

To: Ms. Dawn M. McKay
 CT DEEP
 Natural Diversity Database Program
 79 Elm Street
 Hartford, CT 06106-5127

Date: August 26, 2020



Memorandum

Project #: 42517.01

From: Brett Trowbridge, Senior Ecologist
 Jeffrey Shamas, CSS, CE, PWS

Re: 2020 Rare Species Summary
 Greenskies Clean Energy LLC Solar Development Project
 Wapping Road, Rockville Road, Miller Road, and Barber Hill Road
 East Windsor, CT
 NDDDB Preliminary Assessment No.: 201908948

Greenskies Clean Energy LLC is proposing an approximate 5-MW AC photovoltaic electric generating facility solar development of an approximate 32-acre site in East Windsor, CT (the Project). The Project has been sited on an approximately 54-acre property with frontage on Rockville Road and Barber Hill Road, located west of these roads, south of Wapping Road, east of Miller Road, and north of Griffin Road (the Site; see Figure 1).

An August 20, 2019 letter from the Connecticut Department of Energy and Environmental Protection (CT DEEP) Natural Diversity Data Base (NDDDB) indicated that field investigations should be conducted for 14 state-listed species from three taxonomic groups as part of the pre-construction environmental due-diligence and permitting for the Project. Table 1 lists the state-listed species that were requested for evaluation on the Site.

Table 1 State-listed Species Targeted for Investigation

Taxonomic Group	Scientific Name	Common Name	State Status
Invertebrate Animal	<i>Cicindela formosa generosa</i>	Big Sand Tiger Beetle	Special Concern
Invertebrate Animal	<i>Erynnis horatius</i>	Horace's Duskywing	Special Concern
Invertebrate Animal	<i>Margaritifera margaritifera</i>	Eastern Pearlshell	Special Concern
Invertebrate Animal	<i>Sympistis perscripta</i>	Scribbled Sallow Moth	Special Concern
Vertebrate Animal	<i>Accipiter striatus</i>	Sharp-shinned Hawk	Endangered
Vertebrate Animal	<i>Asio flammeus</i>	Short-eared Owl	Threatened
Vertebrate Animal	<i>Falco sparverius</i>	American Kestrel	Special Concern
Vertebrate Animal	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	Endangered
Vertebrate Animal	<i>Passerculus sandwichensis</i>	Savannah Sparrow	Special Concern
Vertebrate Animal	<i>Glyptemys insculpta</i>	Wood Turtle	Special Concern
Vascular Plant	<i>Alopecurus aequalis</i>	Short-awned Meadow Foxtail	Threatened
Vascular Plant	<i>Gaylussacia bigeloviana</i>	Dwarf Huckleberry	Threatened
Vascular Plant	<i>Lygodium palmatum</i>	Climbing Fern	Special Concern
Vascular Plant	<i>Triosteum angustifolium</i>	Narrow-leaved Horse Gentian	Endangered

During May, June, and July 2020, VHB's Senior Ecologist surveyed for state-listed birds and plants and evaluated whether suitable habitat conditions for state-listed invertebrates and Wood Turtle (*Glyptemys insculpta*) exist on the Site. A summary of Site conditions and the survey methodologies and findings of VHB's investigations are presented below.

Site Description

The Site is currently comprised of agricultural fields and unpaved farm roads that border and bisect each field (see Photos 1-8). Three tobacco barns exist along the northeastern, southeastern, and southern Site boundaries (see Photos 1, 8, and 9). Topography on the Site is relatively flat. Elevations range roughly between 200 and 235 feet, and surficial geology consists of thin till (fine-grained, red till; Stone et al. 1992). No wetland features exist on the Site.

During 2020, the northern fields were planted with tobacco and the southern field, contained winter rye (*Secale cereale*; see Photos 1-8). The fields are actively cultivated, and the desirable crops dominate the internal field areas.

Many of the farm roads are subject to frequent travel by farm vehicles and equipment during the growing season and most are hard packed from the repeated compaction (see Photos 9-15). Farm roads through coarser substrate containing softer, loose sand were observed along the southern property boundary and offsite to the north. The farm roads and field edges are sparsely to moderately vegetated with a mix of native and non-native weedy, herbaceous species such as shepherd's-purse (*Capsella bursa-pastoris*), Deptford pink (*Dianthus armeria*), fleabanes (*Erigeron annuus*, *E. canadensis*, and *E. strigosus*), yellow hawkweed (*Hieracium caespitosum*), St. John's-worts (*Hypericum perforatum* and *H. punctatum*), path rush (*Juncus tenuis*), pepperweeds (*Lepidium campestre* and *L. virginicum*), bladder-pod lobelia (*Lobelia inflata*), Italian rye grass (*Lolium multiflorum*), common evening-primrose (*Oenothera biennis*), slender yellow wood sorrel (*Oxalis dillenii*), common Timothy (*Phleum pratense*), plantains (*Plantago lanceolata* and *P. rugelii*), blue grasses (*Poa annua*, *P. compressa*, and *P. nemoralis*), common cinquefoil (*Potentilla simplex*), common selfheal (*Prunella vulgaris*), common sheep sorrel (*Rumex acetosella*), tall rye grass (*Schedonorus arundinaceus*), little bluestem (*Schizachyrium scoparium*), clovers (*Trifolium arvense*, and *T. pratense*), and speedwells (*Veronica arvensis* and *V. peregrina* ssp. *xalapensis*).

Trees on offsite properties line the western and southeastern margins of the Site and hedgerows exist between the northern fields and line portions of the northern Site boundary (see Photos 14 and 15). These wooded and/or thicketed areas include species such as Norway maple (*Acer platanoides*), Amur peppervine (*Ampelopsis glandulosa*), birches (*Betula papyrifera* and *B. populifolia*), hickories (*Carya glabra* and *C. tomentosa*), Asian bittersweet (*Celastrus orbiculatus*), autumn-olive (*Elaeagnus umbellata*), burning-bush (*Euonymus alatus*), white ash (*Fraxinus americana*), Morrow's honeysuckle (*Lonicera morrowii*), Virginia creeper (*Parthenocissus quinquefolia*), cherries (*Prunus pensylvanica* and *P. serotina*), oaks (*Quercus alba* and *Q. velutina*), sumacs (*Rhus glabra* and *R. hirta*), black locust (*Robinia pseudoacacia*), multiflora rose (*Rosa multiflora*), raspberries (*Rubus allegheniensis*, *R. idaeus* and *R. occidentalis*), sassafras (*Sassafras albidum*), poison ivy (*Toxicodendron radicans*), and grapes (*Vitis labrusca* and *V. riparia*).

Surrounding Land Use

Land use surrounding the Site includes agricultural land and sparse residential developments to the north and south, an off-road vehicle course, woodlands, sparse residential developments to the west, and sparse residential developments to the east across Rockville and Barber Hill Roads. Windsorville Pond and its water source, Ketch Brook, are located offsite across Rockville and Barber Hill Roads to the east and across Wapping Road to the north. Dry Brook is located offsite to the southwest.

Rare Species Investigation Methodology

VHB's Senior Ecologist conducted visual, walking, surveys throughout the Site on May 20, May 26, June 8, and July 15, 2020 to survey for state-listed plants and investigate habitat conditions for state-listed animals. Two Savannah Sparrow (*Passerculus sandwichensis*) call survey events were conducted during non-rain conditions starting at 6:30 AM on May 26 and June 8 (i.e., within the late May to late June breeding period per Mass Audubon 2020). Six monitoring stations were established throughout the Site and adjacent fields (See Figure 3). The following procedure was used at each bird monitoring location:

- Record all birds heard or seen for the first 5 minutes;
- Play Savannah Sparrow call recording three times at one-minute intervals; and
- Record all birds responding to the call recording.

Pertinent field notes, such as birds heard or seen throughout the survey area and a list of observed vascular plant species were recorded during investigations and representative photographs were taken. Salient feature locations were recorded using a GPS device. Habitat requirements and life histories were considered for each of the NDDB-identified state-listed species during each site investigation event.

