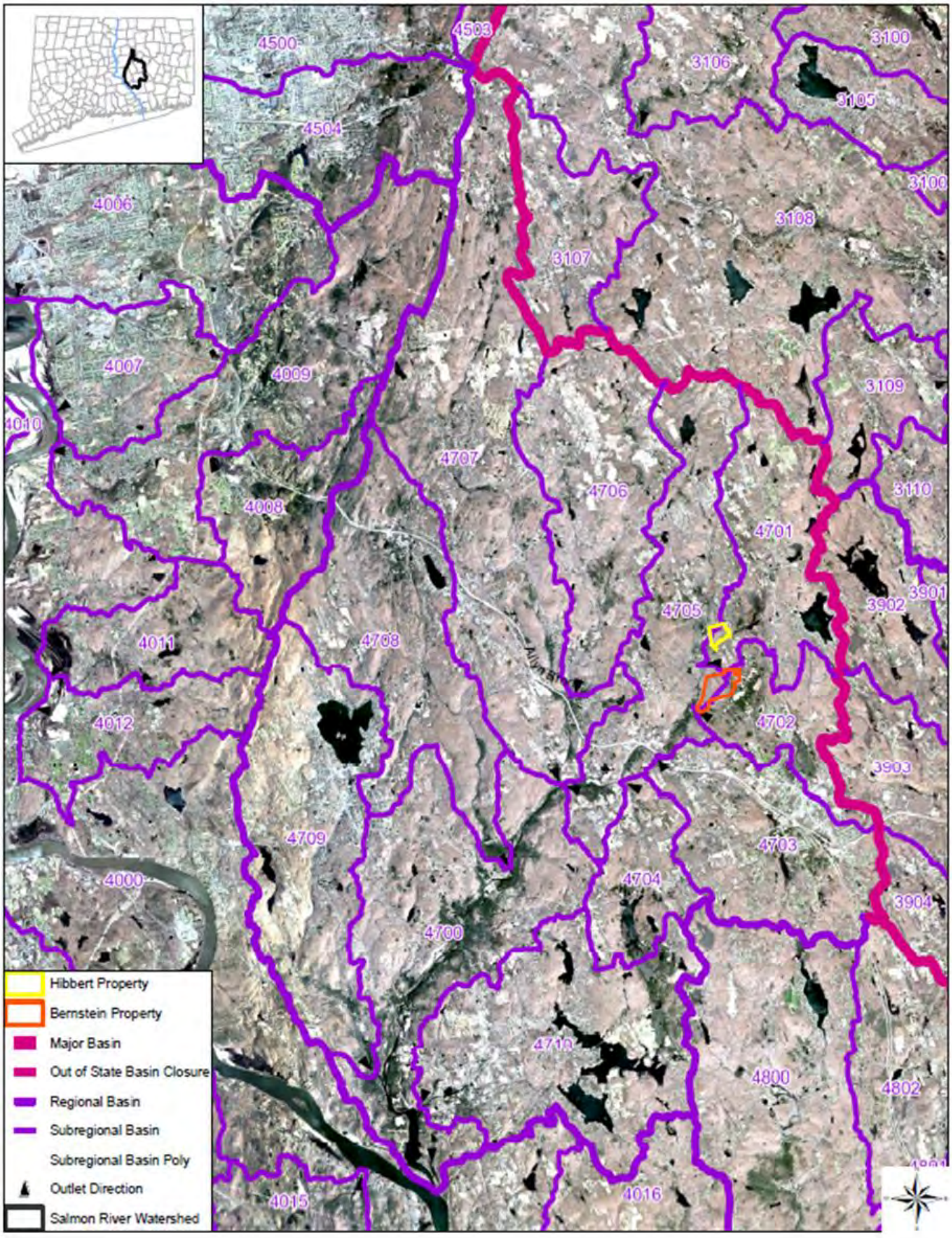
Land development is going to continue within the watershed, but there are ways that it can be balanced in order to protect water resources and water quality. When development is proposed, the pre-development drainage should be maintained by reducing impervious surfaces and incorporating Low Impact Development (LID) practices or green infrastructure that will allow the stormwater to filter into the ground close to the source. Site development plans need to be reviewed to ensure these practices are incorporated to reduce stormwater runoff and prevent erosion and sedimentation and other water quality impacts. Also, maintaining vegetated buffers along watercourses and sensitive natural areas is critical to help protect water quality by reducing erosion; and filtering sediment and nutrients/pollutants by slowing the flow of surface water, allowing sediment and other pollutants to settle out and be trapped before reaching the watercourse.

With careful planning that considers the overall cumulative impacts of development within the watershed, a balance can be achieved where development can occur, and water quality and natural resources are protected. Water quality/water resources can also be protected on an individual level by residents in the watershed and promoted through education and outreach. For example, the Connecticut River Coastal Conservation District's Backyard Water Resources Guide includes a variety of actions that can be taken by residents/landowners in the watershed to protect the health and quality of backyard streams, ponds, lakes, and wetlands.

This guide offers many simple, safe, and environmentally sound practices for lawn and landscape care, septic system maintenance, hazardous household product use, erosion prevention and stormwater runoff control. The intent of this educational tool is to build community awareness and appreciation for protecting local and regional water resources, and to promote individual backyard stewardship. Hard copies are available for distribution from the conservation district office (ctrivercoastal@conservect.org or 860-346-3282).



Location of the Hibbard and Bernstein Properties in the Salmon River and Subregional Basins
4705 Jeremy River Watershed
4701 Raymond Brook
4702 Judd Brook



Geology

Randolph Steinen
Geologist, Connecticut Geological Survey (Retired CTDEEP)

Topography

Raymond Brook enters the Hibbert open space property at roughly 360 ft elevation and flows into Jeremy Brook, which drops to about 250 ft at the south side of the Bernstein open space parcels, a distance of a little less than 2 miles (see topographic map presented earlier in this report). The hillsides along its valley are gently sloping and rarely rise to more than a hundred feet above the level of the water courses. Maximum elevation in the Hibbert space is just over 450 feet. The Airline Trail and trails within the adjacent open space areas are all relatively gentle also and can be traversed by hikers of all abilities. The Airline Trail is wheel-chair accessible, but the side trails are not.

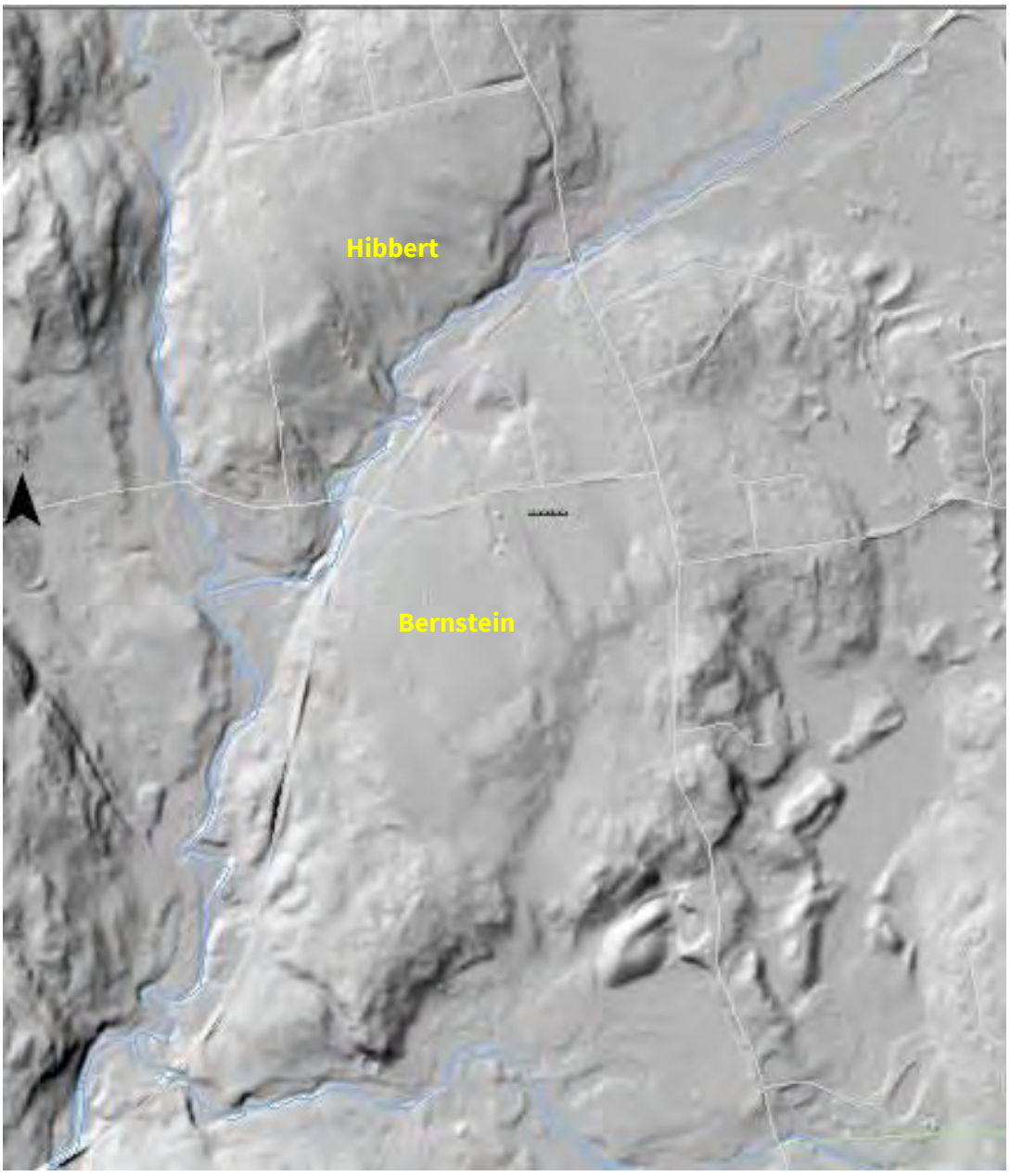


Figure 1. LiDAR image of Hibbert and Bernstein Open Space parcels. LiDAR is a radar generated image of the earth-surface that appears like a black and white photograph without forests (radar penetrates the canopy) or buildings (computer processing removes regular geometric objects). LiDAR gives the observer a feel for the lay of the land. The smooth areas are covered by glacial soils referred to as till. Dark shadowed areas have steeper relief, in some places caused by rock outcrops and in other places by steep-sided deposits of sand and gravel, some of which were generated by mining in the southeastern corner of the Bernstein parcels. Map width is approximately 1.5 mi.

Quaternary Geology. Figure 1 is a LiDAR image of the Hibbert/Bernstein open space parcels that shows the topography to be generally fairly smooth. This is a result of glacial erosion/deposition during the last Ice Age. Glacial ice cannot support its own weight if the ice is greater than several hundred feet thick. In that case the glacial-ice flows, downhill if it's on a mountain-side or from areas where the ice is thicker toward areas of thinner ice (usually this is toward the edge of the ice) if it's on a continent. The ice flowed from north-northwest toward south-southeast in most of Connecticut. As the ice flows it scrapes the rock, eroding high areas and smoothing the topography. The ice then deposits the eroded debris, in localized places beneath the moving ice, but over all the land when it melts. The rocky glacial soils of New England are a product of glacial erosion and deposition. Melt water streams eroded the glacial soils in some places and deposited sand and gravel in others.

Most of the area of both the Hibbert and Bernstein parcels is covered by a glacial soil referred to as till (Figure 2), the debris left when the ice melted. As such, till covers almost all of the bedrock (ledge) in this area. The till mostly is 5-10 feet thick, but in places may be 15 feet or more thick.

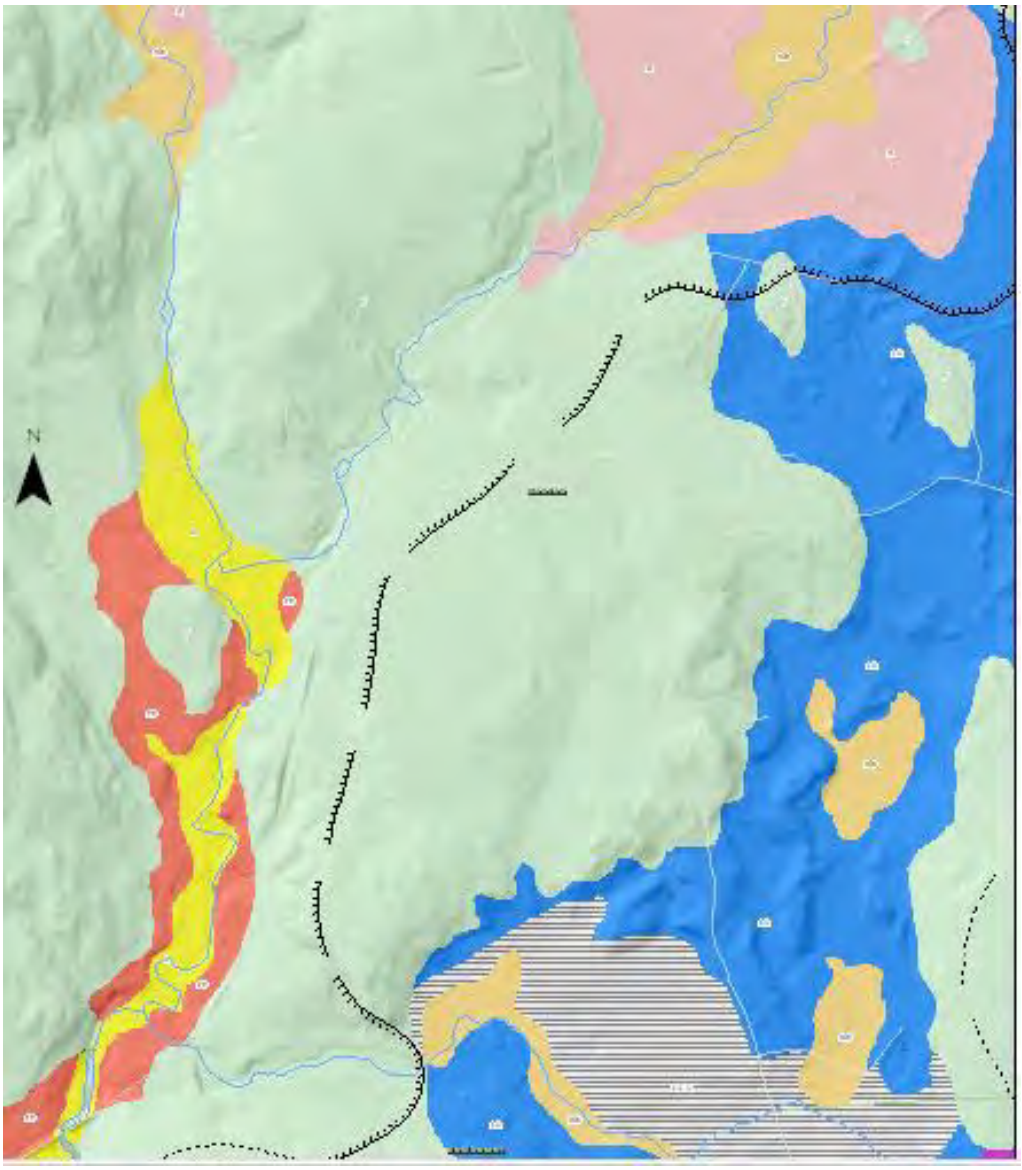


Figure 2. Map showing glacial deposits from Stone and others, 2005. Green area is covered by glacial till. Yellow area is modern river alluvium. All other colors are various sand and gravel deposited by meltwater streams. Black hachured line is an interpreted edge of glacial ice approximately 19,000 years ago.

Sand and gravel deposits are found on the Bernstein parcels and locally in the stream and river valleys on the Hibbert parcel (Figure 2). The sand and gravel have been extensively mined in the southeastern part of Bernstein area.

Bedrock Geology. The entire area reportedly is underlain by rocks of the Hebron Gneiss and irregular areas of pegmatite (Lundgren and others, 1971; Rodgers, 1985). The gneiss is Siluro-Ordovician in age (440-450,000,000 +/- years; Rodgers, 1985). It is fairly widespread in the central part of eastern Connecticut. Bedrock (ledge) composed of Hebron Gneiss, however, is not widely exposed on the subject parcels and was seen at only two locations during field investigations in the Fall, 2021: along Raymond Brook at a damsite on the Hibbert parcel (additional outcrops can be found along the trails in the Hibbert parcel) and along the Airline Trail at a tributary stream crossing at the south-western corner of the Bernstein parcels. No other outcrops were found on the Bernstein property. LiDAR imagery (Figure 1) suggested that outcrops likely were not exposed, and the parcel was not extensively explored.