Invertebrate Findings

Big Sand Tiger Beetle (State Special Concern)

The Big Sand Tiger Beetle (*Cicindela formosa* ssp. *generosa*), one of the largest North American tiger beetles, inhabits dry areas of loose sand that are barren or sparsely vegetated (Pearson et al. 2015). Dry barren areas occur within the Site's farm roads, however, many of these roads contain compacted soil or are heavily used by farm vehicles (see Photos 9-15). No tiger beetles were observed within the hard-packed roads or within well-trafficked roads containing looser soils. These areas do not provide exemplary habitat for Big Sand Tiger Beetles, because of their unsuitable physical characteristics and/or the frequent disruption from passing vehicles (i.e., direct mortality via crushing or repeated collapsing of burrows and interruption of hunting). Less traveled farm roads with loose, sandy soil were observed along the southern Site boundary and offsite to the north (see Photos 16-18; Figure 2). Tiger beetles from at least two taxa of were observed within these areas, however, the beetles were not captured or identified to species (see Photos 19-21).

To ensure protection of the state-listed Big Sand Tiger Beetle, VHB recommends that the tiger beetle habitat areas shown on Figure 2 be protected during construction by avoiding the use of those farm roads for construction access during the late spring to early fall Big Sand Tiger Beetle flight period.

Horace's Duskywing (State Special Concern)

Horace's Duskywing (*Erynnis horatius*), a spread-wing skipper (Family Hesperidae, Subfamily Pyrginae) is known to occur within various open habitats including fields, clearings, open woodlands, roadsides, and utility rights-of-way (Butterflies and Moths of America 2020). Red and black oaks (*Quercus rubra* and *Q. velutina*) are the preferred host plants for Horace's Duskywing larvae (Mello and Hansen 2004).

The various herbs that border the agricultural field offer foraging opportunities. Black and white oak (*Q. alba*) trees (i.e., potential larval host plants) exist within the wooded areas west of the Site and occasionally within hedgerows. However, the Project does not include tree cutting. Therefore, potential habitat conditions along the borders of the

Site will be unaffected by proposed Site development. Protection measures are not proposed for Horace's Duskywing since we the observed potential habitat are outside of the site development boundaries.

Eastern Pearlshell (State Special Concern)

The Eastern Pearlshell (*Margaritifera margaritifera*) is a relatively large freshwater mussel that occurs within cold, well-oxygenated streams and rivers, typically with sand, gravel, and/or cobble bottoms (NH F&G 2015 and 2020). No suitable habitat for the Eastern Pearlshell exists on the Site and protection measures are not proposed for this species.

Scribbled Sallow Moth (State Special Concern)

The Scribbled Sallow Moth (*Sympistis perscripta*) is known to occur in dry open areas (i.e., fields, outcrops, dunes, disturbance areas, etc.) that support larval food plants. In the northeast, Scribbled Sallow Moth feed on the reproductive parts of old-field toadflax (*Nuttallanthus canadensis*; NY NHP 2020), a common annual or biennial plant of dry, sandy areas and anthropogenic habitats (Fernald 1950, Gleason and Cronquist 1991, Haines 2011).

Old-field toadflax was found to occur along the eastern edge of the farm road located along the western Site boundary, within the farm road in the southern portion of the Site, and within a farm road offsite to the south (see Photos 22-24 and Figure 2). These areas provide suitable potential habitat for the Scribbled Sallow Moth. Each of these areas are subject to periodic disturbance, which both causes destruction of these plants (see Photo 25) and maintains habitat conditions for the plant population to persist. The Site is expected to continue to support old-field toadflax following Site development and protection measures are not proposed for the Scribbled Sallow Moth.

Bird Findings

Photographs numbers 7 and 26 through 30 show conditions from each bird call survey station. Bird observations (visual or calls heard) throughout the Site and adjacent survey areas indicated use by a mix of species that prefer edges and various open habitats including areas of human habitation. Cosmopolitan species such as American robin (*Turdus migratorius*), blue jay (*Cyanocitta cristata*), and mourning dove (*Zenaida macroura*) were observed frequently. Commonly encountered open habitat species included barn swallow (*Hirundo rustica*), northern flicker (*Colaptes auratus*), and song sparrow (*Melospiza melodia*). Birds preferring thickets, forest edges, and woodlands, such as common yellowthroat (*Geothlypis trichas*), eastern towhee (*Pipilo erythrophthalmus*), gray catbird (*Dumetella carolinensis*), yellow warbler (*Dendroica petechial*), were regularly heard or seen beyond agricultural field areas in the hedgerow vegetation patches. Table 2 provides a complete list of bird species observed during 2020 monitoring.

A Brown Thrasher (*Toxostoma rufum*; CT Species of Special Concern) was observed calling from within a hedgerow along the northern Site boundary on May 26, 2020. The bird was heard calling from a perch in a tree (see Photo 31) before a short flight to the ground along the hedgerow. It ran and hopped along the ground for a few moments before retreating into the hedgerow. This somewhat secretive species inhabits edges and scrub habitats such as primary regrowth areas after deforestation (Cornell Lab of Ornithology 2019b). Whereas the Project does not involve removal of hedgerows, habitat for this species will not be altered by the Site development. Protection measures are therefore not proposed for the Brown Thrasher.

Table 2 2020 Bird Observation Summary

Common Name	Scientific Name	Date		26 May 2020						8 Jun 2020						20 May – 15 July 2020
				Monitoring Area						Monitoring Area						Outside monitoring area
		1	2	3	4	5	6	1	2	3	4	5	6			
American goldfinch	<i>Spinus tristis</i>	x						x			x				x	
American robin	<i>Turdus migratorius</i>	x	x		x	x	x	x	x	x	x	x	x	x	x	
barn swallow	<i>Hirundo rustica</i>					x	x				x	x			x	
blue jay	<i>Cyanocitta cristata</i>	x	x	x		x	x	x	x	x	x	x	x		x	
brown thrasher	<i>Toxostoma rufum</i>														x	
Canada goose	<i>Branta canadensis</i>									x					x	
Carolina wren	<i>Thryothorus ludovicianus</i>								x	x						
chipping sparrow	<i>Spizella passerina</i>					x					x					
common grackle	<i>Quiscalus quiscula</i>	x		x	x										x	
common yellowthroat	<i>Geothlypis trichas</i>	x	x										x	x		
cowbird	<i>Molothrus sp.</i>				x	x								x	x	
crow	<i>Corvus sp.</i>												x		x	
downy woodpecker	<i>Picoides pubescens</i>				x											
eastern phoebe	<i>Sayornis phoebe</i>						x							x	x	
eastern towhee	<i>Pipilo erythrophthalmus</i>			x	x				x	x					x	
eastern wood pewee	<i>Contopus virens</i>														x	
European starling	<i>Sturnus vulgaris</i>														x	
gray catbird	<i>Dumetella carolinensis</i>	x	x	x	x	x	x	x					x	x	x	
great blue heron	<i>Ardea herodias</i>					x									x	
house finch	<i>Haemorhous mexicanus</i>	x				x										
house sparrow	<i>Passer domesticus</i>														x	
indigo bunting	<i>Passerina cyanea</i>														x	
killdeer	<i>Charadrius vociferous</i>										x					
mourning dove	<i>Zenaida macroura</i>		x	x			x		x					x	x	
northern cardinal	<i>Cardinalis cardinalis</i>			x					x	x					x	
northern flicker	<i>Colaptes auratus</i>			x	x		x							x		
northern mockingbird	<i>Mimus polyglottos</i>			x												
purple finch	<i>Haemorhous purpureus</i>				x											
red-eyed vireo	<i>Vireo olivaceus</i>						x									
red-tailed hawk	<i>Buteo jamaicensis</i>						x							x	x	
red-winged blackbird	<i>Agelaius phoeniceus</i>														x	
song sparrow	<i>Melospiza melodia</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
tree swallow	<i>Tachycineta bicolor</i>														x	
turkey vulture	<i>Cathartes aura</i>												x		x	
wood thrush	<i>Hylocichla mustelina</i>	x	x										x		x	
yellow warbler	<i>Dendroica petechial</i>			x	x		x	x	x		x					

Sharp-shinned Hawk (State Endangered)

The Sharp-shinned Hawk (*Accipiter striatus*), a relatively small, secretive raptor which preys primarily on small birds and mammals, nests within intact mixed coniferous-deciduous forested areas, and hunts within various open areas including residential lawns containing bird feeders (CT DEEP 1999a, Cornell Lab of Ornithology 2019e, Mass Audubon 2020d). Nesting habitat does not exist on the Site and any potential hunting habitat will not be altered by Site development; therefore, protection measures are not proposed for the Sharp-shinned Hawk.

Short-eared Owl (State Threatened)

The ground-nesting Short-eared Owl (*Asio flammeus*) inhabits various open habitats and preys on small mammals, small birds, and insects (CT DEEP 1999b, Cornell Lab of Ornithology 2019f, Mass Audubon 2020e). The agricultural fields found on the Site do not provide suitable nesting habitat for Short-eared Owls, and because potential hunting habitat along the margins of the Site will persist after Site development, Short-eared Owl protection measures are not proposed.

American Kestrel (State Special Concern)

American Kestrel (*Falco sparverius*) is a small, cavity-nesting falcon that occupies various open habitats where it hunts within areas of sparse and/or low vegetation from fence posts, utility poles, and isolated tree and snags (Cornell Lab of Ornithology 2019a, Mass Audubon 2020a). Although the Site's agriculture fields are open (non-canopied), areas of sparse or low vegetation are limited to the margins. The agricultural crops observed within and adjacent to the Site during VHB's 2020 investigations (tobacco, winter rye, and corn) are tall at maturity and unsuitable for foraging by American Kestrels. Potential nesting cavities, a bird box in the north, a tree cavity in hedgerow, and a southwestern woodland edge, are limited to the margins of the Site (see Photos 32-34 and Figure 3) will be unaffected by Site development. Protection measures are not proposed for American Kestrel.

Red-headed Woodpecker (State Endangered)

Open deciduous forest, groves of large trees bordering open areas, and wooded swamps provide typical habitats for the cavity-nesting Red-headed Woodpecker (*Melanerpes erythrocephalus*; CT DEEP 2016, Cornell Lab of Ornithology 2019c, Mass Audubon 2020b). Acorns from offsite oaks provide a potential food source for Red-headed Woodpeckers and the previously noted nesting cavities along the margins of the Site (see Photos 32-34 and Figure 3) provide potential nesting opportunities. However, these potential habitat features will be unaffected by Site development and protection measures are not proposed for Red-headed Woodpecker.

Savannah Sparrow (State Special Concern)

The Savannah Sparrow (*Passerculus sandwichensis*) is a ground-nesting bird of open habitats such as grasslands, pastures, saltmarshes, and agricultural fields planted with low crops (Cornell Lab of Ornithology 2019d, Mass Audubon 2020c). Because of the associated disturbance from cultivation activities, the northern tobacco fields did not provide suitable Savannah Sparrow nesting habitat during 2020. Marginal potential nesting habitat was available within the southern field, which included winter rye cover during VHB's 2020 investigations. However, the rye grass in this area was uniformly tall, which did not offer exemplary conditions for nesting by this species. In addition, Savannah Sparrow were not detected during dedicated surveys for this species. Given the active agricultural use and variable treatment of the Site's fields, there are only limited, somewhat unpredictable opportunities for successful nesting by Savannah Sparrows on the Site. Therefore, protection measures are not proposed for Savannah Sparrow.

Wood Turtle Findings (State Special Concern)

Wood Turtle (*Glyptemys insculpta*) habitat use is centered around perennial streams, where they overwinter. This species uses a variety of habitats during spring and summer for foraging including woodlands, grassy fields, and wetland edges. Man-made habitat features such as utility corridors, gravel extraction sites, fields, and lawns are used for nesting by Wood Turtles (CT DEEP 2011, Klemens 1993, MA NHESP 2015a). No overwintering habitat exists on the Site. The active agriculture on the Site does not provide suitable foraging habitat. The open (non-planted), well-drained areas of the Site provide suitable potential nesting habitat for Wood Turtles.

Windsorville Pond, part of the Ketch Brook wetland system which could provide potential primary aquatic habitat for Wood Turtles, is located approximately 500 feet east of the Site across Rockville Road. And Dry Brook, located approximately 1,300 feet to the southwest of the Site, may also provide suitable primary potential aquatic habitat. Because suitable nesting habitats exist in closer proximity to the Ketch Brook wetland system (i.e., fields and residential lawns) it is unlikely that Wood Turtle would migrate across Rockville Road to nest on the Site. Likewise, because suitable potential nesting habitat (i.e., edges of offsite agricultural fields or an electrical transmission corridor) exists in closer proximity to Dry Brook, it is unlikely that Wood Turtles would migrate to the Site for nesting. Therefore, protection measures for Wood Turtle are not proposed.

Vascular Plant Survey Findings

No state-listed plants were detected on the Site during 2020 surveys. Approximately 184 vascular plant taxa were observed, and a list of the vascular plant species observed on and near the Site is presented within Appendix 2.

Short-awned Meadow Foxtail (State Threatened)

Short-awned Meadow Foxtail (*Alopecurus aequalis*) is a perennial grass with an obligate wetland classification designation that typically occurs within shallow water, wet meadows, ditches, shorelines, and wet disturbed areas (Fernald 1950, Gleason and Cronquist 1991, Haines 2011). This species was not detected during VHB's surveys and habitat for this species does not occur on the Site. Protection measures for Short-awned Meadow Foxtail are not proposed.

Dwarf Huckleberry (State Threatened)

Dwarf Huckleberry (*Gaylussacia bigeloviana*) is a rhizomatous, low heath with an obligate wetland classification designation that occurs within wet sandy soil, peatlands (bogs and fens), and heathlands (Fernald 1950, Gleason and Cronquist 1991, Haines 2011). This species was not detected during VHB's surveys and habitat for this species does not occur on the Site. Protection measures for Dwarf Huckleberry are not proposed.

Climbing Fern (State Special Concern)

Climbing Fern (*Lygodium palmatum*) occurs within acidic soils of moist thickets, forest edges, open mixed woods (Fernald 1950, Gleason and Cronquist 1991, Haines 2011, MA NHESP 2015b). This species occurs primarily within wetlands (i.e., FACW wetland classification designation) and habitat for this species does not occur on the Site. Climbing Fern was not detected during VHB's surveys. Climbing plants observed along the edges of the Site along forest edges or within hedgerows included Amur peppervine, Asian bittersweet, Virginia creeper, poison ivy, and fox and river grapes. Protection measures for Climbing Fern are not proposed.

Narrow-leaved Horse Gentian (State Endangered)

Narrow-leaved Horse Gentian (*Triosteum angustifolium*) is a perennial herb that occurs within rocky woodlands and thickets, ledges, and along railroads (Fernald 1950, Gleason and Cronquist 1991, Haines 2011). This species was not detected during VHB's surveys and rocky habitat for this species does not occur on the Site. Protection measures for Narrow-leaved Horse Gentian are not proposed.

Several invasive plants were observed on or near the Site including Amur peppervine, Japanese barberry (*Berberis thunbergii*), Asian bittersweet, autumn-olive, burning-bush, gill-over-the-ground (*Glechoma hederacea*), honeysuckles (*L. morrowii* and *L. x bella*), purple loosestrife (*Lythrum salicaria*), reed canary grass (*Phalaris arundinacea*), flat-stemmed blue grass (*P. compressa*), black locust, multiflora rose, and common sheep sorrel.

Conclusions

Over several days during 2020, VHB's biologist investigated the Site for state-listed species, which resulted in the detection of a single state-listed animal species: Brown Thrasher. Several species listed within CT DEEP's preliminary response letter were either not detected or suitable habitat conditions do not exist on the Site. Table 3 summarizes VHB's 2020 state-listed species findings and suggested protection measures.