The Hebron Gneiss is not very resistant to erosion and in most places is covered by unconsolidated deposits left by glaciers at the end of the last Ice Age. It contains irregular pods and layers of pegmatite, which are resistant to erosion; most outcrops of Hebron Gneiss are found associated with the pegmatite. Good exposures of the Hebron Gneiss may be found along near-by highway road cuts (Figure 3), Connecticut Route 2 to the south and U.S. Route 6 to the north. Those road-cut exposures show that the gneiss is layered, gray, and contains prominent pods and lenses of pegmatite, white areas in the illustrations.

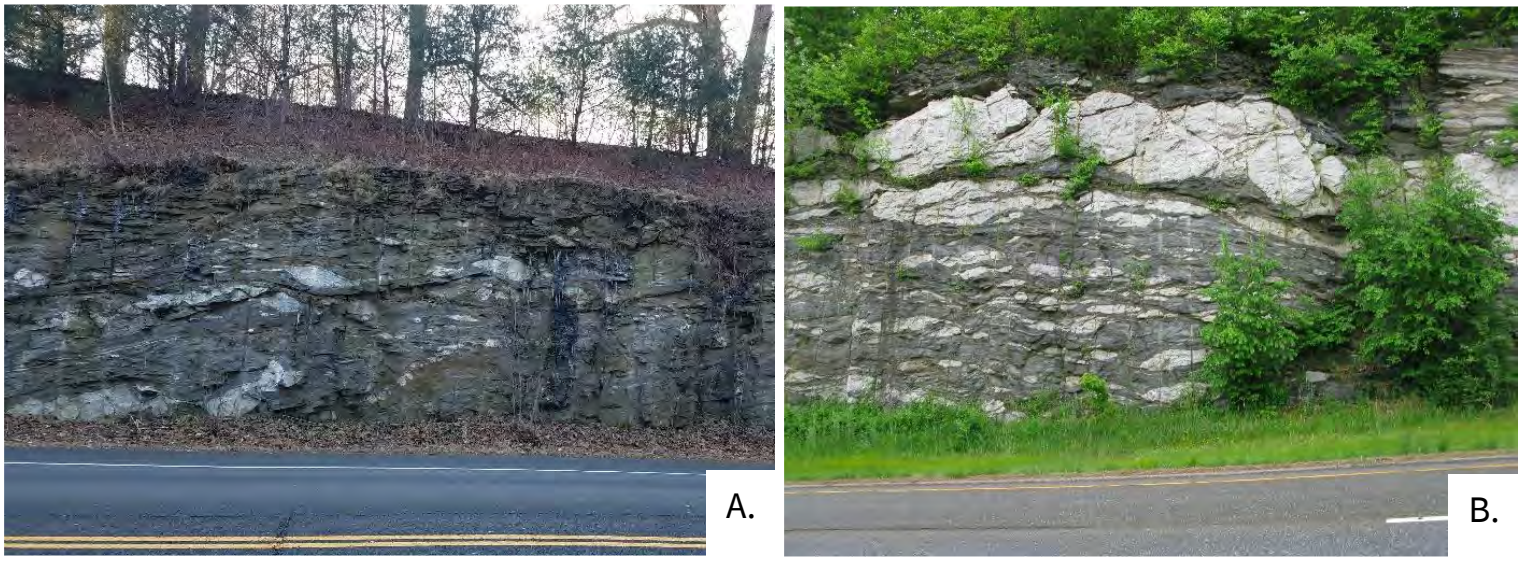


Figure 3. Road-cut outcrops of Hebron Gneiss exposed along nearby highways. White pods on the rock are pegmatite, gray layered rock is Hebron Gneiss. A. U.S. Route 6 roadcut in Andover, CT. Outcrop height approximately 8 ft. B. Connecticut Route 2 roadcut near Salem, CT. Outcrop height approximately 8 ft.

The gneiss is fine- to medium-grained, gray to greenish gray calc-silicate gneiss and quartz-biotite schist and schistose gneiss (Figure 4A., B.). The calc-silicate rock contains calcic-plagioclase feldspar, quartz, brown biotite mica, and calcic amphibole and pyroxene. The interlayered quartz-biotite schist contains quartz, brown mica, and minor plagioclase feldspar. Most layers of calc-silicate and schist are inches thick, but individual layers may be more thinly laminated. They are interlayered in most outcrops, but one or the other may predominate. On the Hibbert parcel, only quartz biotite schist was found associated with the pegmatite. Calc-silicate rocks were only seen as loose fragments in the glacial soils. The pegmatite pods consist of coarse-grained quartz and potassium feldspar with minor plagioclase feldspar and traces of mica (Figure 4C.), usually biotite in the Hibbert parcel (biotite is reported also in adjacent areas by Lundgren and others, 1971, p. 11-12). Pegmatite pods are poorly foliated, where seen on the Hibbert parcel.
The overhanging rock on the northwest side of Raymond Brook on the Hibbert parcel is the main area of outcrop and the only one studied in the area of the Hebron section of the Airline trail. There, layer-like pods of pegmatite hold up outcrops where the pegmatite is in contact with the Hebron Gneiss (Figure 5)

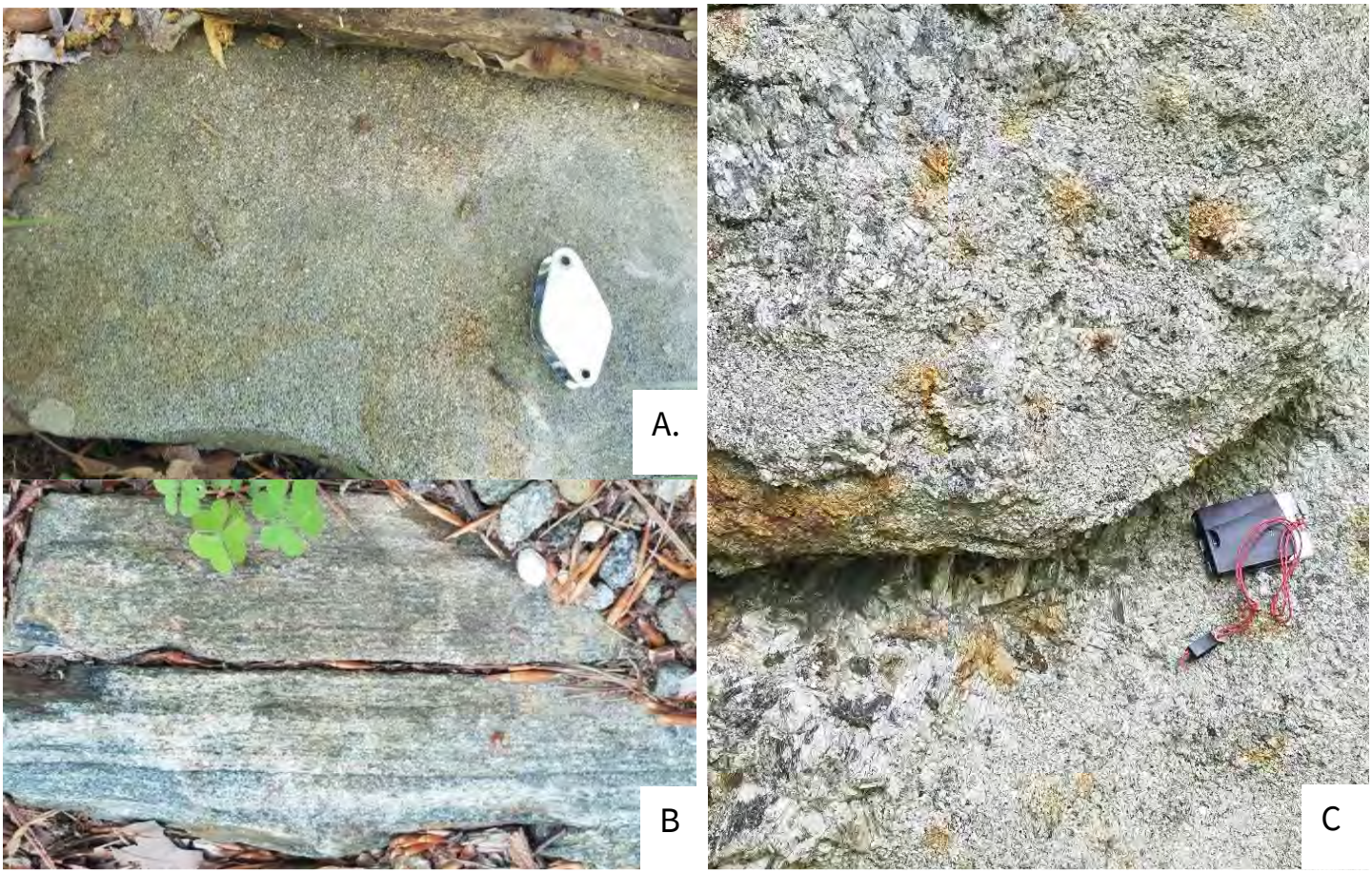


Figure 4. Representative samples of Hebron Gneiss (A., B.), and pegmatite (C.). A. Loose piece of quartz-biotite gneiss, looking on a foliation plane; rock would appear layered if looking perpendicular to foliation plane. Dark mineral grains are biotite mica. Lighter material is mostly quartz, and perhaps some plagioclase feldspar. Hand-lens is 1.5 inches (4 cm) long. B. Calc-silicate gneiss; looking at a cross-section (i.e. perpendicular to foliation planes) of a loose specimen. Greenish layers contain calcium bearing amphibole and/or pyroxene the gray layers contain feldspar, quartz and biotite mica. Oxalis leaves for scale. C. Large glacial boulder of pegmatite. Larger white crystals composed microcline feldspar. Small gray areas are quarts. Black minerals are biotite. Black compass is 2.5 inches wide.

Figure 5. Outcrop images of Hebron Gneiss and associated pegmatite at the Hibbert Open Space Parcel. A. Low outcrop of pegmatite with calc-silicate gneiss (covered by mosses). Outcrop is north of overhanging outcrop on the Mill-Site Path shown on Old Hibbert Property Trail map. Open compass on outcrop is 8.5 inches (21 cm) long. B. Overhang outcrop shown on trail map. Most of the outcrop is formed by pegmatite. Hebron Gneiss is below the pegmatite and forms part of the overhang and also on top of the pegmatite in the form of several thin layers. Outcrop height about 8 feet (almost 3 m.). C. Pegmatite layer on west side of Raymond Brook just upstream from former dam location. In distance the white layer is pegmatite, the moss covered layer below white layer is calc-silicate gneiss. D. Pegmatite layer on west side of Raymond Brook upstream from Figure 4C. Top of outcrop about 10 feet above river level.

References.

Lundgren, L., Jr, Ashmead, L, and Snyder, G.L., 1971, The bed rock geology of the Moodus and Colchester quadrangles: Connecticut Geological and Natural History Survey Quadrangle Report #27, 24p.

Rodgers, John, 1985, Bedrock Geological Map of Connecticut. State Geological and Natural History Survey of Connecticut, Nat'l. Resource Atlas Series, 1:125,000, 2 sheets.

Stone, J.R., and others, 2005, Quaternary geologic map of Connecticut and Long Island Sound Basin. U.S.Geol.Survey Scientific Investigations Map 2784, scale 1:125,000

Soils and Wetlands

Edward Pawlak
Registered Soil Scientist- Certified Professional Wetland Scientist
Connecticut Ecosystems LLC

INTRODUCTION

Connecticut Ecosystems LLC inspected the Hibbert and Bernstein Open Space properties on several occasions in the spring of 2022: April 5 and 15, May 5, and June 10, in order to characterize the wetlands and watercourses contained therein, assess their functional values, and develop management recommendations for them.

BERNSTEIN OPEN SPACE PROPERTY

Soils

The NRCS Soils Map shows eight wetland soil map units on the Bernstein property: Ridgebury fine sandy loam (#2); Ridgebury, Leicester and Whitman soils (#3); Walpole sandy loam (#13); Scarboro muck (15); Timakwa and Natchaug soils (#17); Rippowam fine sandy loam (#103); Limerick and Lim soils (#107); and Saco silt loam (#108). These poorly or very poorly drained soils support large, wooded wetland systems that stretch across the property, and flank Judd Brook along the southern property boundary.

The majority of the wetland and non-wetland soils on the property were derived from glacial till parent materials, although some are derived from sand and gravel outwash or partially decomposed plant materials.

Wetland Characterization

The National Wetlands Inventory (NWI) Map shows the locations of the wetlands on the Bernstein property. Furthermore, this map characterizes these wooded wetlands as “Palustrine Forested Broad-Leaved Deciduous, Seasonally Flooded/Saturated”. This characterization was confirmed during the inspections of the Bernstein property.

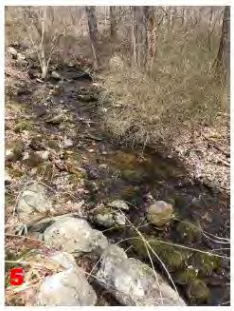
The wooded wetlands in the central portion of the Bernstein property occur on very gentle slopes, and as a result they contain extensive shallow inundation during the spring months (Photos 1-3). Within this matrix of shallow flooding are a number of “cryptic” vernal pools that contained Wood Frog and Spotted Salamander egg masses in the spring of 2022 (Photo 4).

The dominant vegetation in these wooded wetlands is red maple, sweet pepperbush, highbush blueberry, sphagnum moss and skunk cabbage.

The wetland corridor on the eastern half of the property contains a headwaters watercourse that flows in a southerly direction (Photo 5). The substrate in the lower reaches of this watercourse consists of cobbles, gravel and flat stones (Photo 6). Wetlands adjacent to this watercourse provide a source of clean, cool groundwater discharges

(Photo 7). Stoneflies and other pollution-intolerant benthic macroinvertebrates were collected during a “kick” sample of this watercourse (Photo 8). This headwater stream flows into a large wooded wetland south of the Bernstein property (Figure 1).

Bernstein Property Hebron, CT 4/5/2022 1-3: Cryptic vernal pools embedded within large seasonally floodedwooded wetland system 4. Wood Frog egg mass within cryptic vernal pool



Judd Brook flows along the southerly boundary of the Bernstein property. Riparian wetlands adjacent to the brook are limited due to topography. Stream surveys by the Connecticut Department of Environmental and Energy Protection Fisheries Division found the following species at a sampling location in Judd Brook immediately east of the Airline Trail: American Eel, Blacknose Dace, Longnose Dace, Common Shiner, Fallfish, and Atlantic Salmon (stocked). The presence of American Eel is of particular note. This catadromous fish lives in freshwater and breeds in marine water.

Bernstein Property Hebron, CT 4/5/2022 5. Headwaters stream with a high gradient channel in its lower reach 6. Gravel, cobble and flat stone substrate in headwaters stream 7. Active groundwater discharge in wetland adjacent to headwaters stream 8. Stonefly collected from headwaters stream

A small former agricultural pond is located on the eastern end of the property, adjacent to Old Colchester Road (Photo 10). Much of its surface was covered with duckweed, indicating a high nutrient level.

Bernstein Property Hebron, CT 6/10/2022 9. Judd Brook 10. Former agricultural pond

Wetland Functions and Values

The wetlands on the Bernstein property provide a variety of functions/ecological services:

- Groundwater Discharge and Recharge - Active wetland groundwater discharges support the baseflow of the headwaters stream described above, and ultimately Judd Brook, to which it is tributary. These groundwater discharges also modulate the water temperature of these resources, which is critical to the aquatic organisms that live there. Groundwater recharge likely occurs in the wetlands during the drier summer months, when the groundwater table is lower and does not preclude infiltration.

- Floodflow Alteration - The large gently sloping, densely vegetated wetlands detain and slowly release a significant amount of stormwater, protecting downstream structures.

- Pollutant Removal - The gentle slopes and dense vegetation that characterize the wooded wetlands remove a variety of solid and dissolved pollutants from stormwater runoff.

- Production Export - Biomass generated by the dense vegetation in the wetlands decompose and is seasonally exported into Judd Brook, supporting the biota in the river and in downstream aquatic systems.

- Wildlife Habitat – The “cryptic” vernal pools in the wooded wetlands support the breeding and development of Wood Frogs and Spotted Salamanders. The headwaters stream likely provides habitat for aquatic salamanders such as the Two-Lined Salamander and the Northern Dusky Salamander. Numerous songbirds were observed throughout the Bernstein property.

- Finfish Habitat (Judd Brook) – CTDEEP has documented a diverse finfish community within this perennial watercourse. The presence of American Eel in Judd Brook is significance, as it suggests a lack of migration barriers (i.e., culverts, dams) between Judd Brook and the Long Island Sound.

- Recreation – A trail that leads east from the Airline Trail, and which runs roughly parallel to Jordan Brook, provide excellent views of the brook.

- Educational/Scientific Value – All of the wetland and upland habitats described above could potentially serve as educational sites for a variety of investigations, including wildlife studies, functions and values of headwater streams, and a vernal pool ecology.

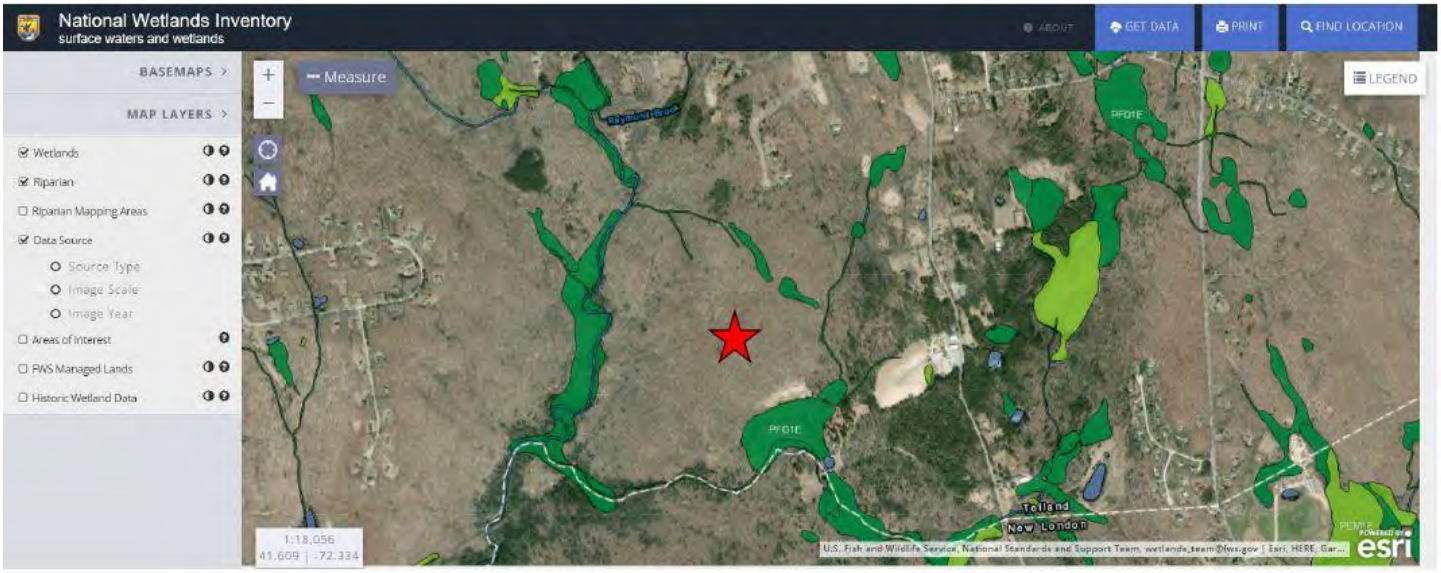


Figure 1. Bernestein Open Space Property NWI Map
Hebron, CT
Connecticut Ecosystems LLC
June 18, 2022

HIBBERT OPEN SPACE PROPERTY

Soils

The NRCS Soils Map shows three wetland soil map units on the Hibbert property: Ridgebury, Leicester and Whitman soils (#3); Timakwa and Natchaug soils (#17); and Fluvaquents-Udifluvents complex (#109). These poorly or very poorly drained soils support large wooded wetland systems that extend east of the Airline Trail.

The Fluvaquents-Udifluvents complex soils are derived from alluvial materials. The Timakwa and Natchaug soils were formed from partially decomposed plant materials. The remaining soils on the property were derived from glacial till parent materials

Wetland Characterization

The National Wetlands Inventory (NWI) Map shows the locations of the wetlands on the Hibbert property. Furthermore, this map characterizes these wooded wetlands as “Palustrine Forested Broad-Leaved Deciduous, Seasonally Flooded/Saturated”. This characterization was confirmed during the inspections of the Hibbert property.

Several large riparian wetlands occur south of and adjacent to Raymond Brook (Photo 15). Wood Frog egg masses were identified in one of these a cryptic vernal pools (Photo 16). Several of the riparian swamps contain headwater streams that discharge cool, clean water into Raymond Brook (Photo 17). A Two-Lined Salamander was found in one of these streams beneath a large flat stone.

Hibbert Property Hebron, CT 4/15/2022 Raymond Brook 11. Boulder and cobble riffle 12. Large pool formed at sharp bend in channel 13. Undercut bank 14. Sedge marsh adjacent to channel

Raymond Brook

Raymond Brook flows westerly across the Hibbert property. This watercourse is characterized by alternating fast-flowing riffles (Photo 11) and large pools or runs (Photo 12). American Toads were trilling within these pools along the entire reach of Raymond Brook on the property.

Undercut banks were common along Raymond Brook (Photo 13). A large sedge marsh lies adjacent to the brook on the northern end of the property (Photo 14).

Hibbert Property Hebron, CT 5/5/2022 15. Large riparian wooded swamp dominated by skunk cabbage in the understory 16. Seasonally

Stream surveys by CTDEEP Fisheries Division found the following species at a sampling location in Raymond Brook on the Hibbert property: American Eel, Bluegill Sunfish, Brook Trout (stocked), Brown Trout (stocked), Blacknose Dace, Longnose Dace, Chain Pickerel, Pumpkinseed and White Sucker. The presence of American Eel in the brook is significant, as noted above for Judd Brook.

Wetland Functions and Values

The wetlands on the Hibbert property provide a variety of functions/ecological services:

- Groundwater Discharge and Recharge - Active wetland groundwater discharges within headwaters streams support the baseflow of Raymond Brook, to which the streams are tributary. These groundwater discharges also modulate the water temperature of these resources, which is critical to the aquatic organisms that live there. Groundwater recharge likely occurs in the wetland during the drier summer months, when the groundwater table is lower and does not preclude infiltration.

- Flood flow Alteration - The large gently sloping, densely vegetated wetlands detain and slowly release a significant amount of stormwater, protecting downstream structures.

- Pollutant Removal - The gentle slopes and dense vegetation that characterize the wooded wetlands remove a variety of solid and dissolved pollutants from stormwater runoff.

- Production Export - Biomass generated by the dense vegetation in the wetlands decompose and is seasonally exported into Raymond Brook, supporting the biota in the river and in downstream aquatic systems.

- Wildlife Habitat – The "cryptic" vernal pool in the wooded wetland supports the breeding and development of Wood Frogs. A Two-Lined Salamander was observed within one of the headwater streams on the property. Numerous songbirds were observed throughout the Hibbert property.

- Finfish Habitat (Streams and Rivers) – CTDEEP has documented a diverse finfish community within this perennial watercourse. The presence of American Eel in Raymond Brook is significant, as noted above for Judd Brook.

- Recreation – A gravel road trail that provides access to the property from Old Colchester Road provides excellent views of Raymond Brook.

- Educational/Scientific Value – All of the wetland and upland habitats described above could potentially serve as educational sites for a variety of investigations, including wildlife studies, functions and values of headwater streams, and a vernal pool ecology.

Landscape Context

It is important to consider the larger landscape in which the two subject properties are located. This landscape block, approximately 2,800 acres in size, is shown in Figure 3. It is bounded to the north by Hope Valley Road, to the east by Old Colchester Road, to the south by Old Hartford Road, and to the west by Jones Street. It includes two lightly traveled roads – Reidy Hill Road and Grayville Road. This landscape block is almost entirely wooded, and includes three significant perennial watercourses: Raymond Brook, Jeremy River, and Judd Brook.

Many wildlife species that are declining or rare in Connecticut require large unfragmented landscape blocks to supply their habitat requirements for breeding, nesting, feeding, cover, overwintering, etc. Examples of these "area - dependent" species include Eastern Box Turtle, Wood Frog, Bobcat and Ovenbird.

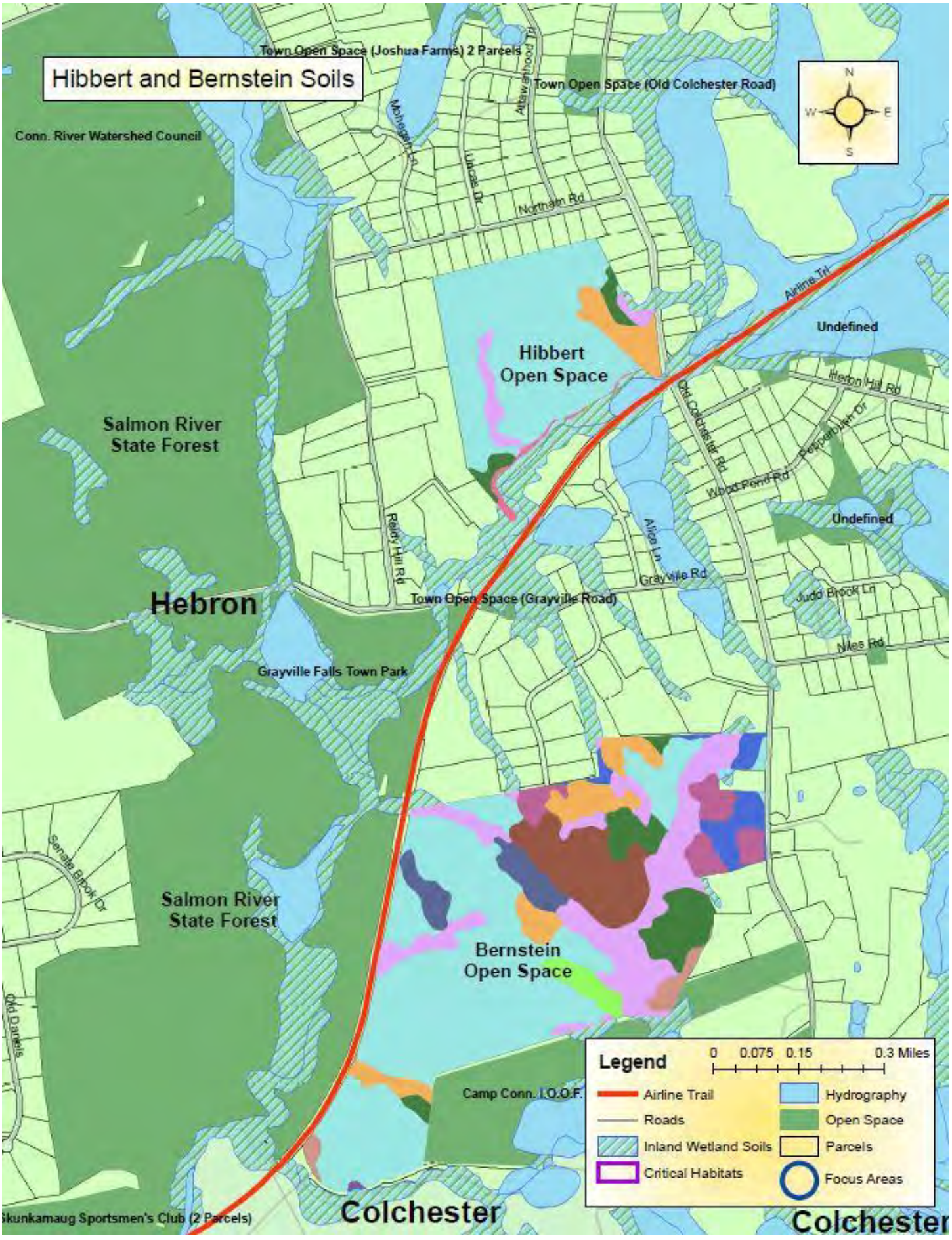
Large, wooded unfragmented landscape blocks are essential for the health and ecological integrity of perennial and seasonal watercourses, and all of the biota that they support.

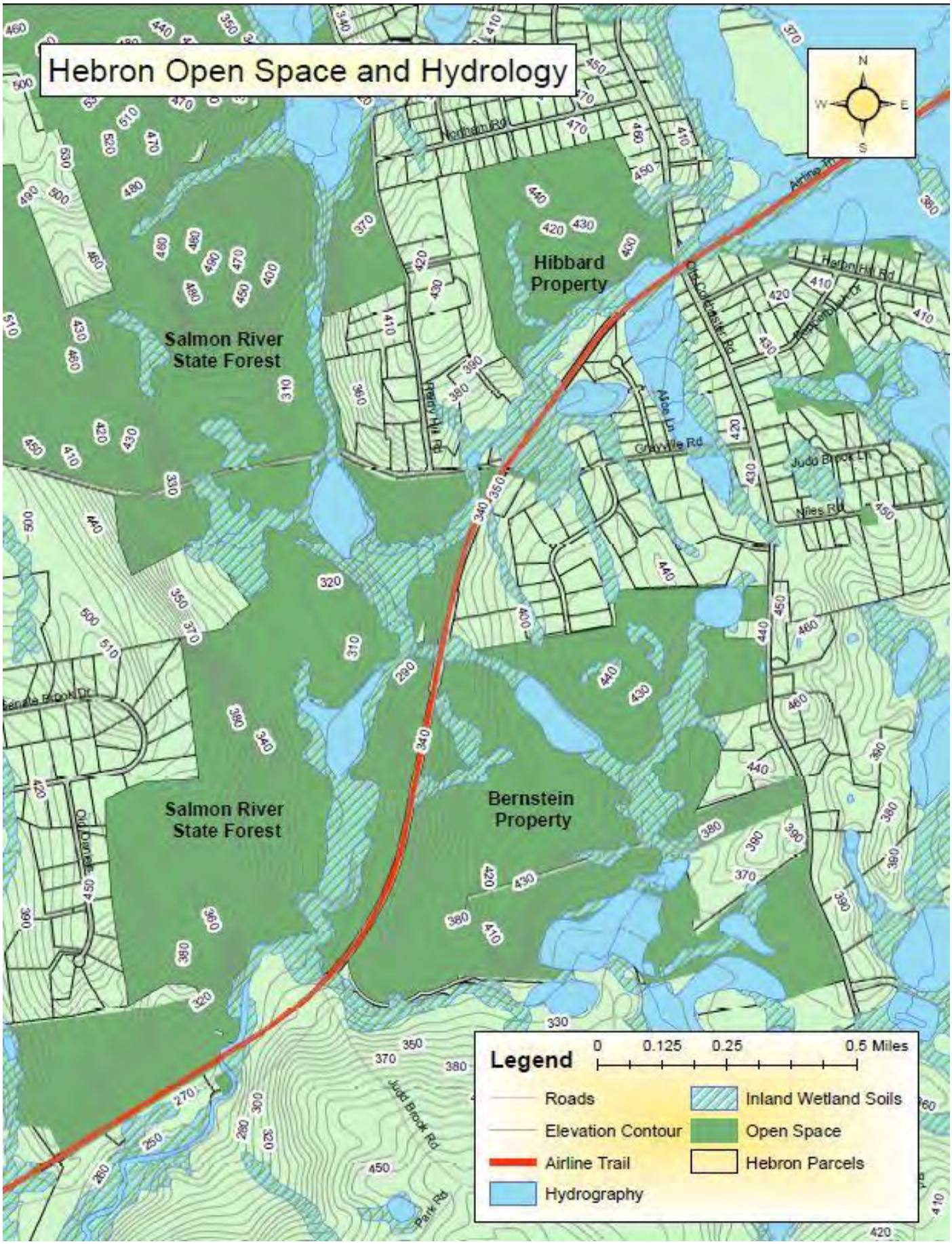
The two subject properties are critical elements of this approximately 2,800 acre lightly fragmented landscape block.

Management Recommendations

It is strongly recommended that the forest canopy that covers most of the two subject properties be maintained. An existing trail on the southern portion of the Bernstein property provides excellent views of the adjacent Judd Brook. This trail should be maintained and perhaps enhanced with the addition of informational signage.