Table 3 State-listed Species Investigation Summary

Scientific Name	Common Name	Suitable Habitat Present	Detected during 2020	Protection Recommended
<i>Cicindela formosa generosa</i>	Big Sand Tiger Beetle	Yes	No	Avoid suitable habitat or presence/absence surveys
<i>Erynnis horatius</i>	Horace's Duskywing	Offsite	No	None
<i>Margaritifera margaritifera</i>	Eastern Pearlshell	No	No	None
<i>Sympistis perscripta</i>	Scribbled Sallow Moth	Yes	No	None
<i>Accipiter striatus</i>	Sharp-shinned Hawk	Hunting	No	None
<i>Asio flammeus</i>	Short-eared Owl	Hunting	No	None
<i>Falco sparverius</i>	American Kestrel	Nesting	No	None
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	Yes	No	None
<i>Passerculus sandwichensis</i>	Savannah Sparrow	No	No	None
<i>Toxostoma rufum</i>	Brown Thrasher	Yes	Yes	None
<i>Glyptemys insculpta</i>	Wood Turtle	Nesting	No	None
<i>Alopecurus aequalis</i>	Short-awned Meadow Foxtail	No	No	None
<i>Gaylussacia bigeloviana</i>	Dwarf Huckleberry	No	No	None

<i>Lygodium palmatum</i>	Climbing Fern	No	No	None
<i>Triosteum angustifolium</i>	Narrow-leaved Horse Gentian	No	No	None

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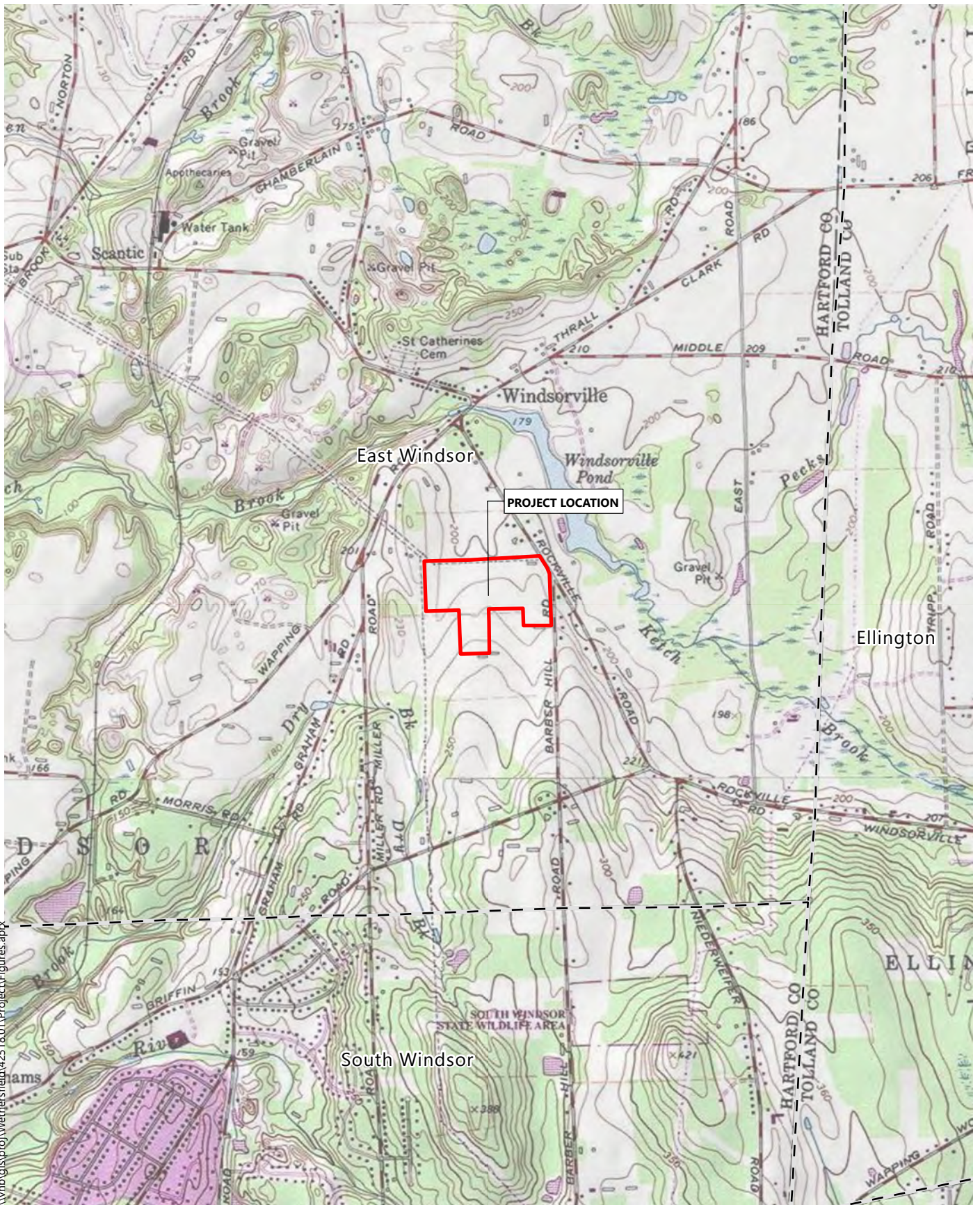
Figures

- Figure 1 Site Locus
- Figure 2 State-listed Invertebrate Findings
- Figure 3 State-listed Bird Findings

Attachments

- Attachment 1 Site Photographs
- Attachment 2 Observed Vascular Plant List
- Attachment 3 Biologist Qualifications
Brett Trowbridge, Senior Ecologist

Figure 1 Site Locus



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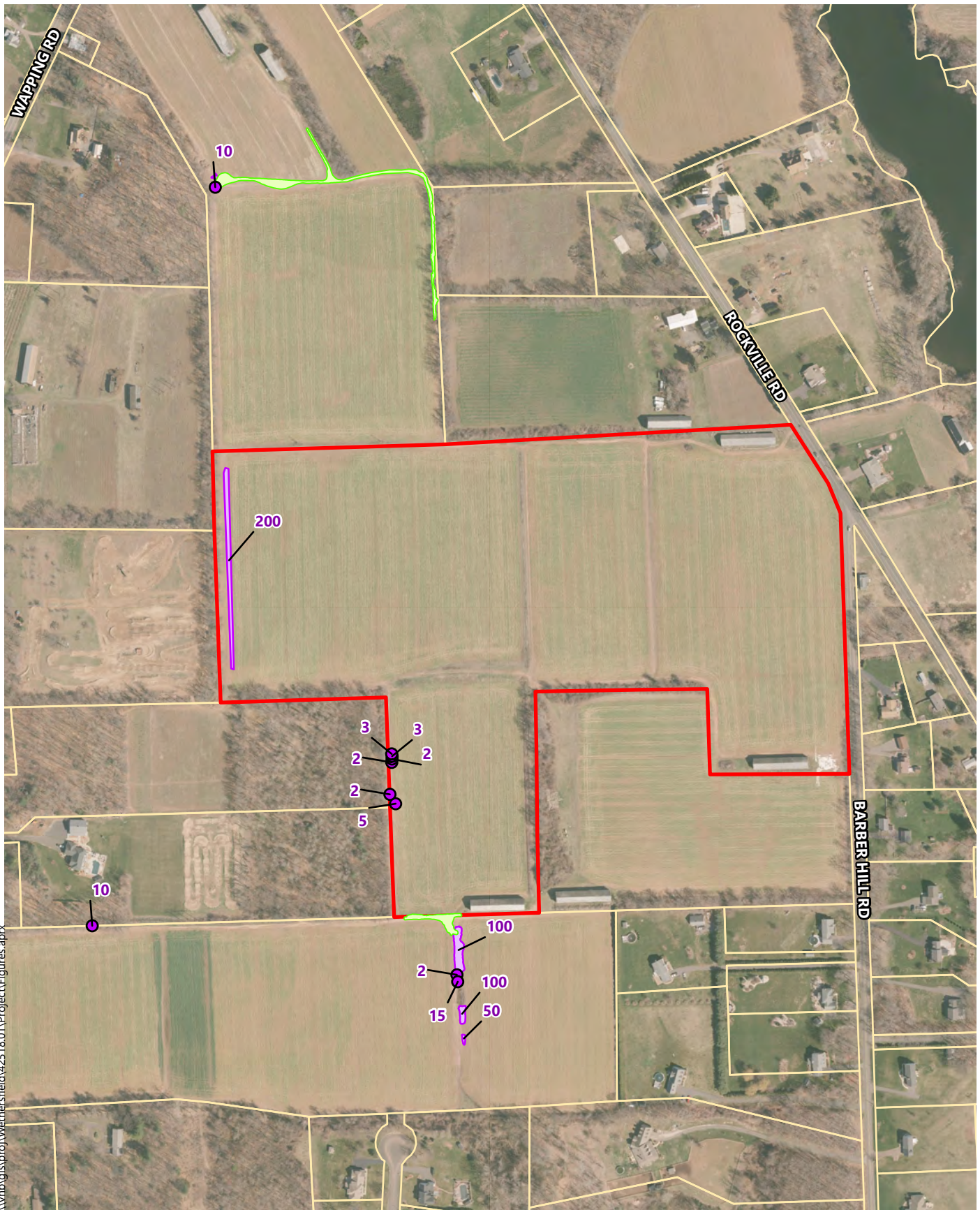
- Property Boundary
- Town Boundary