The headwaters watercourse that flows south through the central portion of the Bernstein property is flanked by a zone of very dense invasive shrubs (Japanese Barberry and Multiflora Rose). Consideration should be given to a multi-year program to remove these invasive shrubs and slowly, over time replace them with native shrubs.


Hibbert and Bernstein Soils
Town Open Space (Joshua Farms) 2 Parcels
Town Open Space (Old Colchester Road)
Conn. River Watershed Council
Mohegan Ln
Lucas Dr
Attawaugan Trl
Northern Rd
N
W
E
S
Airline Trl
Undefined
Hibbert
Open Space
Heron Hill Rd
Old Colchester Rd
Pepperbush Dr
Wood Pond Rd
Salmon River
State Forest
Rocky Hill Rd
Alice Ln
Undefined
Grayville Rd
Hebron
Town Open Space (Grayville Road)
Judd Brook Ln
Niles Rd
Grayville Falls Town Park
Seneca Brook Dr
Salmon River
State Forest
Bernstein
Open Space
Old Daniels
Camp Conn. I.O.O.F.
Legend
0 0.075 0.15 0.3 Miles
Airline Trail
Roads
Inland Wetland Soils
Critical Habitats
Hydrography
Open Space
Parcels
Focus Areas
Skunkamaug Sportsmen's Club (2 Parcels)
Colchester
Colchester


Hebron Open Space and Hydrology
N
W
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Hibbard Property
Salmon River State Forest
Salmon River State Forest
Bernstein Property
Legend
0
0.125
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0.5 Miles
Roads
Elevation Contour
Airline Trail
Hydrography
Inland Wetland Soils
Open Space
Hebron Parcels

Forestry

Nathan Piché
Forester 1, State Lands Management Program CTDEEP

Overview

The Hebron section of the Airline State Park Trail contains both the Salmon River State Forest and the Raymond Brook Wildlife Management Area, both of which contain diverse forest, riparian and wetland habitats while creating important public land access opportunities for the community. The acquisition of the Hibbert and Bernstein properties complement these adjacent state properties well, creating a conserved corridor of land along the trail.

The greatest threat to forestland in Connecticut is development, which fragments and degrades habitat while adding complexity to landscape level management and conservation efforts. Protecting these properties from future development through town ownership is a major success for these forestlands and for the wildlife that live within them.

Important Elements of the Forest

The Hibbert and Bernstein properties contain forested wetlands/red maple lowlands which filter and store water, riparian hemlock stands that filter water and shade rivers to keep the water cool for many aquatic species, and stands

of oak, hickory and other deciduous tree species on uplands sites that provide a mast crop that is vital for a plethora of wildlife species. In the anthropogenic sense of time these tree communities within the forest often appear stagnant; however, they are ever changing due to growth, insects, diseases, and weather events. These changes in the forest over time, along with interesting land use histories such as charcoaling and milling, present excellent educational opportunities.

Photo 1.0. Sponge moth defoliation, leading to oak mortality, has long term impacts on the forest. The forest is ever changing, growing, adapting, and evolving to stressors.

Forest Health Concerns

- Invasives – Primarily Japanese barberry. Honeysuckle, multi-flora rose, bittersweet, and burning bush are also present on both the Hibbert and Bernstein properties.
- Emerald ash borer

Photo 1.1. Photo of the bark from an ash tree. D shaped exit holes from emerald ash borer, visible on this tree, are present. Ash trees are also "blonding" due to woodpecker activity and crowns are thinning and dying back.

- Beech leaf disease

Photo 1.2. Photo of beech leaves infected with beech leaf disease. The dark banding of the leaves are the first signs of this disease. This is caused by a nematode.

- Beech bark disease
- Historical spongy moth defoliation and subsequent oak mortality – notable outbreaks in the late 1970's, early 1980's as well as 2017 and 2018.

Conservation Opportunities

The diversity of forest and habitat types/elements of the forest are important to protect, conserve, and enhance through a combination of both passive and active management. Of particular interest is the continuation of oak species in the landscape. Due to deer's preference to browse oak species over others as well as the absence of frequent low-intensity fires, many oak species are being outcompeted by black birch, red maple, and American beech. Well planned and well executed forest management activities can enhance habitat elements of the forest while providing conducive conditions for the continuation of oak on the landscape in the future. Hunting is also an important recreational and management use to consider as it aids in balancing the available habitat with the number of deer within it, resulting in a healthier forest vegetation condition.

These properties also contain areas that are dominated by invasive plant species such as Japanese barberry, burning bush, multi-flora rose, bittersweet, and honeysuckle. These areas provide dense cover, an important habitat element; however, through strategic management of invasive plants these areas could be enhanced to maximize their wildlife habitat value.

Photo 1.3. Photo of Japanese barberry in the forest understory. Invasive plants such as this often out complete and displace native vegetation.

PASSIVE & ACTIVE MANAGEMENT

There is a place and time for both active and passive forest management. Both approaches have value and are important to the health of the forest and its habitats, on both a small parcel scale as well as a landscape scale. In the southwest corner of the Bernstein property there is a stand of pole sized hardwoods (6”-10” diameters) that grew in after many of the dominant trees died due to spongy moth defoliation in the 1970’s and 1980’s. A stand of trees such as this could be thinned to improve the future growth, quality, and mast production of selected trees. The property also has ridge tops growing a high density of white oak advance regeneration that could be released to additional sunlight to graduate these seedlings and saplings into the upper canopy of the forest to serve as the future forest for the next generation.

Meanwhile, there are other sites within the property such as forested wetlands, riparian areas, and areas with historical and/or cultural significance where passive management is more appropriate. Long term passive management (150-200 years +) results in a late succession, old forest condition, with trees of various age classes that creates structural complexity within the forest. Many of the forest stands on these properties are currently even aged and range in age from approximately 50 to 100 years old. Therefore, if uneven aged, old forests are a goal to have, uneven aged silvicultural practices could be employed to create more structural diversity within the forest that mimics natural stands of late succession, old forests. Employing both passive and active management, where appropriate, creates a mosaic of habitat elements on the forest landscape, meeting the needs for the widest range of wildlife species.

Photo 1.4. Pole sized (6”-10” diameters) stand of hardwoods dominated by oak species that grew in after many of the dominant trees succumbed to spongy moth defoliation in the 1970’s and 1980’s.

Photo 1.5. Ridge top stand of oak with a high density of white oak advance regeneration.

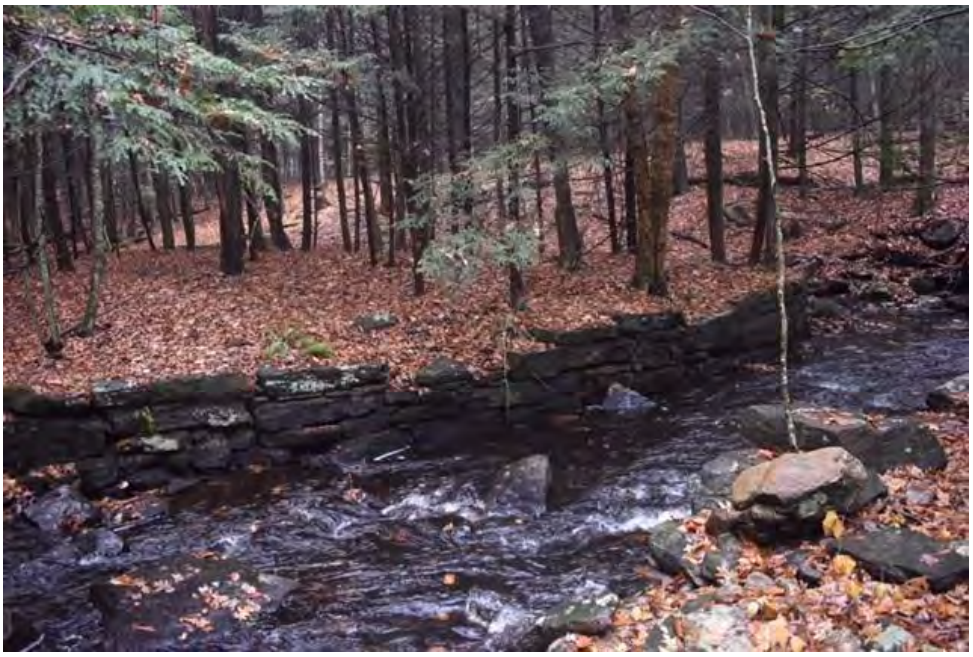
Photo 1.6. Photo of a managed site within Salmon River State Forest where the goal was to create a more structurally diverse, late succession, old forest condition. A selection harvest was completed in 1985 that opened canopy gaps, allowing sugar maple to regenerate (now pole sized trees in this photo), while retaining old legacy trees to serve as habitat and to increase the structural complexity of the forest canopy.

BEST MANAGEMENT PRACTICES

When conducting active management, it must be acknowledged that there is risk involved. There are liability risks, risks of spreading invasive species, erosion risks, and risks to threatened, endangered and/or of special concern wildlife species. Careful planning and forethought can minimize these risks so that management can take place that is designed to improve the overall condition, health and/or quality of the forest and the habitat it provides. Below is a list of best management practices when conducting active forest management.

- Always seek professional advice from experienced, licensed individuals. CT DEEP service foresters are a great place to start. Private consulting foresters also provide technical advice and services.
- Have an agreement in writing. A work order, service agreement or contract sets the terms and helps manage expectations. An important element of these agreements is insurance, which protects both the landowner and the service provider.
- Follow Natural Diversity Database Review recommendations to avoid negative impacts to threatened, endangered and/or of special concern species. This may include specific working timeframes, areas to avoid, and habitat elements to preserve.
- Thoroughly prepare the site. This includes marking property boundary lines, marking trees to cut, marking trees to leave, marking trails, designing water crossings (if necessary), and designating access points. A well-prepared site will increase operator efficiency, avoid negative impacts to the land and residual trees, avoid potential conflicts as well as manage expectations on how the project will be carried out.
- Follow best management practices for water quality while harvesting forest products. This may include water bars, temporary bridges, and sediment control structures such as hay bales or silt fences. This applies to recreational trail construction/maintenance as well.
- If present, manage invasive species prior to and/or after any tree cutting by mechanical or chemical means.

Monitor results. Forests change over time through natural growth, succession, and disturbances. A forest can be tended to in the same way a gardener tends to their garden. Areas where active management was employed should be monitored and follow up work can be completed to achieve the desired forest and/or habitat goals. Monitoring results can also be fun as it



Wildlife

Brian Hess, Supervising Wildlife Biologist, CT DEEP Wildlife Division
Ann Kilpatrick, District Wildlife Biologist, CT DEEP Wildlife Division

The Bernstein and Hibbert properties feature upland, wetland, and stream-adjacent habitats. These habitats are situated within a larger landscape of relatively undeveloped properties with important wildlife populations throughout the watershed including Salmon River State Forest and Raymond Brook Marsh Wildlife Management Area. Additional surveys are necessary to determine species presence on the Bernstein and Hibbert properties; however, regardless of species presence, these properties are part of a larger system of interconnected habitats that support a wide variety of organisms on neighboring properties including several state-listed species (endangered, threatened, special concern, State of Connecticut Endangered Species Act) and Species of Greatest Conservation Need (GCN) as identified in the 2015 Connecticut State Wildlife Action Plan (CT Dept. of Energy and Environmental Protection 2015). The neighboring Blackledge Block of Salmon River State Forest has known occurrences of eight species identified as state endangered or of special concern, including one bird, four reptiles, two freshwater mussels and one freshwater fish.

Freshwater Mussels

Two state-listed freshwater mussels have been documented in watersheds connected to the Judd Brook and Raymond Brook systems, both of which flow adjacent to the Bernstein and Hibbert properties. Brook floater (*Alasmidonta varicosa*) is a State Endangered species and the Eastern pearlshell (*Margaritifera margaritifera*) is a State Special Concern species. Freshwater mussels are filter-feeding animals dependent on healthy host-fish populations for reproduction and dispersal. These two species, in particular, require clean water and are sensitive to disturbances that cause sedimentation and turbidity in their streams. Judd Brook and Raymond Brook, to date, have not been surveyed for freshwater mussels; should future surveys indicate that either species is present, protection of the streambed/banks, riparian corridor vegetation, and adjacent upland areas from ground disturbance and development, would be important to maintain the water quality needed for the long-term survival of these sensitive

species. Even if no mussels are present in these smaller, faster-flowing streams, activities that degrade water quality downstream would negatively impact these species, as well.

Bats

Nine species of bats are found in Connecticut. All species but one, the big brown bat (*Eptesicus fuscus),* are state-listed. During their active season from April through October, bats make use of a mosaic of habitats across the state for foraging and reproduction. Important features of the Bernstein and Hibbert properties that may be important for bats include large mature trees and snags with the potential for cavities and forested wetland and stream corridors. Acoustic surveys could indicate the composition of species present and relative level of bat activity on these parcels.

Birds

Formal surveys for the presence of bird species have not been conducted on either the Bernstein or Hibbert properties; however, the properties are within the Connecticut Bird Atlas survey block 70A (www.ctbirdatlas.org). Preliminary results indicate that the following GCN species are either confirmed, probable, or possible breeders within the block:

Species	Breeding Status
Baltimore Oriole (*Icterus galbula*)	Confirmed
Blue-winged Warbler (*Vermivora cyanoptera*)	Confirmed
Eastern Kingbird (*Tyrannus tyrannus*)	Confirmed
Worm-eating Warbler (*Helmitheros vermivorum*)	Confirmed
Black-billed Cuckoo (*Coccyzus erythropthalmus*)	Possible
Chimney Swift (*Chaetura pelagica*)	Possible
Eastern Towhee (Pipilo erythrophthalmus)	Possible
Eastern Wood Pewee (*Contopus virens*)	Possible
Indigo Bunting (*Passerina cyanea*)	Possible
Little Blue Heron (*Egretta caerulea*)	Possible
Louisiana Waterthrush (*Parkesia motacilla*)	Possible
Northern Flicker (*Colaptes auratus*)	Possible
Ovenbird (*Seiurus aurocapilla*)	Possible
Rose-breasted Grosbeak (*Pheucticus ludovicianus*)	Possible
Wood Thrush (*Hylocichla mustelina*)	Possible
Yellow-billed Cuckoo (*Coccyzus americanus*)	Possible
Black and White Warbler (*Mniotilta varia*)	Probable
Veery (*Catharus fuscescens*)	Probable

Additionally, eBird submissions (https://ebird.home/org) suggest that the following GCN species also may be present: Northern parula (*Setophaga americana*), scarlet tanager (*Piranga olivacea*), field sparrow (*Spizella pusilla*), and broad-winged hawk (*Buteo platypterus*). Further survey work should be undertaken to determine species composition.

Woodcock, New England Cottontail and Other Early Successional Habitat - Dependent Species

The Bernstein and Hibbert properties are located in close proximity to one of three focus areas designated in the Management Plan for American Woodcock in Connecticut (CT DEEP 2012, unpublished report; Figure 1). These focus areas contain mixed ownership, with either a wildlife management area or state forest as their core. Woodcock, a GCN species in Connecticut, are dependent upon young forest, open habitats, and moist soils. As long as the habitat provides the necessary early successional structure (Straw et al. 1994), woodcock are not restricted to specific plant assemblages (Keppie and Whiting 1994). Woodcock require a variety of different habitats throughout their life cycle (Figure 2). Woodcock utilize young forest habitats in Connecticut for breeding and as stopover areas for feeding and cover during migration. Woodcock prefer dense, shrub-dominated forests with moist soils (Keppie and Whiting 1994). Moist soils ensure that earthworms are near the soil surface and are available to foraging birds (Dessecker and McAuley 2001). Unfortunately, this type of habitat has been disappearing in Connecticut over the last 40 years, primarily due to development and forest maturation. As suitable habitat patches become increasingly smaller, wildlife species attempting to utilize those patches become increasingly vulnerable to predation (Brown and Litvaitis 1995). Woodcock may feed in stands of mature forest if there is a dense understory.

The Bernstein and Hibbert properties also are located in close proximity to the Lebanon Focus Area for New England cottontails (NECs; Figure 1), one of 12 focus areas identified in Connecticut as having good potential for both habitat and population restoration for NECs. The NEC is Connecticut's only native cottontail and has declined by approximately 86% throughout its range in the Northeast (Litvaitis et al. 2006). The loss of habitat has been identified as the primary cause of this decline. New England cottontails require large patches (ideally 25 acres or more) of young forest or dense shrubland to maintain viable local populations (Fuller and Tur 2012).

While the American woodcock and NEC are focal species for young forest habitat creation, over 50 GCN wildlife species rely on young forest or shrubland. On that list are many songbirds such as eastern towhee, indigo bunting, prairie, chestnut-sided and blue-winged warbler; reptiles such as box turtle, wood turtle and smooth green snake; a number of small mammals; and many insects including pollinators (CT Dept. of Energy and Environmental Protection 2015). While the Bernstein and Hibbert properties are mostly mature forest, forestry actions to address stand diversity, disease, and encourage oak regeneration can contribute to the mosaic of young forest on the landscape. Maintenance of the reverting agricultural fields on the Bernstein property utilizing best management practices also is recommended.

Baltimore Oriole, Blue Winged Warbler, Indigo Bunting

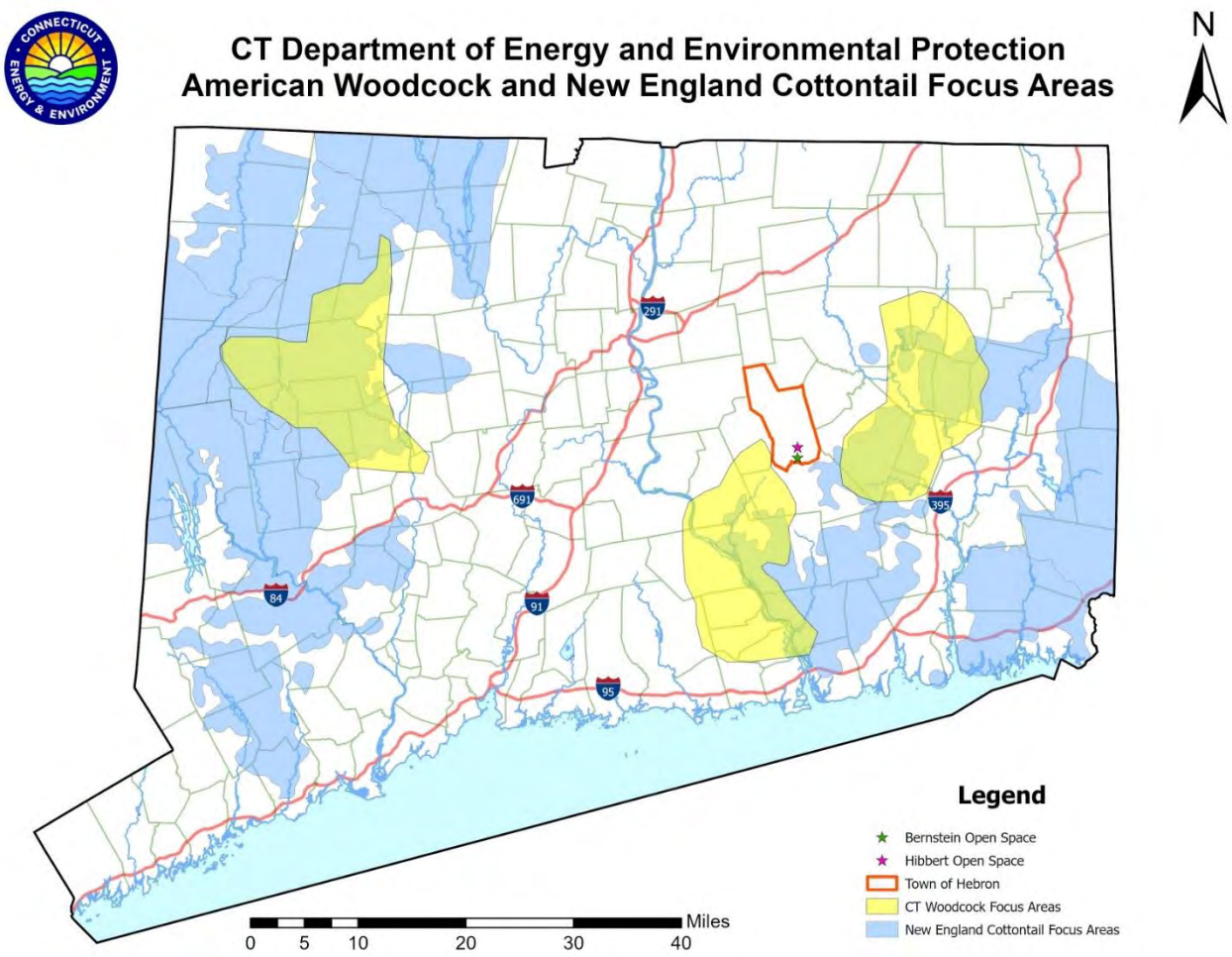


Figure 1. Location of the Town of Hebron's Bernstein and Hibbert Open Spaces in relation to American woodcock and New England cottontail focus areas in Connecticut.

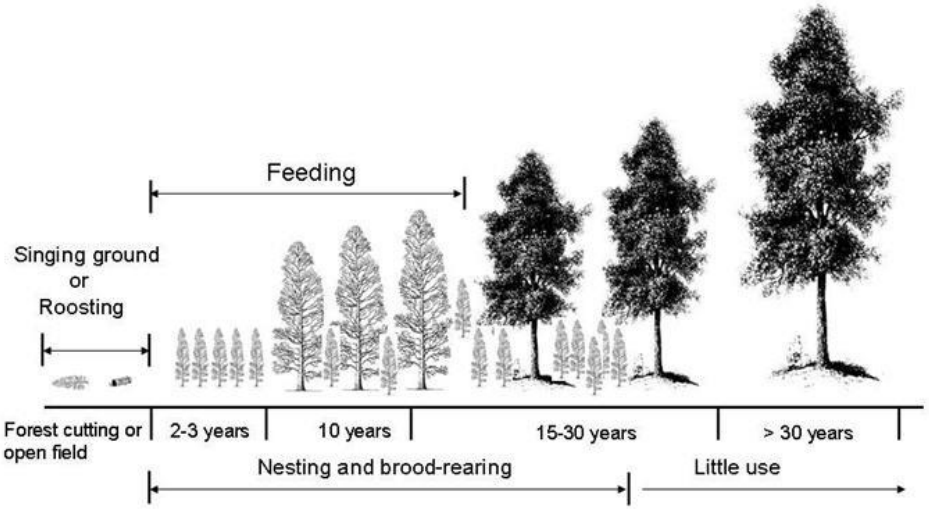


Figure 2. Key habitat components required by woodcock in relation to forest succession (Palmer 2008).

American Woodcock and Eastern Cottontail

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Fisheries

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Fisheries Biologist Natural Resources Division, CTDEEP

Near the Bernstein Property, Judd Brook flows along the southern boundary of the property. The stream supports a fish community that includes common resident species such as Blacknose Dace, Longnose Dace, Common Shiner, Fallfish, Tessellated Darter, and White Sucker as well as the catadromous American Eel. Prior to 2011, Judd Brook had been stocked with Atlantic Salmon fry as part of the Fisheries Division's Atlantic Salmon restoration efforts in the Salmon River watershed. There is currently no special management or active stocking program at Judd Brook. An unnamed tributary of Judd Brook flows along the eastern portion of the property. The Fisheries Division has not conducted any sampling at this location; however it likely supports a similar fish community to Judd Brook.

Blacknose Dave: This fish tends to inhabit headwaters, creeks, and small rivers with swiftly moving water. However, fry mature in slower moving portions of the habitats like shoals and pool margins. The species as a whole prefers cool, rocky areas and uses the stones to rest under and around. They also use overhanging vegetation and undercut banks for additional refuge. In the winter, they migrate from headwater streams into rivers and can be found in deeper water under banks. It is dark brown to olive on its dorsal surface and silvery white below, the two shades separated by the darkly pigmented lateral line. In the breeding season, males develop darker pigmentation and an orange lateral line. Blacknose dace live in rocky streams and rivers where they feed upon small invertebrates and microscopic biological matter and provide forage for larger fish.

Longnose Dace: This fish can be mistaken for suckers because of their subterminal "sucker-like" mouth. However, longnose dace (like all members of the family cyprinidae) lack small fleshy projections, called papillae, on their mouths. Juveniles have a black lateral line that extends from the beginning of the eye to the caudal fin that fades as the fish matures. The lateral line in juveniles is not present in all populations. In adults, the dorsal side is dark green to black, the lateral side is darkish to silvery with mottling often present, and the ventral side is pearly.

Common Shiner: The common shiner is silvery colored (sometimes bronze) and has an "olive back with a dark dorsal stripe. The common shiner is a freshwater fish found in North America. Adults inhabit rocky pools in small to medium rivers. They can live to be approximately 6 years old. They are considered sexually mature by 7.4 cm. Breeding males have a pinkish tint over most of their body and small bumps or tubercles on their head

Fallfish: This fish generally measures about 5 in (13 cm) in length, but individuals occasionally grow to 15 in (38 cm)[2] with exceptional specimens of more than 19 in (48 cm) having been recorded.[3] Juvenile fallfish have a dark stripe that runs down the center of their body. They are a silvery shade on the top and sides of the body, but have a white shading on the belly. Breeding males develop a pinkish tone on the opercular region, although the species does not develop bright breeding colors. Spawning males build stone nests, known as a redd, which form a prominent part of the bottom on many streams throughout the northeast. Spawning is communal with both males and females joining the nest builder. Fallfish are often encountered when fishing for more desirable species, but their large size, dogged fighting style, powerful runs on light tackle, and willingness to strike make them a worthy quarry in their own right. They will readily take bait, lures, and flies, and have been known to strike lures almost as large as themselves.

Tessellated Darter: freshwater ray-finned fish, a darter from the subfamily Etheostomatinae, part of the family Percidae, which also contains the perches, ruffes and pikeperches. Tessellated darters eat crustaceans and small insects when they are small, gradually shifting to larger insects as the fish get bigger. Male tessellated darters guard nests of fertilized eggs until the fry (young) are free-swimming and have been observed to engage in alloparental (adoptive) care of previous nest inhabitants' eggs. Alloparental care is associated with increased male reproductive success in this species. Males frequently engage in filial cannibalism (consumption of their own offspring)

White Sucker: a long, round-bodied fish with a dark green, grey, copper, brown, or black back and sides and a light underbelly. The fish also has typical features of primitive Cypriniformes fishes, such as a homocercal tail, cycloid scales, and dorsal, pectoral, and pelvic fin rays. When full grown, it can reach lengths of 12–20 in (30–51 cm) and weigh 2–6 lb (0.91–2.72 kg). The fish's suckermouth, with its fleshy lips, is located in an inferior position at the bottom of its head, as the fish obtains its food from bottom surfaces. The white sucker is often mistaken for different species of suckers and redhorses, but can be distinguished by the complete lateral line system containing 55-85 small scales. The white sucker is able to use chemosensory to sense and avoid predators and other conspecific species during day and night. The white sucker is highly adaptable to different habitats and changing environmental influences.

Herpetology

Hank Gruner, Conservation Biologist/Herpetologist, Consulting
Dennis Quinn, Herpetologist, Quinn Ecological, LLC

Amphibian and Reptile Management Considerations
Bernstein and Hibbert Open Space Properties, Hebron, CT

The Bernstein and Hibbert properties include a mix of upland and wetland habitats including frontage on Judd Brook (Bernstein) and Raymond Brook (Hibbert). The two parcels are ecologically connected to a broader network of relatively large and intact properties, including the Salmon River State Forest and the Raymond Brook Marsh Preserve. This network supports a diverse community of amphibians and reptiles, including several state-listed species (endangered, threatened, special concern, State of Connecticut Endangered Species Act), as well as non-state listed species recognized as species of Greatest Conservation Need in the State's 2015 Comprehensive Wildlife Action Plan.

This report discusses management considerations for those species and their critical habitats that should be included within land use planning activities (e.g., recreation, forestry, habitat management, etc.). A comprehensive review of amphibian and reptile conservation in Connecticut for those interested in greater detail can be found in Klemens et al 2021. Additional guidance regarding habitat management for amphibians and reptiles can be found in Mitchell et al 2006).

Ed Pawlak, a wetland scientist, conducted wetland surveys on the properties including an investigation of vernal - breeding amphibian species (e.g., wood frog, spotted salamander). We refer to his report on species occurrence and habitats. Where vernal pool species have been documented, it is recommended that forestry habitat management guidelines be implemented for activities surrounding vernal pools identified on the properties (refer to:(Calhoun and deMaynadier, 2004) Microsoft Word - Final_BDP.doc (army.mil).

These forestry habitat management guidelines are also applicable to the ribbon snake (*Thamnophis sauritus*, state-listed special concern) and spotted turtle (*Clemmys guttata*, state-listed special concern) which utilize a mosaic of wetlands, including vernal pools, and upland habitats. Populations of spotted turtles and ribbon snakes have been documented within the area.

Eastern Box Turtle and Spotted Turtle Source CT.Gov

A. Eastern Hog-nosed B. Ribbon Snake C. Black Racer Snake D. Smooth Green Snake

The eastern box turtle (state-listed special concern) has also been documented from the area. The reverting fields located in the northeast section of the Hibbert property may provide important habitat for this species which utilizes a mosaic of forest and early successional habitats. Early successional habitats are limited in occurrence in the area and maintaining these fields in an early successional stage will support a diversity of wildlife, including the smooth green snake (*Opheodrys vernalis*, state-listed special concern), eastern hog-nosed snake, (*Heterodon platirhinos*, state-listed special concern), and black racer (*Coluber constrictor*, GCN species), among others.

In maintaining early successional habitats, it is important to follow best management practices to prevent unintended impacts on wildlife. This is especially important in the case of eastern box and other turtles where individual mortality can have a significant long-term negative impact on populations due to their reproductive life histories (i.e., long-lived, delayed sexual maturity, low fecundity). Mowing is often a source of mortality, thus, it is recommended that guideline for mowing in rare turtle habitat are implemented (refer to: Massachusetts Division of Fisheries and Wildlife 2009 mowing guidelines for rare turtle habitat).

The Jeremy River system, including its Judd Brook and Raymond Brook tributaries, provides habitat for the wood turtle (*Glyptemys insculpta*, state-listed special concern). Wood turtles utilize a mosaic of in-stream and surrounding upland habitats that extend linearly along broad stretches of riparian systems. Because of this, efforts that connect networks of rivers and streams, and protect surrounding habitats within zones extending from 300-1,000 feet from the edges of these watercourses, is critical for long-term conservation of this species. Management considerations within

these zones depend upon the suitability of the habitat present for supporting needs of the turtles, as well as the land use(s) planned for the site (refer to: Northeast Wood Turtle Working Group guidelines).

The stretch of Judd Brook bordering the southern portion of the Bernstein property (from the Airline Trail east to the Camp Connecticut parcel boundary) does not include primary in-stream or surrounding habitat important for wood turtles. This section of the brook is situated within a slight ravine and heavily shaded with hemlock, and lacks a well-developed floodplain. Instream habitat is characterized by a rocky substrate and relatively rapid flow.

Although this stretch of Judd Brook may not hold wood turtles, it is ecologically connected to habitat in the Jeremy River just to the west, and suitable habitat just to the east where the brook abuts the Camp Connecticut parcel. Just east of the Bernstein/Camp Connecticut parcel the characteristics of Judd Brook change, with the presence of a riparian floodplain, and early successional habitat adjacent to the brook. Although this stretch of the brook was not visited, these changes are clearly evident on a 7.5 - minute topographic map of the area (Colchester Quadrangle).

In contrast, Raymond Brook, which flows through the Hibbert property contains suitable wood turtle habitat, especially along the southeast section of the brook. This stretch includes open and forested riparian habitat south of the brook, and two sections where the brook has been historically “pooled”. These sections feature relatively slow, deep water with an open canopy and shrub/herbaceous vegetation along the banks.

Several areas of early successional habitat are located within 300 feet of the brook on its north side. These include two small openings where structures appear to have been removed. The presence of an open canopy and areas of exposed, dry soil render these sites suitable as nesting habitat. During a survey of the site conducted on June11th (middle of turtle nesting season), a single “test hole” excavated by a female turtle seeking to deposit eggs was observed, although it is not possible to determine what species of turtle was involved. South of these two openings and closer to the brook there is a larger opening that features a partially canopied upper slope dominated by herbaceous growth, and a lower open canopied wetter area, also dominated by herbaceous growth. These areas provide ideal “near stream” basking and foraging habitat for wood turtles.