Mulnite Farms

East Windsor, Connecticut

USGS Locus Map

Figure 2 State-listed Invertebrate Findings



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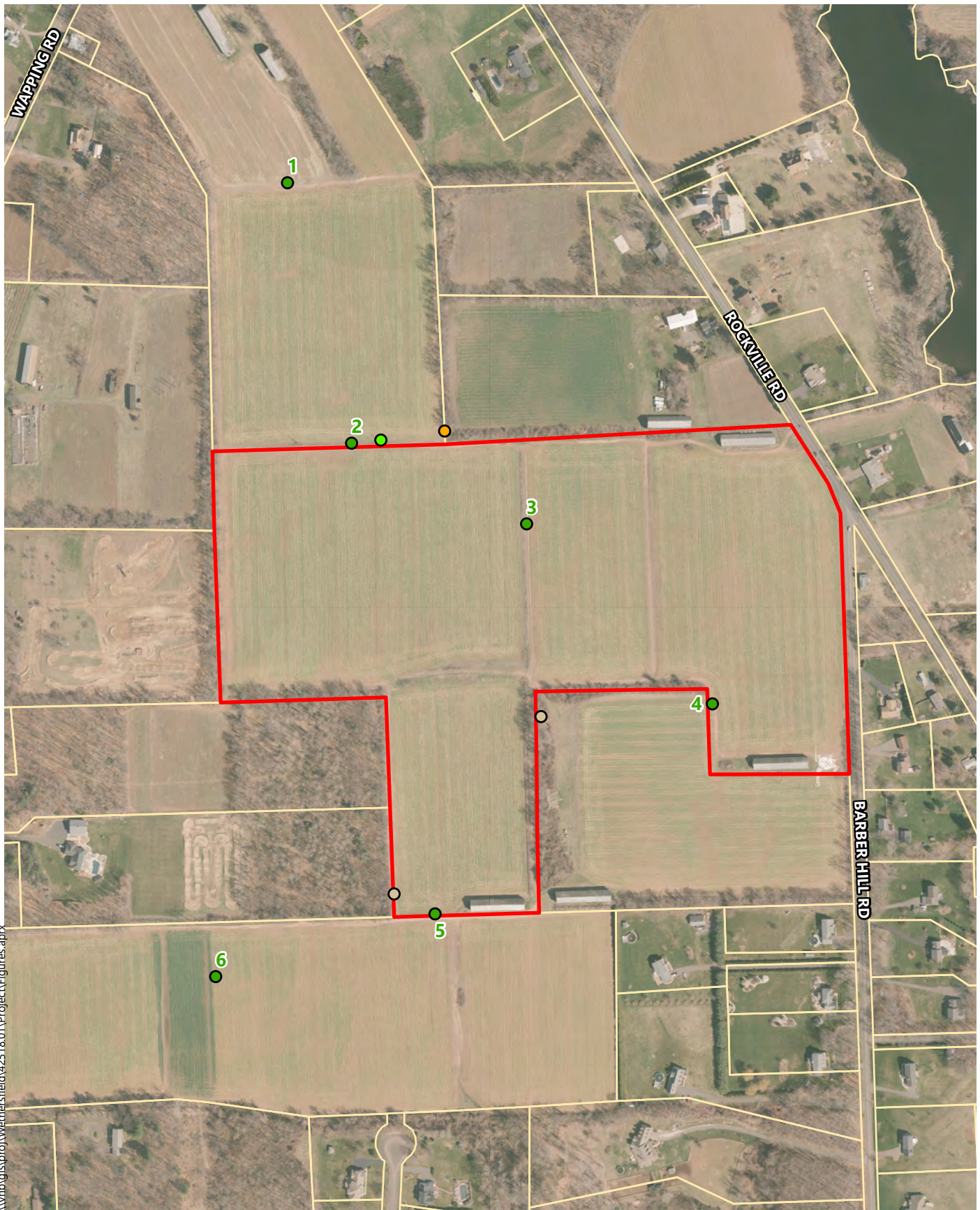
Mulnite Farms

East Windsor, Connecticut

- Property Boundary
- Parcel Boundaries
- Nuttalanthus canadensis (July 2020)
- Nuttalanthus canadensis (July 2020)
- Tiger Beetle Habitat (July 2020)

State-listed Invertebrate Findings

Figure 3 State-listed Bird Findings



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Mulnite Farms

East Windsor, Connecticut

- Property Boundary
- Parcel Boundaries
- Bird Call Survey Stations
- Bird Box
- Tree Cavities
- Brown Thrasher (May 26, 2020)

State-listed Bird Findings

Attachment 1 Site Photographs

Photo 1.



Description:

Northerly view of the eastern agricultural field and Site access from Barber Hill Road. At the time of the photo, the field had been recently planted with tobacco. The tobacco barns on the left in the background are along the northern Site boundary.

May 20, 2020



Photo 2.



Description:

Easterly view of the eastern tobacco field and the hardpacked access road and hedgerow along the Site boundary. The structures in the background are houses along Barber Hill and Rockville Roads.

July 15, 2020

<p>Photo 3.</p>  <p>A photograph showing a northern view of two tobacco fields separated by a hedgerow. The fields are filled with rows of young tobacco plants. The hedgerow is a dense line of green shrubs. In the background, there is a utility pole on the left and a line of trees. The sky is blue with some light clouds.</p>	<p>Description:</p> <p>Northerly view of the western (left) and eastern (right) tobacco fields and the hedgerow between them. The utility pole on left and shrubby hedgerow at midframe are located along the northern Site boundary</p> <p>June 8, 2020</p>
<p>Photo 4.</p>  <p>A photograph showing a northwesterly view of two tobacco fields separated by a hedgerow. The fields are filled with rows of young tobacco plants. The hedgerow is a dense line of green shrubs. In the background, there is a utility pole on the left and a line of trees. The sky is overcast with grey clouds.</p>	<p>Description:</p> <p>Northwesterly view of the western (left) and eastern (right) tobacco fields and the hedgerow between them.</p> <p>July 15, 2020</p>

<p>Photo 5.</p> 	<p>Description:</p> <p>Southeasterly view of the Site from its northwestern corner. The western field in the foreground was recently planted with tobacco when the photo was taken. The wooded area on the right is an offsite forest area. The southern agricultural field (planted with rye during 2020) is the green open area seen at center.</p> <p>May 26, 2020</p>
<p>Photo 6.</p> 	<p>Description:</p> <p>Southeasterly view of the Site from just beyond its northwestern corner. The offsite field on left was planted with corn and the western tobacco field is seen at midframe. The southern agricultural field its drying winter rye is the tan open area seen at center beyond the tobacco field.</p> <p>July 15, 2020</p>


<p>Photo 7.</p> 	<p>Description:</p> <p>Northerly view of the southern agricultural field (planted within rye during 2020) from bird call survey station 5 along the southern Site boundary.</p> <p>June 8, 2020</p>
<p>Photo 8.</p> 	<p>Description:</p> <p>Southwesterly view of the southern agricultural field from along its easterly hedgerow. The trees at right and in the background are offsite. The tobacco barn on the left is located along the southern Site boundary.</p> <p>May 26, 2020</p>

Photo 9.



Description:

Easterly view of the heavily used farm road and tobacco barn along the southeastern Site boundary.

May 20, 2020

Photo 10.



Description:

Northerly view of hardpacked farm road and low hedgerow between the western (left) and eastern (right) tobacco fields.

May 20, 2020

Photo 11.



Description:

Southerly view of the farm road and hedgerows located east of the southern agricultural field.

May 20, 2020

Photo 12.



Description:

Easterly view of the farm road and utility alignment along the northern Site boundary from bird call survey station 2.

June 8, 2020

Photo 13.



Description:

Westerly view of the farm road and tobacco barn along the northern Site boundary near the Site access from Rockville Road.

July 15, 2020

Photo 14.



Description:

Southerly view of the wooded edge, farm road, and western tobacco field along the western Site boundary. The strip between the farm road and the agricultural field was recently mown when the photograph was taken.

July 15, 2020

Photo 15.



Description:

Southerly view of the wooded edge, farm road, and western side of the southern field along the southeastern Site boundary.

July 15, 2020

Photo 16.



Description:

Easterly view of tiger beetle habitat within the farm road located along the southern Site boundary.

July 15, 2020

Photo 17.



Description:

Northerly view of the loose sandy tiger beetle habitat located along the southern Site boundary.

July 15, 2020

Photo 18.



Description:

Easterly view of tiger beetle habitat located within an offsite farm road north of the Site.

May 20, 2020

Photo 19.



Description:

Tiger beetle copulation observed within a farm road north of the Site.

May 20, 2020

Photo 20.



Description:

Tiger beetle copulation observed within the farm road located along the southern Site boundary.

July 15, 2020

Photo 21.



Description:

Long-legged tiger beetle without distinctive elytral maculations observed within the northern offsite habitat area.

July 15, 2020

Photo 22.



Description:

Old-field toadflax in flower along the eastern edge of the farm road located along the western Site boundary.

June 8, 2020

Photo 23.



Description:

Old-field toadflax along the eastern edge of the farm road located along the western Site boundary.

June 8, 2020

Photo 24.



Description:

Old-field toadflax with fruiting capsules located offsite near the southern Site boundary.

July 15, 2020

Photo 25.



Description:

Old-field toadflax mowed down during vegetation management around the western edge of the western tobacco field.

July 15, 2020

Photo 26.



Description:

Southerly view from bird call survey station 1. The offsite field seen here was recently sprayed with herbicide prior to planting corn.

May 26, 2020

<p>Photo 27.</p> 	<p>Description:</p> <p>Southerly view of the western tobacco field from bird call survey station 2.</p> <p>June 8, 2020</p>
<p>Photo 28.</p> 	<p>Description:</p> <p>Northwesterly view from bird call survey station 3.</p> <p>May 20, 2020</p>

Photo 29.



Description:

Northerly view of the eastern tobacco field from bird call survey station 4.

June 8, 2020

Photo 30.



Description:

Easterly view from bird call survey station 6. The offsite agricultural field seen here was recently planted with corn after the winter rye cover was sprayed with herbicide.

June 8, 2020

Photo 31.



Description:

Brown thrasher heard calling from a perch in a tree within a hedgerow north of the Site.

May 26, 2020



Photo 32.



Description:

Northerly view of a bird box on a utility pole along the northern Site boundary. No activity was observed at this box during site investigations.

May 26, 2020

Photo 33.	Description:
	<p>Westerly view of a tree cavity within an offsite hedgerow. No activity was observed at this cavity during site investigations.</p> <p>May 26, 2020</p>
Photo 34.	Description:
	<p>Westerly view of a tree cavity offsite along the southeastern Site boundary. No activity was observed at this cavity during site investigations.</p> <p>June 8, 2020</p>

Attachment 2 Observed Vascular Plant List

	<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
1	<i>Acer rubrum</i>	red maple	Native
2	<i>Acer platanoides</i>	Norway maple	Non-native
3	<i>Acer saccharinum</i>	silver maple	Native
4	<i>Acer saccharum</i>	sugar maple	Native
5	<i>Achillea millefolium</i>	common yarrow	Native
6	<i>Agrostis capillaris</i>	colonial bentgrass	Non-native
7	<i>Agrostis scabra</i>	rough bentgrass	Native
8	<i>Alliaria petiolata</i>	garlic-mustard	Non-native
9	<i>Amaranthus hybridus</i>	green amaranth	Non-native
10	<i>Ambrosia artemisiifolia</i>	common ragweed	Native
11	<i>Amelanchier laevis</i>	smooth serviceberry	Native
12	<i>Ampelopsis glandulosa</i>	Amur peppervine	Invasive
13	<i>Anthoxanthum odoratum</i>	sweet vernalgrass	Non-Native
14	<i>Apocynum cannabinum</i>	hemp dogbane	Native
15	<i>Arabidopsis thaliana</i>	mouse-ear thale-cress	Non-native
16	<i>Arisaema triphyllum ssp. triphyllum</i>	Jack-in-the-pulpit	Native
17	<i>Artemisia vulgaris</i>	common wormwood	Non-native
18	<i>Asclepias syriaca</i>	common milkweed	Native
19	<i>Barbarea verna</i>	early yellow-rocket	Non-native
20	<i>Barbarea vulgaris</i>	garden yellow-rocket	Non-native
21	<i>Berberis thunbergii</i>	Japanese barberry	Invasive
22	<i>Betula papyrifera</i>	paper birch	Native
23	<i>Betula populifolia</i>	gray birch	Native
24	<i>Bromus commutatus</i>	meadow brome	Non-native
25	<i>Bromus tectorum</i>	cheat brome	Non-native
26	<i>Bulbostylis capillaris</i>	tufted hair-sedge	Native
27	<i>Capsella bursa-pastoris</i>	shepherd's-purse	Non-native
28	<i>Carex annectens</i>	yellow-fruited sedge	Native
29	<i>Carex normalis</i>	greater straw sedge	Native
30	<i>Carex pensylvanica</i>	Pennsylvania sedge	Native
31	<i>Carex scoparia</i>	pointed broom sedge	Native
32	<i>Carex vulpinoidea</i>	common fox sedge	Native
33	<i>Carya glabra</i>	pignut hickory	Native
34	<i>Carya tomentosa</i>	mockernut hickory	Native
35	<i>Catalpa speciosa</i>	northern catalpa	Non-native
36	<i>Celastrus orbiculatus</i>	Asian bittersweet	Invasive
37	<i>Cerastium arvense</i>	field chickweed	Non-native
38	<i>Chenopodium album</i>	lambsquarters	Non-native
39	<i>Corylus americana</i>	American hazelnut	Native
40	<i>Crataegus sp.</i>	hawthorn	
41	<i>Crepis tectorum</i>	narrow-leaved hawk's-beard	Non-native
42	<i>Dactylis glomerata</i>	orchard grass	Non-native
43	<i>Daucus carota</i>	wild carrot	Non-native
44	<i>Dennstaedtia punctilobula</i>	eastern hay-scented fern	Native
45	<i>Desmodium perplexum</i>	perplexed tick-trefoil	Native
46	<i>Dianthus armeria</i>	Deptford pink	Non-native

Attachment 2. Observed Vascular Plant List

47	<i>Dichanthelium clandestinum</i>	deer-tongue rosette-panicgrass	Native
48	<i>Draba verna</i>	spring draba	Non-native
49	<i>Dryopteris intermedia</i>	evergreen wood fern	Native
50	<i>Elaeagnus umbellata</i>	autumn-olive	Invasive
51	<i>Eleusine indica</i>	goosegrass	Non-native
52	<i>Erigeron annuus</i>	annual fleabane	Native
53	<i>Erigeron canadensis</i>	Canada fleabane	Native
54	<i>Erigeron strigosus</i>	rough fleabane	Native
55	<i>Euonymus alatus</i>	burning-bush	Invasive
56	<i>Fallopia convolvulus</i>	black bindweed	Non-native
57	<i>Fragaria virginiana</i>	common strawberry	Native
58	<i>Fraxinus americana</i>	white ash	Native
59	<i>Galinsoga quadriradiata</i>	common quickweed	Non-native
60	<i>Galium aparine</i>	scratch bedstraw	Native
61	<i>Galium mollugo</i>	whorled bedstraw	Non-native
62	<i>Glechoma hederacea</i>	gill-over-the-ground	Invasive
63	<i>Gypsophila muralis</i>	low baby's-breath	Non-native
64	<i>Hieracium caespitosum</i>	yellow hawkweed	Non-native
65	<i>Houstonia caerulea</i>	little bluet	Native
66	<i>Hypericum perforatum</i>	common St. John's-wort	Non-native
67	<i>Hypericum punctatum</i>	spotted St. John's-wort	Native
68	<i>Ilex verticillata</i>	common winterberry	Native
69	<i>Impatiens capensis</i>	jewelweed	Native
70	<i>Juglans cinerea</i>	butternut	Native
71	<i>Juncus effusus</i>	common soft rush	Native
72	<i>Juncus tenuis</i>	path rush	Native
73	<i>Juniperus virginiana</i>	eastern red cedar	Native
74	<i>Lactuca biennis</i>	tall blue lettuce	Native
75	<i>Lechea mucronata</i>	hairy pinweed	Native
76	<i>Lepidium campestre</i>	field pepperweed	Non-native
77	<i>Lepidium virginicum</i>	poor-man's pepperweed	Native
78	<i>Lespedeza capitata</i>	round-headed bush-clover	Native
79	<i>Lespedeza hirta</i>	hairy bush-clover	Native
80	<i>Leucanthemum vulgare</i>	ox-eye daisy	Non-native
81	<i>Lobelia inflata</i>	bladder-pod lobelia	Native
82	<i>Lolium multiflorum</i>	Italian rye grass	Non-native
83	<i>Lonicera morrowii</i>	Morrow's honeysuckle	Invasive
84	<i>Lonicera X bella</i>	showy fly honeysuckle	Invasive
85	<i>Luzula multiflora</i>	common wood rush	Native
86	<i>Lythrum salicaria</i>	purple loosestrife	Invasive
87	<i>Maianthemum canadense</i>	Canada-mayflower	Native
88	<i>Maianthemum racemosum</i>	feathery false Solomon's-seal	Native
89	<i>Malus</i> sp.	apple	
90	<i>Matricaria discoidea</i>	rayless chamomile	Non-native
91	<i>Morella caroliniensis</i>	small bayberry	Native
92	<i>Muhlenbergia</i> sp.	muhly	
93	<i>Nuttallanthus canadensis</i>	oldfield-toadflax	Native