Management considerations for the wood turtle are challenging where the goal is to provide recreational access and use of a property. Wood turtles are highly vulnerable to loss of individuals due to incidental collection, especially female turtles seeking nest sites. Careful consideration of the location of trails and parking areas adjacent to the watercourse is important to prevent unintended impacts on the resident population. A network of trails exists on the property, including an unimproved access road that skirts a section of the river with suitable turtle habitat, and several loops that lead to and/ or traverse the adjacent early successional habitats.

If the primary goal is ecological and the conservation of biodiversity the following recommendations should be considered:

- Focus public access on the southern Airline Trail (south) and Northam Road (north) points, and the western and interior trails.

- Minimize access to the northeast section of the property and the trails that traverse the early successional habitats.

- Maintain the existing openings in the northeast in early successional stages utilizing best management practices with management activities occurring during the period October- February.

If the primary goal is to provide passive recreational use and access the following recommendations should be considered. The collection of additional data (e.g., wood turtle movement and habitat use), beyond the scope of this ERT, and engaging a biologist with experience in wood turtle ecology to participate in the design and planning of planned improvements should also be considered.

- Eliminate the short section of trail branching south from the main access road that passes through the southern opening before dead-ending just above the brook.

- Maintain the lower opening adjacent to the brook in an early successional stage utilizing best management practices with management activities occurring during the period October- February.

- Allow the two small upland openings located off of the trail to re-vegetate to shrub/herbaceous growth stages absent patches of bare soil to avoid attracting turtles to nest.

- If creation of a parking area at the Old Colchester Road entrance is planned, it should avoid establishing any permanent areas of open canopied bare soil, whether in the parking area proper, or along the edges, to avoid attracting nesting turtles. Any temporary areas of open bare soil created during construction should be fenced off with standard silt/erosion fencing, or alternatively, the placement of hay bales, until vegetated.

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Calhoun, A.J.K. and. P. deMaynadier. 2004. Forestry habitat management guidelines for vernal pool wildlife. MCA Technical Paper No. 6, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.

Klemens, M.W., H.J. Gruner, D.P. Quinn, and E.R. Davison. 2021. Conservation of Amphibians and reptiles in Connecticut. CT Dept. of Energy and Environmental Protection, Hartford, CT.

Massachusetts Division of Fisheries and Wildlife. 2009. Mowing advisory guidelines in rare turtle habitat: Pastures, successional fields ad hayfields. Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program.

Mitchell, J.C., A.R. Breisch, and K.A. Buhlmann. 2006. Habitat management guidelines for amphibians and reptiles of the northeastern United States. Partners in Amphibian and Reptile Conservation, Technical Publication HMG-3. Layout 1 (northeastparc.org)

Northeast Wood Turtle Working Group. A guide to habitat management for wood turtles (*Glyptemys insculpta*). Technical_Assistance_Booklet_62617 (northeastturtles.org)

CTDEEP Natural Diversity Database
Dawn McKay, Environmental Analyst 3, CTDEEP

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

June 24, 2020

Michael O'Leary
Town of Hebron
15 Gilead Street
Hebron, CT 06248
moleary@hebronct.com

Project: Land Acquisition and/or Protection of 215.5 Acre Parcel for Passive Open Space Including Development of Trails and Small Parking Lot for the Ella Bernstein Parcel (Assessor Map 18, Parcel 9, Map 27, Parcel 2) in Hebron, Connecticut

NDDB Preliminary Assessment No.: 202007204

Dear Michael O'Leary,

I have reviewed Natural Diversity Data Base maps and files regarding the Land Acquisition and/or Protection of 215.5 acre parcel for passive open space including development of trails and small parking lot for the Ella Bernstein Parcel (assessor map 18, parcel 9, map 27, parcel 2) in Hebron, Connecticut. According to our information there are known extant populations of State Listed Species that occur within or close to the boundaries of this property. I have attached a list of these species to this letter.

Please be advised that this is a preliminary review and not a final determination. A more detailed review will be necessary to move forward with any subsequent environmental permit applications submitted to DEEP for the proposed project. This letter is valid for one year.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov . Thank you for consulting the Natural Diversity Data Base.

Sincerely,

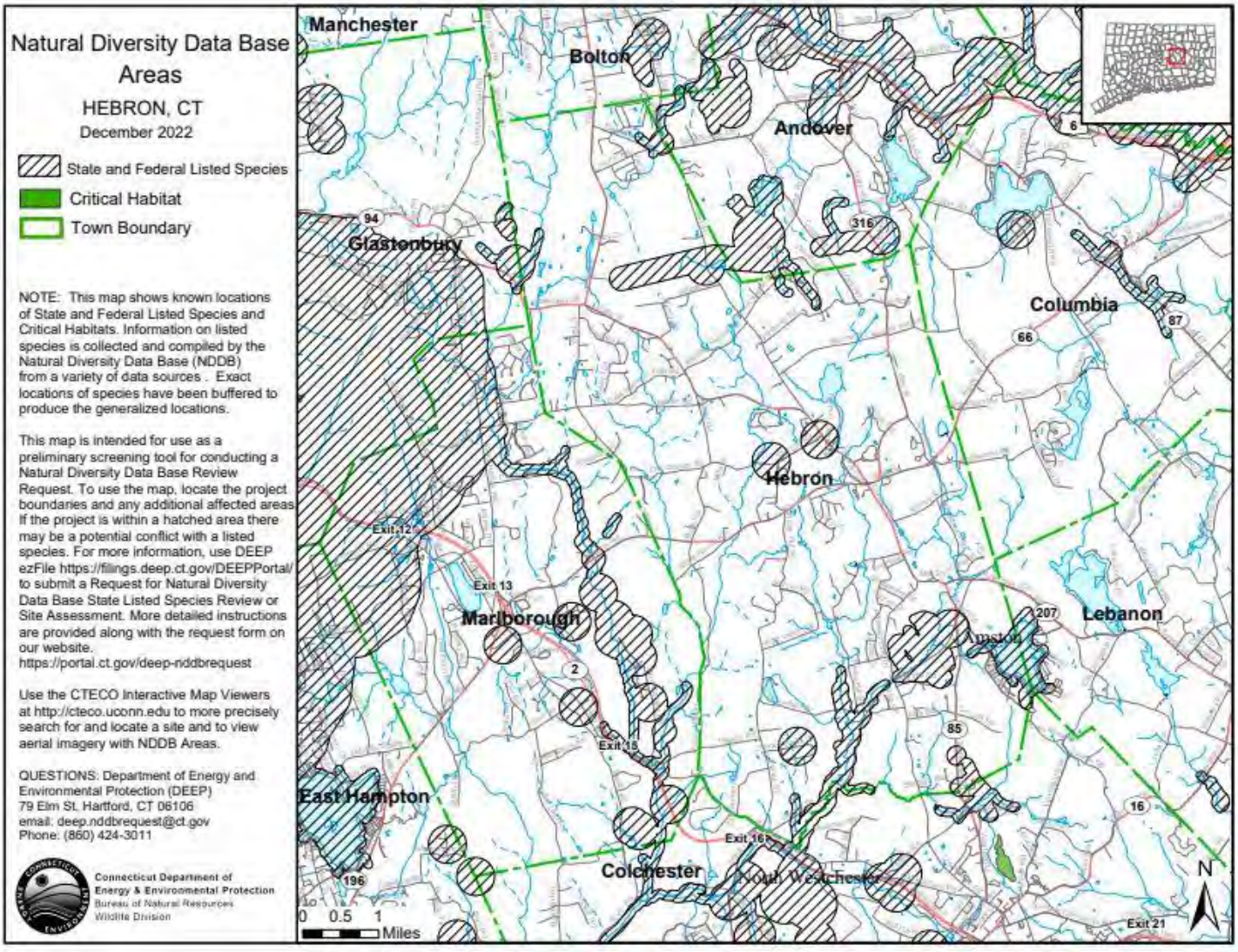
Dawn M. McKay

Dawn M. McKay
Environmental Analyst 3

79 Elm Street, Hartford, CT 06106-5127
www.ct.gov/deep
Affirmative Action/Equal Opportunity Employer

Species List for NDDB Request

Scientific Name	Common Name	State Status
Invertebrate Animal		
Alasmidonta varicosa	Brook floater	E
Margaritifera margaritifera	Eastern pearlshell	SC
Vertebrate Animal		
Clemmys guttata	Spotted turtle	SC
Glyptemys insculpta	Wood turtle	SC
Lasionycteris noctivagans	Silver-haired bat	SC
Lasiurus borealis	Red bat	SC
Perimyotis subflavus	Tri-colored bat	E
Terrapene carolina carolina	Eastern box turtle	SC



Invasive Plant Management and Pollinators

RECOMMENDED RESOURCES FOR PLANNING AND MANAGEMENT

Todd Mervosh is general manager of TM Agricultural & Ecological Services in Suffield, Conn. For the next 20 years, Todd was a scientist at The Connecticut Agricultural Experiment Station in Windsor. He conducted weed control experiments in several crops and did research on management of invasive plants including oriental bittersweet, Japanese stiltgrass and mile-a-minute weed. We are fortunate to have Todd to help with an overview of strategies about effective and ecologically sound plant management strategies, including proper use of herbicides. He provides vegetation control services on a wide range of lands across Connecticut.

Charlotte Pyle received her PhD in Forest Ecosystems Analysis at the Univ. of Washington. In Connecticut, she worked at the University of Connecticut as a Forest Ecologist and as a Landscape Ecologist with USDA Natural Resources Conservation Service. Now retired from NRCS, she is a Co-chair of the Connecticut Invasive Plant Working Group and chairs the group's Native Plant Alternatives Sub-Committee. As a nature writer, she was one of the 2016 Artists-in-Residence at Trail Wood (Audubon's Edwin Way Teale Sanctuary in Hampton, CT).

Invasives Management

- Invasive species can harm the values for which land is conserved.
- Natural lands are not fully protected unless they also are managed for the features that first motivated preservation.
- Invasive species can change community structure, composition, and ecosystem processes on these lands in ways that may not be anticipated or desirable.
- Careful management can minimize these negative impacts.

Section of Air Line State Park Trail near Bernstein Property shows invasive growth where clearing on left side of the photo and no invasive plants on right side of photo where natural species cover forest cover are intact.
https://conservationtools.org/guides/31-invasive-species-management-program

Pollinators

Hebron is unique in having an active group as noted on the Connecticut Pollinators Pathways Project. There is an opportunity to connect invasives management with planting sections of pollinator pathways on the properties and the Air Line State Park Trail with information signage for the public.

- Pollinator pathway concept -Insects need to eat as they travel -Backyards – corridor of pit stops Joining a pollinator pathway is easy. Creating on the Air Line State Park Trail will be more challenging
- Benefit for Hibbert and Bernstein properties and the Air Line State Park Trail: mitigate and promote management of invasives, agriculture resilience in the community, and scenic enhancement
- Opportunity for a fun regional public project for all ages – engages people into the management of invasives, planting pollinators and engaging in trail awareness
- https://www.pollinator-pathway.org/towns-1/Connecticut

POLLINATOR PATHWAYS-pollinator habitat connected or within safe and easy flight distance
- Air Line State Park Trail – many vegetation types, water sources, obvious path, good access

WHY ARE POLLINATOR PATHWAYS IMPORTANT?
- help educate about pollinators
- provide habitat for pollinators
- facilitate safe movement (long & short distance)

FINDING & CREATING POLLINATOR HABITAT
- don't overlook trees – important caterpillar host plants are Oaks, *Prunus* (Cherries, etc.), Willows, Birches, Poplars/Aspens
- look for existing patches of nectar sources
- look for easy access for watering in 1st year
- involve students and public groups to grow seedlings
- use signage to educate

Common Milkweed is an excellent nectar plant. Milkweeds also are the Monarch host plant. Each Spring it takes multiple generations of Monarchs to get back north to CT.

Good nectar source in unmown field with native Goldenrod & Joe-Pye Weed

Shrubs can be good habitat, offering not only nectar, pollen, and caterpillar food but also acting as a windbreak. < Summersweet is an excellent nectar source.

Additional Information
https://www.pollinator-pathway.org/
http://xerces.org/ (publications, etc.)

Planning Consistency

Jeanne Davies, AICP Environmental and Land Use Planner (CTRC&D)
Maureen Goulet, Principal Program Planner (Capitol Region Council of Governments)

STATE POCD

Consistency with Connecticut's Plan of Conservation and Development (CTPOCD) is not binding, but funding from state agencies is often predicated on the growth management principles laid out in the most recent version of the plan. Connecticut does not require municipal, regional, and state plans to be consistent with one another. That said, CGS Section 16a-31 requires state agencies to be consistent with the State C&D Plan whenever they undertake any of the following actions with state or federal funds:

(1) The acquisition of real property when the acquisition costs are in excess of two hundred thousand dollars.
(2) The development or improvement of real property when the development costs are in excess of two hundred thousand dollars.
(3) The acquisition of public transportation equipment or facilities when the acquisition costs are in excess of two hundred thousand dollars.
(4) The authorization of each state grant, any application for which is not pending on July 1, 1991, for an amount in excess of two hundred thousand dollars, for the acquisition or development or improvement of real property or for the acquisition of public transportation equipment or facilities.

Therefore, it is recommended that Hebron look to both the town, regional and state plans of conservation and development to ensure consistency in compatible land use and planning near the Hibbert and Bernstein properties, especially considering their proximity to the Air Line State Park Trail. Connecticut's POCD has several growth management principles listed that would apply to planning considerations for the properties quoted as follows:

"GROWTH MANAGEMENT PRINCIPLE #1 Redevelop and Revitalize Regional Centers and Areas with Existing or Currently Planned Physical Infrastructure: Encourage multi-disciplinary approaches to infrastructure planning and design. For example, for transportation projects in areas with combined sewers, seek to preserve the functional capacity of wastewater treatment plants by designing projects that enhance the infiltration of storm water generated by the existing street network and other impermeable surfaces through "green infrastructure" measures such as pervious pavement material and the incorporation of urban green spaces."

"GROWTH MANAGEMENT PRINCIPLE #4 Conserve and Restore the Natural Environment, Cultural and Historical Resources, and Traditional Rural Lands: It is widely recognized that Connecticut's natural, cultural, and historical resources, along with its rural landscapes, have intrinsic values which contribute to the state's high quality of life. Less obvious are the functional values that these resources provide, such as storm water management, flood control, oxygen production and carbon storage, and the filtration and purification of water for human consumption and habitat preservation. Similar to the need to maintain the physical infrastructure of cities and towns, there is a corresponding need to strategically invest in the state's natural infrastructure, through preservation and maintenance of multifunctional land."

4.1 Protect permanently preserved open space areas, Connecticut Heritage Areas, and archaeological areas of regional and statewide significance.

4.2 Limit improvements to permanently protected open space areas to those that are consistent with the long-term preservation of the natural resource and open space values of the site.

4.3 Expand the state's open space and greenway network through the acquisition and maintenance of important multifunctional land and other priorities identified in the State's Open Space Plan (i.e., Green Plan).

4.4 Avoid activities that could negatively affect rare or unique ecological communities and natural areas, including habitats of endangered, threatened and special concern species, other critical wildlife habitats identified in the Connecticut Wildlife Action Plan, river and stream corridors, aquifers, ridgelines, large or connected forest areas, highland areas, coastal marsh migration areas, and Long Island Sound.

4.5 Encourage collaborative ventures with municipalities, private non-profit land conservation organizations and other entities to provide a system of appropriately preserved and managed natural areas and Courtesy CT Office of Tourism.

4.11 Promote Connecticut's commercial and recreational fishing and aquaculture industries consistent with marine productive capacities and environmental protections.

4.12 Utilize the landscape to the extent practical and incorporate sound stormwater management design, such as low impact development techniques, in existing and new development to maintain or restore natural hydrologic processes and to help meet or exceed state and federal water quality standards, so that the state's waters can support their myriad functions and uses.

4.16 Protect the ecological, scenic, and recreational values of lakes, rivers and streams by promoting compatible land uses and management practices in accordance with adopted plans.