Attachment 2. Observed Vascular Plant List

94	<i>Oenothera biennis</i>	common evening-primrose	Native
95	<i>Onoclea sensibilis</i>	sensitive fern	Native
96	<i>Osmunda claytoniana</i>	interrupted fern	Native
97	<i>Oxalis dillenii</i>	slender yellow wood sorrel	Native
98	<i>Panicum philadelphicum</i> var. <i>campestre</i>	Philadelphia panicgrass	Native
99	<i>Parthenocissus quinquefolia</i>	Virginia creeper	Native
100	<i>Phalaris arundinacea</i>	reed canary grass	Invasive
101	<i>Phleum pratense</i>	common Timothy	Non-native
102	<i>Phytolacca americana</i>	American pokeweed	Native
103	<i>Pilea pumila</i>	Canada clearweed	Native
104	<i>Pinus strobus</i>	eastern white pine	Native
105	<i>Plantago lanceolata</i>	English plantain	Non-native
106	<i>Plantago rugelii</i>	Rugel's plantain	Native
107	<i>Poa annua</i>	annual blue grass	Non-native
108	<i>Poa compressa</i>	flat-stemmed blue grass	Invasive
109	<i>Poa nemoralis</i>	wood blue grass	Non-native
110	<i>Poa pratensis</i> ssp. <i>pratensis</i>	Kentucky blue grass	Non-native
111	<i>Polystichum acrostichoides</i>	Christmas fern	Native
112	<i>Populus deltoides</i>	eastern cottonwood	Native
113	<i>Populus grandidentata</i>	bigtooth aspen	Native
114	<i>Populus tremuloides</i>	quaking aspen	Native
115	<i>Potentilla canadensis</i>	dwarf cinquefoil	Native
116	<i>Potentilla recta</i>	sulphur cinquefoil	Non-native
117	<i>Potentilla simplex</i>	common cinquefoil	Native
118	<i>Prunella vulgaris</i>	common selfheal	Native
119	<i>Prunus pensylvanica</i>	pin cherry	Native
120	<i>Prunus serotina</i>	black cherry	Native
121	<i>Pteridium aquilinum</i>	bracken fern	Native
122	<i>Pycnanthemum tenuifolium</i>	narrow-leaved mountain-mint	Native
123	<i>Quercus alba</i>	eastern white oak	Native
124	<i>Quercus prinoides</i>	dwarf chestnut oak	Native
125	<i>Quercus velutina</i>	black oak	Native
126	<i>Ranunculus abortivus</i>	kidney-leaved crowfoot	Native
127	<i>Rhus glabra</i>	smooth sumac	Native
128	<i>Rhus hirta</i>	staghorn sumac	Native
129	<i>Robinia pseudoacacia</i>	black locust	Invasive
130	<i>Rorippa palustris</i>	common yellow-cress	Native
131	<i>Rosa multiflora</i>	multiflora rose	Invasive
132	<i>Rubus allegheniensis</i>	common blackberry	Native
133	<i>Rubus flagellaris</i>	northern blackberry	Native
134	<i>Rubus idaeus</i>	red raspberry	Native
135	<i>Rubus occidentalis</i>	black raspberry	Native
136	<i>Rumex acetosella</i>	common sheep sorrel	Invasive
137	<i>Rumex crispus</i>	curly dock	Non-native
138	<i>Rumex obtusifolius</i>	bitter dock	Non-native
139	<i>Salix alba</i>	white willow	Non-native
140	<i>Salix discolor</i>	pussy willow	Native

Attachment 2. Observed Vascular Plant List

141	<i>Salix nigra</i>	black willow	Native
142	<i>Sambucus nigra</i>	black elderberry	Native
143	<i>Sassafras albidum</i>	sassafras	Native
144	<i>Schedonorus arundinaceus</i>	tall rye grass	Non-native
145	<i>Schizachyrium scoparium</i>	little bluestem	Native
146	<i>Setaria faberi</i>	Chinese foxtail	Non-native
147	<i>Silene antirrhina</i>	sleepy campion	Native
148	<i>Silene dioica</i>	red campion	Non-native
149	<i>Silene latifolia</i>	white campion	Non-native
150	<i>Sisymbrium officinale</i>	common hedge-mustard	Non-native
151	<i>Solanum dulcamara</i>	climbing nightshade	Non-native
152	<i>Solidago canadensis</i>	Canada goldenrod	Native
153	<i>Solidago gigantea</i>	smooth goldenrod	Native
154	<i>Solidago nemoralis</i>	gray goldenrod	Native
155	<i>Solidago rugosa</i>	common wrinkle-leaved goldenrod	Native
156	<i>Solidago juncea</i>	early goldenrod	Native
157	<i>Stellaria media</i>	common starwort	Non-native
158	<i>Swida amomum</i>	silky dogwood	Native
159	<i>Swida racemosa</i>	gray dogwood	Native
160	<i>Symphyotrichum</i> sp.	american-aster	
161	<i>Taraxacum officinale</i>	dandelion	Non-native
162	<i>Taxus</i> sp.	yew	
163	<i>Thuja occidentalis</i>	northern white-cedar	Native
164	<i>Toxicodendron radicans</i>	poison ivy	Native
165	<i>Trifolium arvense</i>	rabbit-foot clover	Non-native
166	<i>Trifolium pratense</i>	red clover	Non-native
167	<i>Trifolium repens</i>	white clover	Non-native
168	<i>Triodanis perfoliata</i>	clasping-leaved Venus'-looking-glass	Native
169	<i>Turritis glabra</i>	tower-mustard	Native
170	<i>Ulmus rubra</i>	slippery elm	Native
171	<i>Urtica dioica</i>	stinging nettle	Native
172	<i>Vaccinium corymbosum</i>	highbush blueberry	Native
173	<i>Verbascum thapsus</i>	common mullein	Non-native
174	<i>Verbena urticifolia</i>	white vervain	Native
175	<i>Veronica arvensis</i>	corn speedwell	Non-native
176	<i>Veronica peregrina</i>	purslane speedwell	Native
177	<i>Viburnum acerifolium</i>	maple-leaved viburnum	Native
178	<i>Viburnum dentatum</i> var. <i>lucidum</i>	smooth arrowwood	Native
179	<i>Vicia cracca</i>	cow vetch	Non-native
180	<i>Vicia tetrasperma</i>	four-seeded vetch	Non-native
181	<i>Viola sororia</i>	woolly blue violet	Native
182	<i>Viola tricolor</i>	garden violet	Non-native
183	<i>Vitis labrusca</i>	fox grape	Native
184	<i>Vitis riparia</i>	river grape	Native

Attachment 3 Biologist Qualifications

Brett Trowbridge

Senior Ecologist



Education

BS, Biotechnology, Worcester Polytechnic Institute, 2002

Affiliations/ Memberships

New England Botanical Club (NEBC) Councillor (2019-present)

New England Botanical Club President (2017-2019)

NEBC Herbarium Volunteer

New England Plant Conservation Program (NEPCoP) Task Force Member

NEPCoP Plant Conservation Volunteer Corps Member

Botanical Club of Cape Cod and the Islands

Torrey Botanical Society

New York Flora Association

Timber Rattlesnake Recovery Group

Massachusetts Association of Conservation Commissioners

Association of Massachusetts Wetland Scientists

Conservation Commissioner Princeton, MA (2014-2017)

Brett is a Senior Ecologist in the Natural Sciences Group in VHB's Worcester, Massachusetts, office. He has a diverse background in environmental services, specializing in botanical inventories, wildlife surveys, habitat assessments, vernal pool ecology, wetland delineation, wetlands and wildlife permitting, mitigation, and construction monitoring. Brett has successfully contributed to numerous local, state, and federal environmental permit applications in the Northeast. He frequently integrates Global Positioning System (GPS) and Global Information System (GIS) technologies into his field work and permitting.