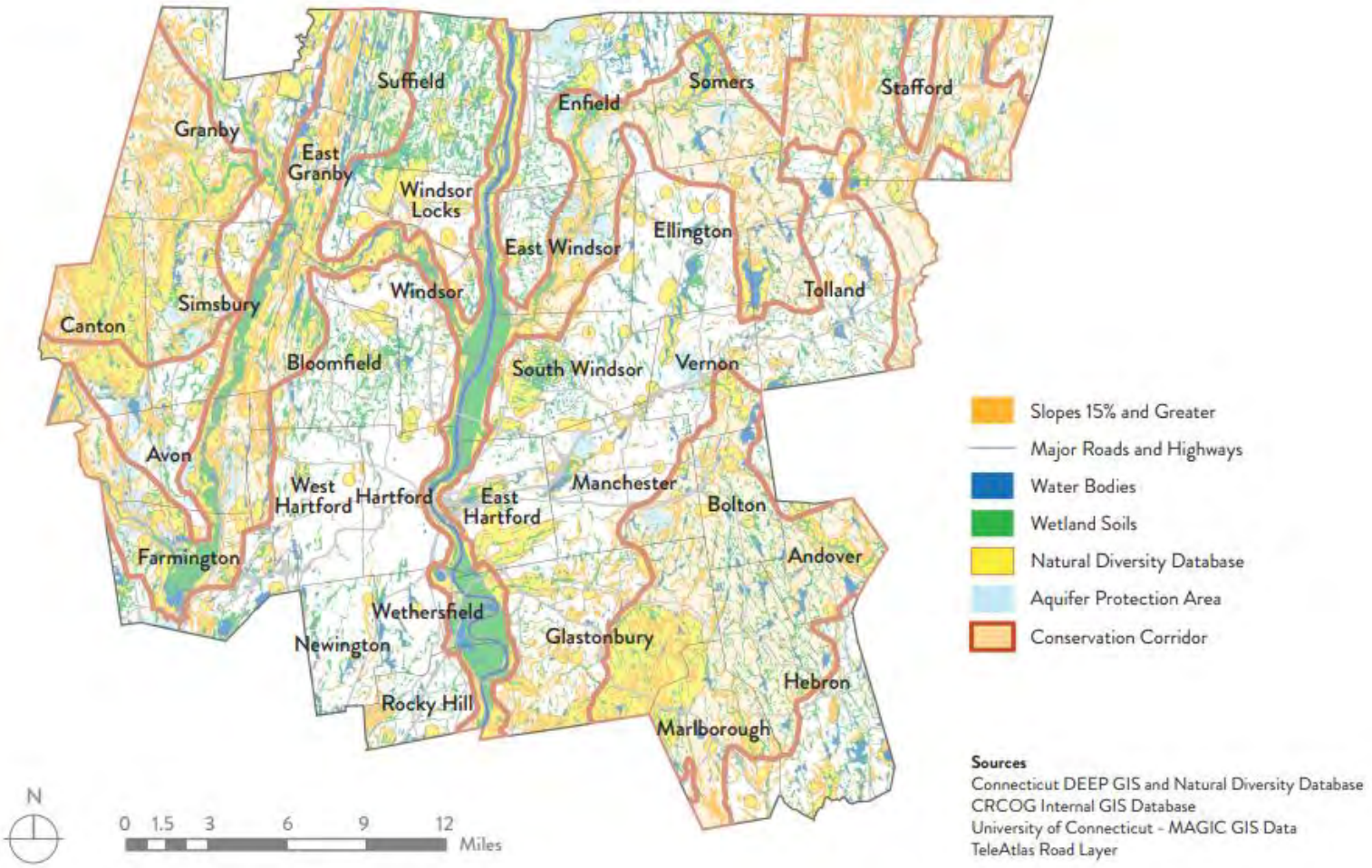
4.17 Protect, maintain, and restore the chemical, physical, and biological integrity of ground and surface waters to ensure that existing and designated uses are maintained.

4.18 Promote innovative land conservation and banking practices that further local, regional, and state conservation and development objectives, and minimize the need to expand infrastructure to support new development in rural areas.

CRCOG REGIONAL POCD

"Natural Diversity Areas: These areas, defined by the Connecticut Department of Energy and Environmental Protection, are the habitat of important species of animals or plants. Some of these species are endangered, threatened, or protected. In some cases, these areas are established to accommodate migratory patterns or some specific forest growing condition. In all cases, these are valuable resource zones that would be exceedingly difficult to replace if lost. Instead of mitigating development impacts in these zones, development should endeavor to prevent disturbance of the natural diversity in these areas or consider development away from them entirely. Beyond these important natural resource features that affect development decisions, other key resources must also be considered.

Map 3.1. Natural Resource Features and Constraints to Development



Healthy forestland, including forests used for commercial purposes, urban forest land, and larger, unfragmented forests in rural portions of the region, have tremendous importance to the ecosystem and our quality of life. Forests as a habitat for threatened species, as a flyway for migratory birds, and as a continuous wildlife corridor are resources that must be protected in our ever-fragmenting, ever developing world.

Grow and develop in harmony with Natural Resources. Glaciers, rivers, and historical land use have created a diverse natural environment in the Capitol Region. Because the ability of the land to support development varies across the region, plans must reflect the particular capacities and limitations of the proposed development area. This includes consideration of air, water, and soil resources, as well as existing wildlife populations and geologic features. Every effort should be made to mitigate or prevent harmful development impacts on natural resources. Policy

Recommendations

"Active Stewardship of Natural Resources Growth in the Capitol Region, as in many areas of the state or nation, is driven by residential and business development. Accordingly, natural resource protection often becomes passive, or a reaction to development. Local governments are often more likely to require that developers mitigate natural resource

impacts than they are to seek out opportunities to protect natural resource areas on their own. The importance of preserving vital natural resources should motivate the region's governing bodies to become more proactive in their approach to this issue.

Policy Recommendations

1. Encourage municipal and private groups to acquire or protect valuable natural resource areas as open space.

2. Support proactive and creative zoning that protects and preserves wildlife and water quality from development impacts such as LID regulations.

3. Encourage scientific management of forest lands and wildlife populations.

4. Promote local, state, and federal tax policies that would encourage protection of sensitive natural resource areas.

The LGM classifications are intended to help state agencies comply with the following administrative requirements associated with the Priority Funding Area (PFA) requirements of CGS Section 16a-35d."

Hebron POCD

"*Open space in the community provides tax revenues in excess of any municipal services that these properties demand and therefore are one of the best land uses in terms of a cost-benefit analysis. Other benefits derived from the preservation of open space and park areas include conservation of land as a visual resource, protection of water quality in streams, and preservation of wildlife habitats. While these broader benefits are important, they have been identified elsewhere in this Plan. This section will focus on meeting Hebron's need for active and passive recreation. The Town of Hebron is committed to maintaining its rural heritage and has had an active Open Space Land*"

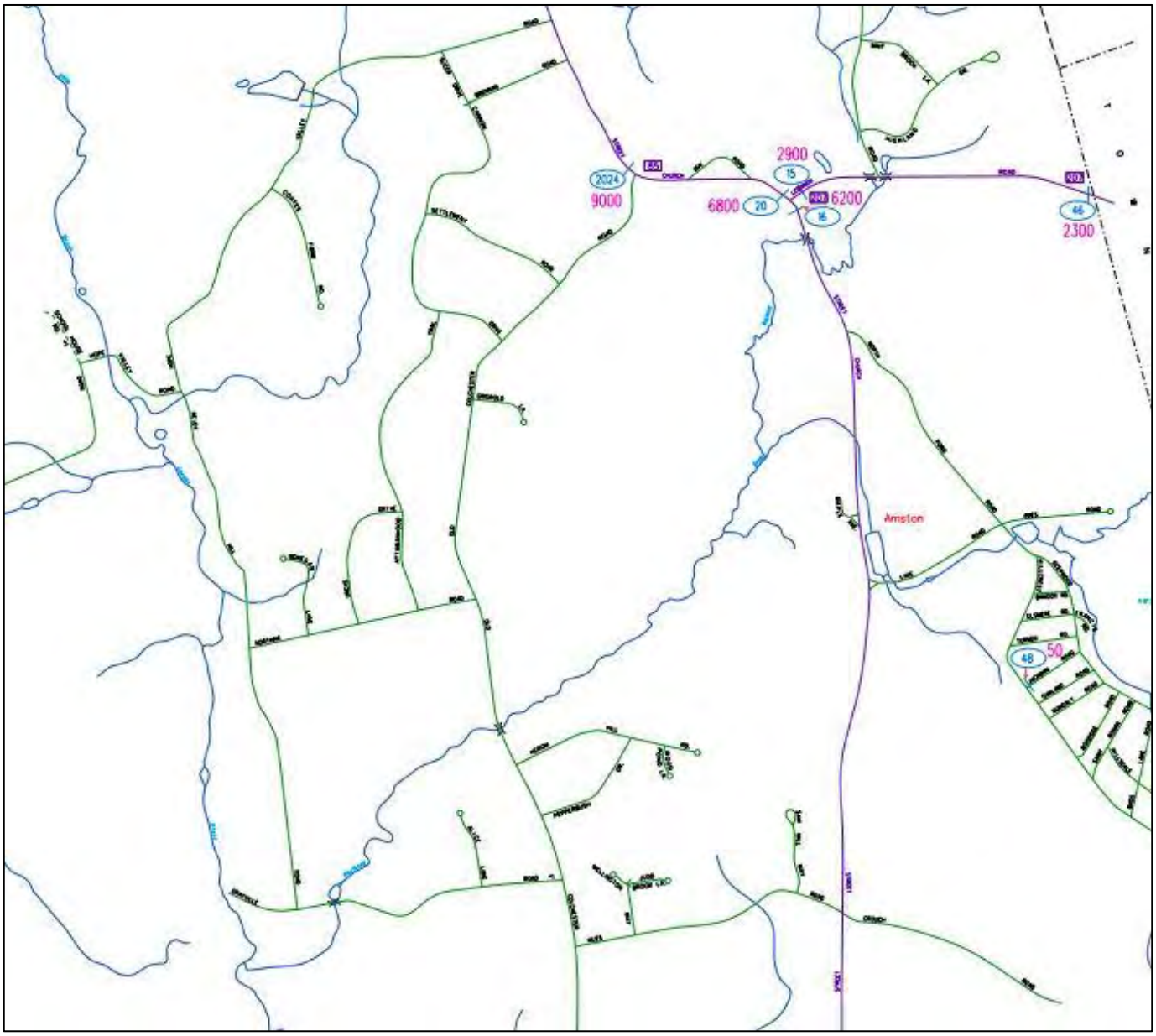
1.Publicize activities and facilities through the Parks and Recreation Department's seasonal publication, news organizations, and user groups. 2. Conduct a new community needs survey to obtain public opinion on future recreational needs, desires, improvements and programs. 3. Work with the Economic Development Commission and others in marketing the Town's many recreational opportunities to enhance local economic development, and bringing recreational activities such as bike races, running races and horseback trail riding meets to the Town business center. 4. Continue to pursue available grant funding to maintain, map, and extend current trail systems and enhance park facilities."

Transportation Considerations and Accessibility

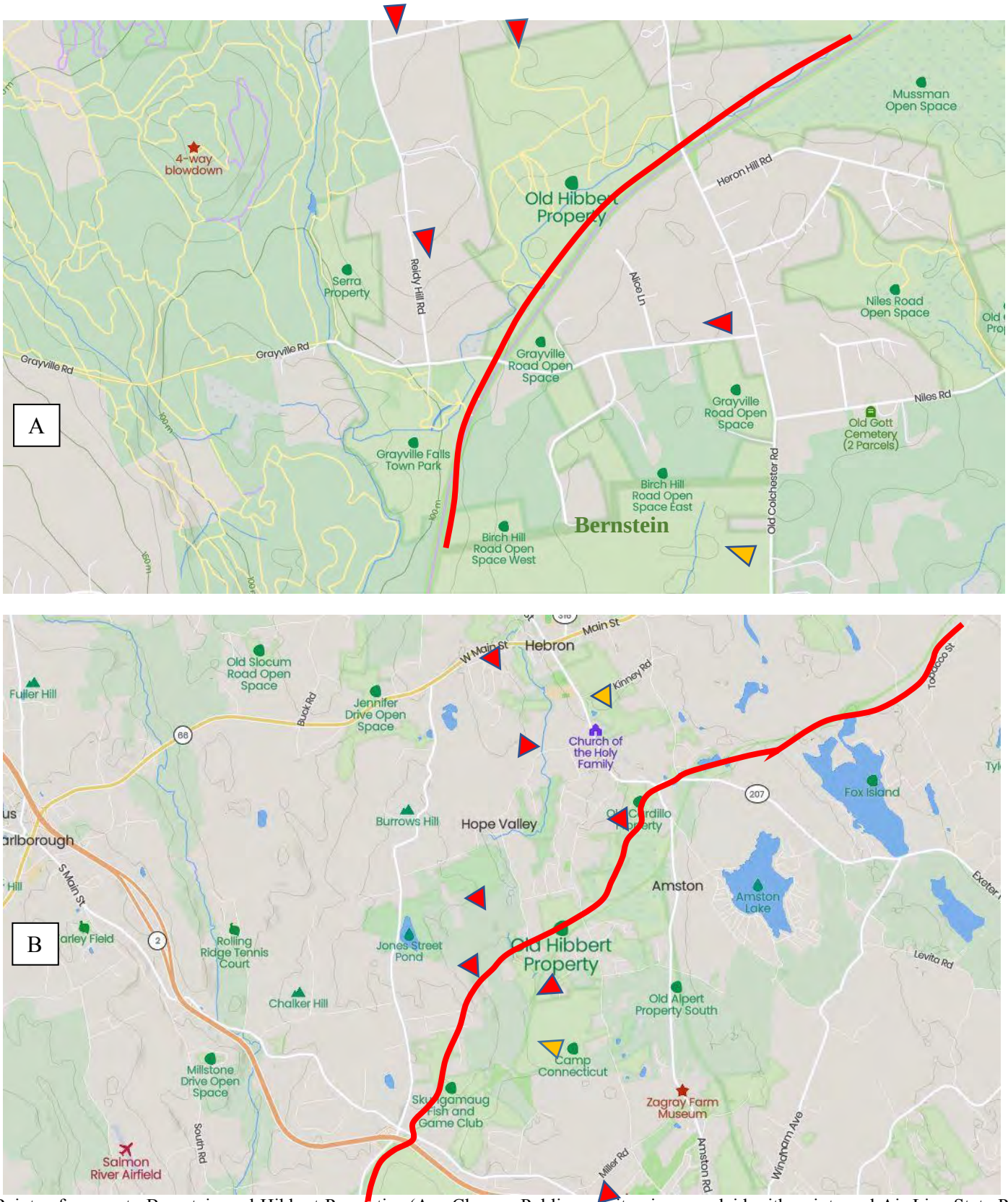
The Hibbert and Bernstein properties are relatively isolated with regard to transportation access and ease of accessibility. This advocates toward a more intensive passive recreation management strategy due to the limited number of users and also benefits efforts to use these properties for conservation management for wildlife and conservation education. There is also an opportunity for the town to capitalized on its trail connectivity project/plan toward management of access to the properties and the open space block surrounding the properties via the Air Line State Park Trail, promoting the town center services and potential future accommodations to visitors.

The Hibbert property is primarily accessed from Northam Road. The Bernstein property is accessed from the Air Line State Park Trail via Grayville Falls Town Park with a future access option from the Hebron Transfer Station.

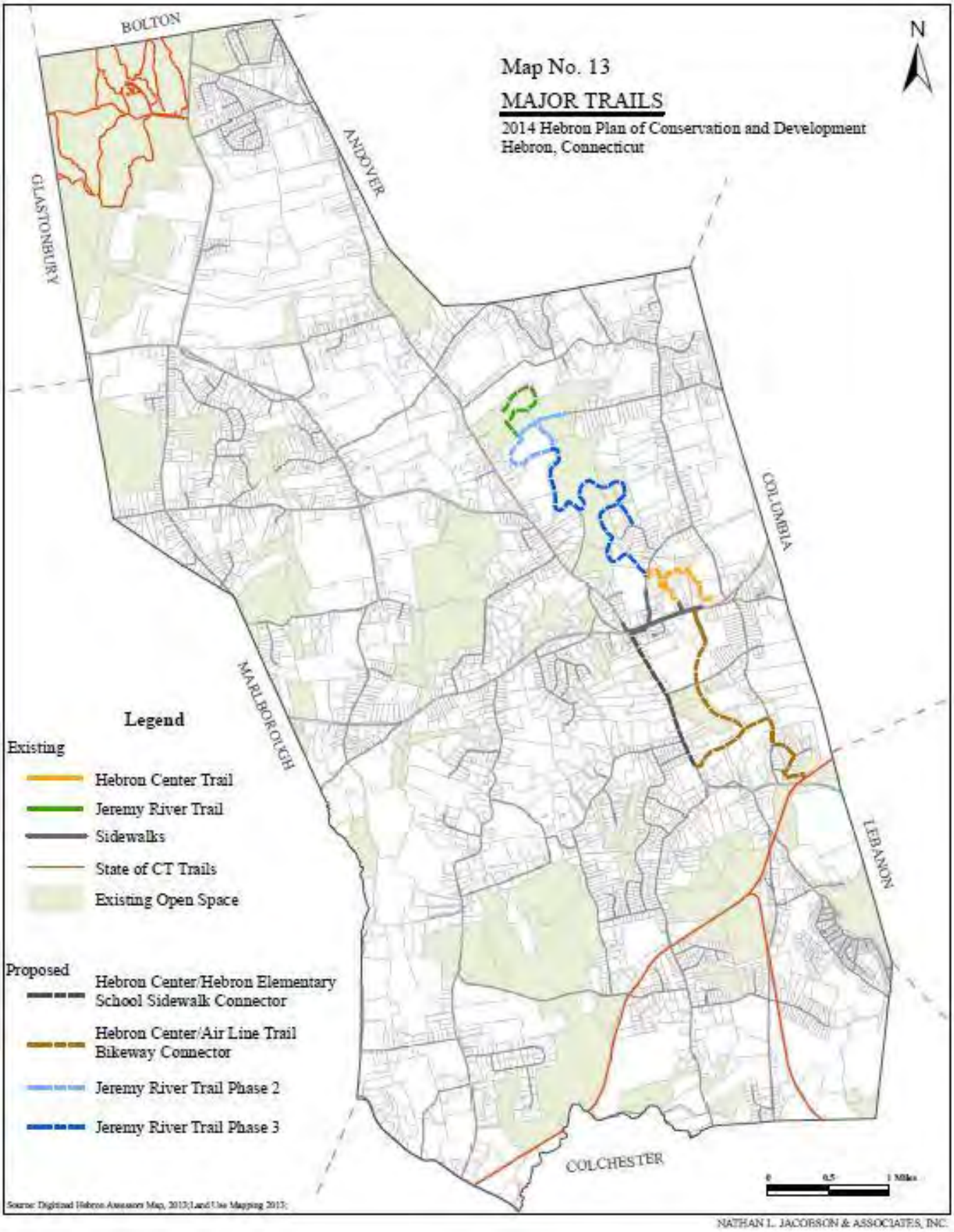
In a review of average daily traffic volume, Hebron primary routes indicate moderate use on major arterials as defined by the functional road classification system (CTDOT)



Average Daily Traffic Volumes estimates based on counting stations



Points of access to Bernstein and Hibbert Properties (A – Closeup Public website view overlaid with points and Air Line State Park Trail) (B – Wider public website view with overlaid points of access and Air Line State Park Trail). Orange arrows denote potential future access including plan to connect the town center to the Air Line State Park Trail.


Map No. 13
MAJOR TRAILS
2014 Hebron Plan of Conservation and Development
Hebron, Connecticut
N
BOLTON
ANDOVER
GLASTONBURY
COLUMBIA
MARLBOROUGH
LEBANON
COLCHESTER
Legend
Existing
Hebron Center Trail
Jeremy River Trail
Sidewalks
State of CT Trails
Existing Open Space
Proposed
Hebron Center/Hebron Elementary School Sidewalk Connector
Hebron Center/Air Line Trail Bikeway Connector
Jeremy River Trail Phase 2
Jeremy River Trail Phase 3
NATHAN L. JACOBSON & ASSOCIATES, INC.

Planning Observations and Recommendations

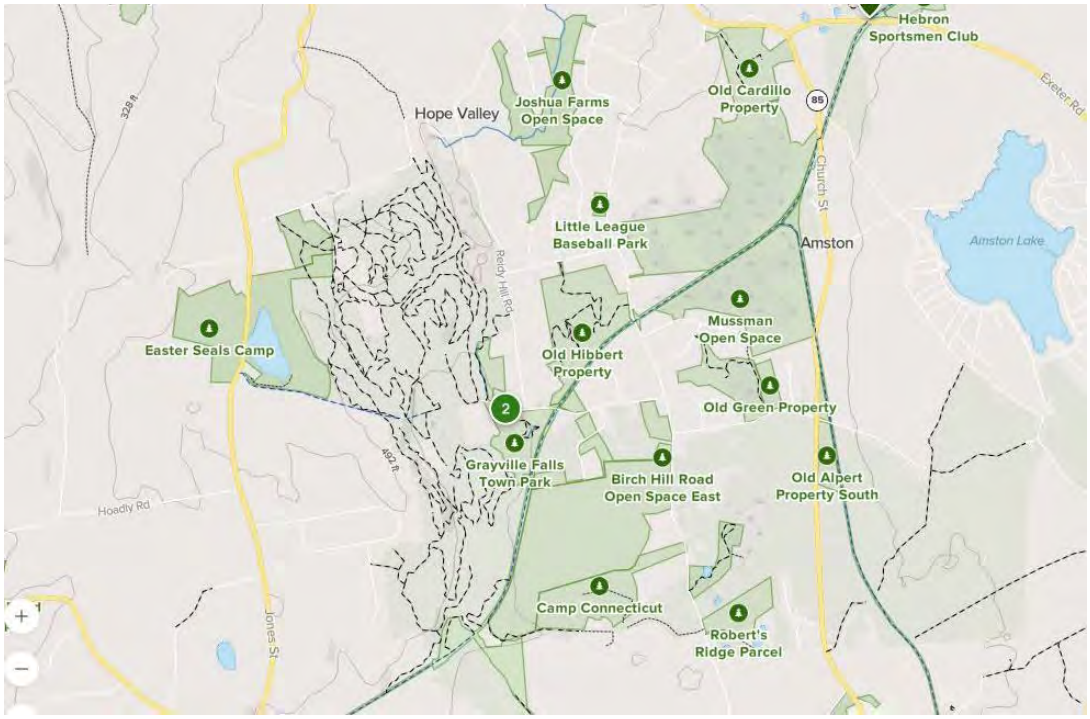
- The town might consider improved accessible pedestrian access from Grayville Falls Parking area to the Air Line State Park Trail through consideration of special grants available from the state, the Eastern Connecticut Community Foundation or similar funding opportunities or work with CTDEEP to provide accessibility parking near the Air Line State Park Trail head on Grayville Road.

- As part of the larger Master Plan for the Air Line State Park Trail, there are opportunities to coordinate with other communities on regional wayfinding and signage. Signage and mapping that illustrates context of the properties to the larger open space system, the resources on site can give both town residents and recreational visitors and conservation supporters the geographic context for their setting.

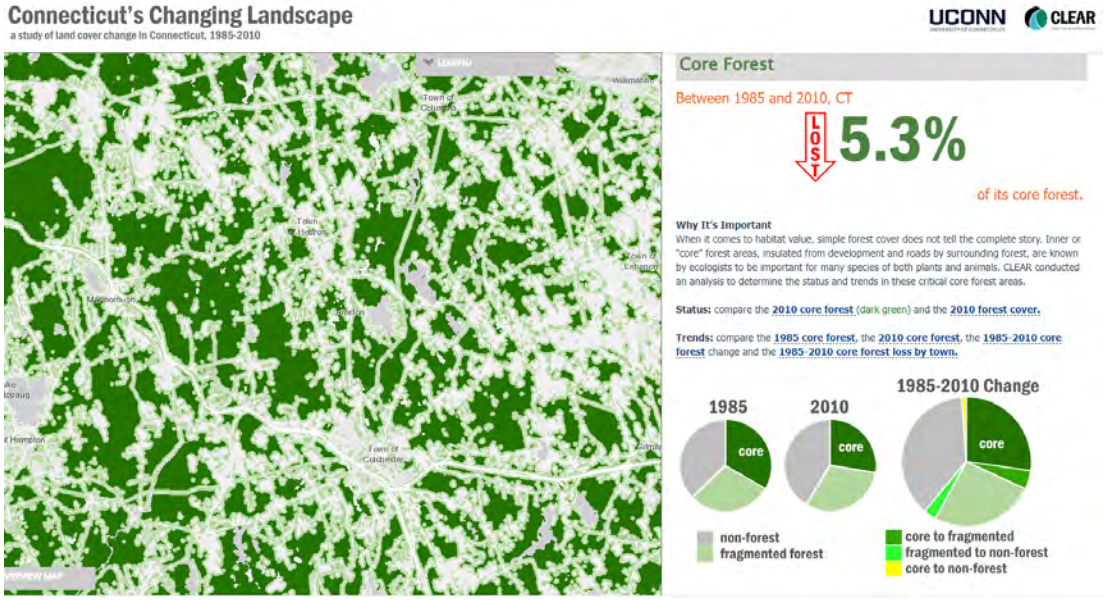
- Forest and open space continuity for both the Hibbert and Bernstein properties are a important component of this area of CT DEEP State Forest and the Air Line State Park Trail. As noted in the forestry section, opportunities toward well designed and science based forest management should be evaluated and enacted in partnership with CTDEEP. While Hebron is not a member, a resource to understand innovation in forest stewardship is The Last Green Valley. This organization has done excellent work with forest stewardship with private and public property owners as well as mapping for forest continuity. https://thelastgreenvalley.org/

- The acquisition of the Bernstein property together with the Hibbert property could progress toward further acquisition and preservation efforts on the part of the State of Connecticut, Hebron and its neighboring towns of Colchester and Marlborough to form a measurable block of forest continuity and natural resource protection as noted in the previous sections of this report.

- In addition to the Pomfret section of the Air Line State Park Trail, this area in Hebron is unique in the amount of scenic and natural resource continuity provided for both conservation and eco-tourism potential on the trail. This would have advantages in a larger marketing effort for the town center and its proximity to an unparallel designation area of ecological preservation and beauty as well as historic relevance.



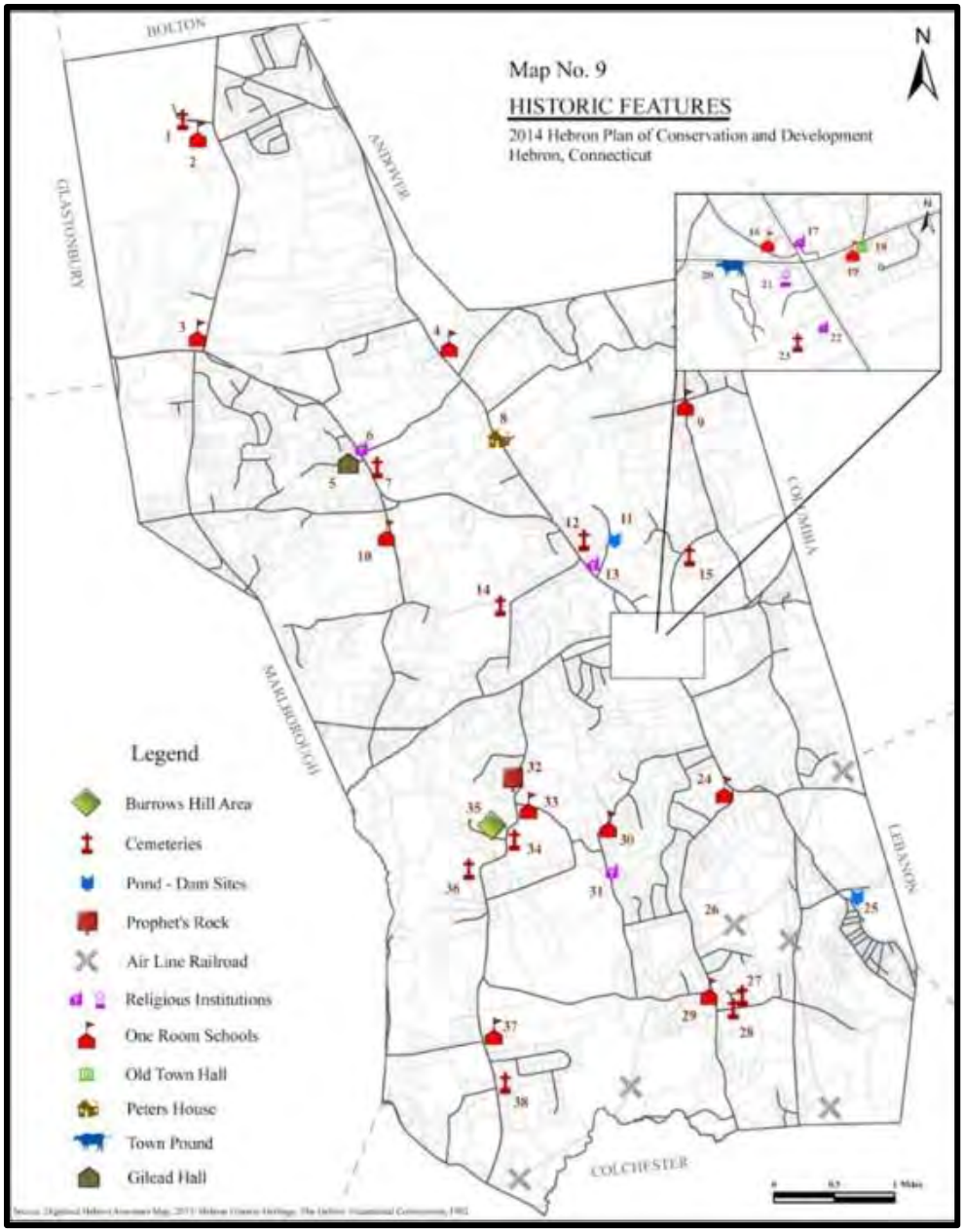
Open space properties as depicted in All Trails website to general public for trail/hiking opportunities. The blocks of town open space with the Salmon River State Forest trails depicted in between the Easter Seals Camp and Grayville Falls Town Park.



- The small business center in Hebron would benefit from the preservation and conservation management of the recreational tourism landscape that is characteristic of the properties and their proximity to adjacent forest tracts, trails, and preserves.
- Look for opportunities to partner with private neighbors near the properties to assist with conservation practice, education and access. An example would be working closely with The Farm at Woodsong Hollow to promote agriculture connections that support conservation practices https://www.thefarmatwoodsonghollow.com/
- The town is a leader in the region in open space acquisition and active commission and committees are encouraged to continue their collective work toward open space management and acquisition for this area. https://hebronct.com/uploads/2022/03/OSLAC.-March-2022-Update.pdf
- Consider installing signage at Grayville Fall parking lot to inform residents and visitors of geographic context with maps and photos and how best to use and visit the properties. This could be done in conjunction with Air Line State Park Trail and its connection to Grayville Falls Park.
- Encourage activities to identify and preserve important open space areas before they are threatened by development.
- Maximize the benefits of open space by giving priority to: Establishment of greenways (for wetland protection and wildlife habitat), open space connections (including trails and wildlife corridors), and forests.
- Where feasible, encourage creation of: multi-purpose trail systems (pedestrian, bicycle, bridle, cross-country ski, as appropriate) that link recreational and open space areas to and from the town center via the Air Line State Park Trail to lower traffic impact on Grayville Road and encourage connections between the center commercial district and its supportive relationship to the eco-tourism for the town and the region.
- Continue work to coordinate open space preservation and trail connections with forests, agriculture, and lands with minimum land use impacts.
- Relative to transportation demands and access, the town will want to fully evaluate the property management options and public access to the Bernstein property based on recommendations and

resource inventories listed in this ERT. Currently the limited access provided by Grayville Road which provides a natural terminus from through traffic may allow a unique opportunity to view the three properties (Grayville Falls Town Park, Hibbert and Bernstein) as a single point destination for recreation as well as conservation management.

- The properties and Air Line State Park Trail are rich with historical context as provided by local historians. See the historic site map. A recommendation would include scoping grant funding to further research the archaeological significance of the area and provide signage for public viewing points on the Air Line State Park Trail.
- A last recommendation is the evaluation of access and use of the Hibbert and Bernstein properties in context with the excellent ongoing connectivity planning, trail planning and open space acquisition to create a unique conservation, recreational and educational opportunity in the Air Line State Park Trail Region.



The Environmental Review Team (ERT) Program is reliant on volunteers who are experts in their field. The recommendations in this report are advisory only. The ERT program is partly funded by the Connecticut Department of Energy and Environmental Protection (CT DEEP) Passport to Parks Program. We are so grateful for our dedicated volunteers and partners.

Thank you!

- CT RC&D ERT Program Staff

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