17 years of professional experience

Solar Project (GRE Gacurux LLC), Waterford CT

Brett surveyed for state-listed and federally-listed plants (needlegrass, Small Whorled Pogonia, and Nuttall's Milkwort) and conducted habitat evaluations for Spotted Turtle, Smooth Green Snake, Eastern Box Turtle, and Eastern Ribbon Snake throughout a 150-acre site. He subsequently prepared a rare species survey summary for CT DEEP review.

Putnam Park Marina, Wethersfield, CT

Brett surveyed a 9.4-acre site for state-listed plants (Wiegand's Wild Rye and Northern Arrowhead) and evaluated habitat for state-listed amphibians and fish (Mudpuppy, Northern Leopard Frog, Shortnose Sturgeon, and Atlantic Sturgeon). After the field work was conducted, Brett prepared a state-listed species summary for CT DEEP review and identified rare species protection methods during construction of a new marina along the Connecticut River.

The Ridge at Talcott Mountain, Simsbury, CT

Brett conducted vernal pool evaluations throughout wetlands on a 173-acre site and performed habitat assessments, and surveys for several CT state-listed herpetological (*Ambystoma jeffersonianum*, *Ambystoma laterale*, *Clemmys guttata*, *Heterodon platirhinos*, *Lithobates pipiens*, *Terrapene carolina*, and *Thamnophis sauritus*) and vascular plant species (*Carex davisii*, *Desmodium glabellum*, *Drymocallis arguta*, *Elymus wiegandii*, *Hydrophyllum virginianum*, and *Silene stellata*). He subsequently prepared a Habitat Assessment & Project Description for CT DEEP review and submitted observation records for each observed rare species.

Solar Project (Next ERA), Montville, CT

Brett conducted survey transects throughout a 136-acre site to identify potential vernal pool habitat. Subsequently, he conducted wading surveys within potential vernal pool areas to document conditions and evaluate whether conditions are suitable for breeding by vernal pool species. Brett prepared a vernal pool summary memorandum along with vernal pool data sheets and photographs of two cryptic vernal pools that were identified on the site CT DEEP review.

Solar Project (Well Road intermediate School), Granby, CT

As part of the pre-construction environmental due-diligence and permitting for a photovoltaic development, Brett investigated a 15-acre site for vernal pools. He identified four cryptic vernal pools and prepared a summary report and associated vernal pool data sheets for CT DEEP review.

New England Power Company Transmission Line Reliability Project, Tewksbury, Pelham, Windham, Hudson, Londonderry, NH

For this interstate transmission reliability project, Brett performed due-diligence field work and negotiated approvals to work within state-listed species habitat areas with the NH Fish and Game and the NH Natural Heritage Bureau. His field work entailed pre-construction surveys and habitat evaluations for NH state-listed reptiles (black racer, spotted, wood, and Blanding's turtles) and pre-construction botanical surveys. He subsequently prepared state-listed snake, turtle, and plant protection plans to be implemented during construction. Brett provided environmental monitoring to ensure on-site compliance with permit conditions during ~12 months of construction, including capturing and translocating rare herpetiles away from work zones. He is currently monitoring project work areas to document restoration of rare plant habitat areas.

Substation Upgrades and Transmission Line Reconfiguration, Adams, MA

Brett assisted with permitting under MA Division of Fisheries and Wildlife, MA Department of Environmental Protection, and US Army Corps of Engineers regulations for this transmission reliability project, which included work within rare species habitat and involved temporary and permanent impacts to wetlands and rare species. He performed pre-construction, due-diligence botanical surveys, and prepared a rare plant protection plan and a comprehensive 2-acre wetland rehabilitation plan, which included tree and shrub plantings, mowing, and treatment of invasive plants. Brett provided construction monitoring during site work and wetland rehabilitation. He commenced long-term monitoring of the site during 2019 to document effectiveness of treatments and confirm that site conditions meet wetland rehabilitation goals.

Solar Development, Merrimack, NH

Brett conducted weekly surveys for eastern hognose snake and black racers prior to commencement of construction for a 12-acre, ground-mounted solar array involving tree removal and grading. His field work also included surveys for vascular plants: bird-foot violet and red threeawn. Brett documented snake and rare plant observations throughout the site and prepared report materials for NHF&G.

Granite Bridge Pipeline and Liquefied Natural Gas Facility, Manchester, Auburn, Candia, Raymond, Epping, Brentwood, Exeter, and Stratham, NH

Brett identified areas of suitable turtle nesting along the 27-mile project alignment to be surveyed for state-listed turtle nesting during and in advance of construction. Brett worked with NHF&G to establish an appropriate snake survey protocol and conducted fall and spring snake surveys within areas that were identified as potential habitat for black racers.

Eversource New Right-of-way, Hudson, Stowe, Marlborough, Sudbury, MA

For this ± 7.6-mile-long, new transmission line project, Brett conducted vernal pool evaluations and habitat assessments for MA state-listed whip-poor-will, wood turtle, eastern box turtle, and blue-spotted salamander. Brett prepared Massachusetts Endangered Species Act (MESA) Project Review Checklist for the project review by the MA Division of Fisheries and Wildlife (MA DFW).

Town Well Testing, Maynard, MA

Brett generated a Blanding's turtle protection plan for the Town of Maynard Department of Public Works for groundwater pump testing associated with a potential new Town public water supply well. After receiving approval from the MA DFW to serve

Brett Trowbridge

as the qualified biologist for the project and obtaining a Scientific Collection Permit from the MA DFW, Brett conducted a turtle training session for project workers and conducted turtle surveys throughout the work area immediately prior to the daily construction.

Wellesley College Science Center Renovations, Wellesley, MA

For this three-year, multi-phase renovation and construction project, Brett performed a habitat assessment within the wetland buffer zone on the project site. After field inspection, Brett documented the site conditions and habitat features and made recommendations pertaining to wildlife within a letter to the Wellesley Natural Resources Commission (WNRC). Subsequently, Brett met the WNRC agent at the project site to discuss wildlife considerations for the project.

Eversource Line 312 Structure Replacement, Montague, MA

Brett generated an Eastern Box Turtle protection plan and obtained a Scientific Collection Permit for handling this state-listed species during project construction. Brett also conducted surveys for American Bittersweet for this transmission infrastructure project. Following construction, Brett provided a summary of protection plan activities and submitted rare species observation records to the MA DFW.

Stone Ridge, Milford, MA

This project entailed updating wetlands and wildlife permits for commercial development of an 80-acre property located within wood turtle habitat. Brett prepared permit amendment requests for review by the MA Department of Environmental Protection, the Milford Conservation Commission, and the MA DFW based on updated project design plans. Brett also generated a wood turtle protection plan to be implemented during project construction.

Rumney Salt Marsh Restoration Monitoring, Saugus, MA

DEP Wetland Variance and USACE Section 404/Section 10 Permits for Logan Runway Safety Area projects require post-construction monitoring of a 4.2-acre salt marsh restoration area of Rumney Marsh. Brett implemented the post-construction monitoring protocol, including establishment of monitoring locations, installation of permanent markers, accretion sampling stations, and a tide staff gauge. Brett has conducted 2 years of vegetation, accretion, and hydrology monitoring, and prepared associated memoranda and annual reports. Brett will continue monitoring marsh reestablishment during 2019.

Worcester Airport CAT III ILS & Taxiway Improvements, Worcester, MA

The CAT-III ILS and Taxiway Project at the Worcester Airport resulted in the permanent loss of bordering vegetated wetlands and Massport designed and constructed a 7,320 square foot compensatory wetland. Habitat for grasshopper sparrow was also altered during the project and a Conservation and Management Permit was issued by the MA DFW. During 2018, Brett conducted multiple vegetation monitoring events, preparing interim reports after each, and prepared an annual year end summary report. He will monitor the restored wetland again during fall 2019. During spring 2019, Brett generated a vascular plant species list of the airports grasslands and conducted follow-up monitoring for grasshopper sparrows, with positive findings for this species.