

GOVE ENVIRONMENTAL SERVICES, INC.

Wetlands and Soil Mapping

WILDLIFE HABITAT ASSESSMENT

for a

Commercial Development
Friar's Drive
Hudson, New Hampshire

Lowell Road Property Owner, LLC

April 2021

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526

Ph (603) 778 0644 / Fax (603) 778 0654

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*Wildlife Habitat Assessment for,
Lowell Road Property Owner, LLC,
Friar's Drive, Hudson
April 30, 2021*

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NHB21-3044



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April 30, 2021*

PART 1: SUMMARY AND FINDINGS

Wildlife Biologist: Luke Hurley	NHB21-3044
Gove Environmental Services, Inc.	Commercial Development
8 Continental Drive, Exeter, NH 03833	Friar's Drive, Hudson
lhurley@gesinc.biz	Lowell Road Property Owner, LLC
603-770-5114	AOT Application

PROPOSED PROJECT:

The proposed project is for a 504,000sf building facility, with associated driveways, parking spaces, loading docks and associated drainage.

PHASE I Threatened and Endangered Wildlife and Habitat Assessment Findings:

Check one

No threatened and endangered wildlife and habitat present, no threatened or endangered wildlife, habitat, or wildlife corridors likely to be impacted by project activities.

Threatened and endangered wildlife and habitat present; **HOWEVER, NO** threatened or endangered wildlife, habitat, or wildlife corridors likely to be impacted by project activities.

No conservation measures are proposed.

Threatened and endangered wildlife and habitat present or wildlife corridors present.

Proposed actions have the potential for impacts. Conservation measures incorporated into the proposed project or project design.



THREATENED AND ENDANGERED WILDLIFE AND HABITAT:

NHB21-3044 has checked for records of rare species and exemplary natural communities near the area of the project. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. No recorded occurrences for sensitive species near this project area were identified and none were observed on site during site visitation.

On-site habitat is dominated by mature Appalachian-oak-pine forest and stream side wetlands, which, based upon resources cited in this Assessment, may be habitat for the following species:

Bald eagle, SC, SGCN
Alewife, SC, SGCN
American eel, SC, SGCN
American shad, SC, SGCN
Banded sunfish, SC, SGCN
Bank swallow, SC, SGCN
Brook floater, SE, SGCN
Creeper, SGCN
Eastern pond mussel, ST, SGCN
Redfin pickerel, SC, SGCN
Black-billed cuckoo, SGCN
Chimney swift, SGCN
Eastern box turtle, SE, SGCN
Eastern towhee, SGCN
Eastern hognose snake, SE, SGCN
Eastern whip-poor-will, SGCN
Scarlet tanager, SGCN
American woodcock, SGCN
Big Brown Bat SC, SGCN
Silver-haired bat SC, SGCN
Tri-colored bat SE, SGCN
Eastern red bat SC, SGCN
Hoary bat SGCN
Little brown myotis SE, SGCN
Northern goshawk, SGCN
Purple finch, SGCN
Veery SGCN
Wood thrush SGCN
Wood turtle SC, SGCN
Northern leopard frog, SC, SGCN
Eastern ribbon snake, SGCN
Eastern hognose snake, SE, SGCN
Ruffed grouse SGCN
Spotted turtle, ST, SGCN



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Fowler's toad, ST, SGCN

Northern black racer, ST, SGCN

Ringed boghaunter, ST, SGCN

PROPOSED CONSERVATION MEASURES:

As part of the project, 35-acres will be undeveloped and this will include the area along Fuller Brook, as well as the Merrimack River.

Ideal methods for erosion control around the perimeter of the work areas is mulch berms. These are natural and often readily available for development sites. These are easy to install and do not need to be removed once the project is complete. The use of mulch berms does not act as a barrier to wildlife as they are able to easily walk over the berms with no issues. The use of welded plastic or 'biodegradable plastic' netting or thread in erosion control matting should be avoided. There are numerous documented cases of snakes and other wildlife being trapped and killed in erosion control matting with synthetic netting and thread. The use of erosion control berm, white Filtrexx Degradable Woven Silt Sock, or several 'wildlife friendly' options such as woven organic material (e.g. coco or jute matting such as North American Green SC150BN or equivalent) are readily available.



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PART 1: SUMMARY AND FINDINGS

NHB21-3044
Commercial Development
Friar's Drive, Hudson
Lowell Road Property Owner, LLC
AOT Application

Printed name, date and signature of Individual that conducted the Phase I Threatened and Endangered Wildlife and Habitat Assessment. Note: By signing this document, the qualified wildlife biologist (Env. Wq. 1503.19(h)) is assuming responsibility for the wildlife assessment. Credentials need to be included in Part 4: Appendices.

Luke Hurley
Name – printed

April 30, 2021
Date

Signature

Check Applicable Requested Action

- Request for NHFG Concurrence with Findings in compliance with Env. Wq. 1503.19(h)(1)a
- Request for NHFG Concurrence with Findings and Proposed Conservation Measures in compliance with Env. Wq. 1503.19(h)(1)b*
- Requests further coordination with NHFG to discuss proposed conservation measures and/or, potential focused survey needs (Phase II) *

*New Hampshire Fish and Game's review and recommendations are based on the information provided in this assessment. Changes to project scope may affect NHFG and/or NHDES determination on potential impacts and whether conservation measures and project design modifications proposed are still applicable or sufficient.

Other:



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PART 2: NHB21-3044 Datacheck Results Letter, Figures, Site Photographs

Include in order presented below:

NHB21-3044 Datacheck Results Letter

Aerial Figure

Topographic Figure

NH Wildlife Action Plan - Land Cover Figure

NH Wildlife Action Plan - Habitat Rankings and Conservation Parcels Figure

Conservation Parcels

NRCS Soils

Site photographs with photograph location plan



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NHB21-3044

New Hampshire Natural Heritage Bureau NHB DataCheck Results Letter

To: Luke Hurley
8 Continental Drive
Exeter, NH 03833

From: NH Natural Heritage Bureau

Date: 9/25/2021 (This letter is valid through 9/25/2022)

Re: Review by NH Natural Heritage Bureau of request dated 9/25/2021

Permit Type: Alteration of Terrain Permit

NHB ID: NHB21-3044

Applicant: Luke Hurley

Location: Hudson
Tax Map: 209, Tax Lot: 1
Address: Friar's Drive

Proj. Description: The proposed project is for a warehouse facility, with associated driveways, parking and loading docks. No wetland impacts are proposed.

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

New Hampshire Natural Heritage Bureau
NHB DataCheck Results Letter

MAP OF PROJECT BOUNDARIES FOR: NHB21-3044





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Aerial Photo



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USGS Topo Map

USGS



Legend

- Parcels
 - Parcel Polygons
 - Attributes for Additional Lines
- State
- County
- City/Town

Map Scale
1: 12,988



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Map Generated: 9/25/2021

Notes

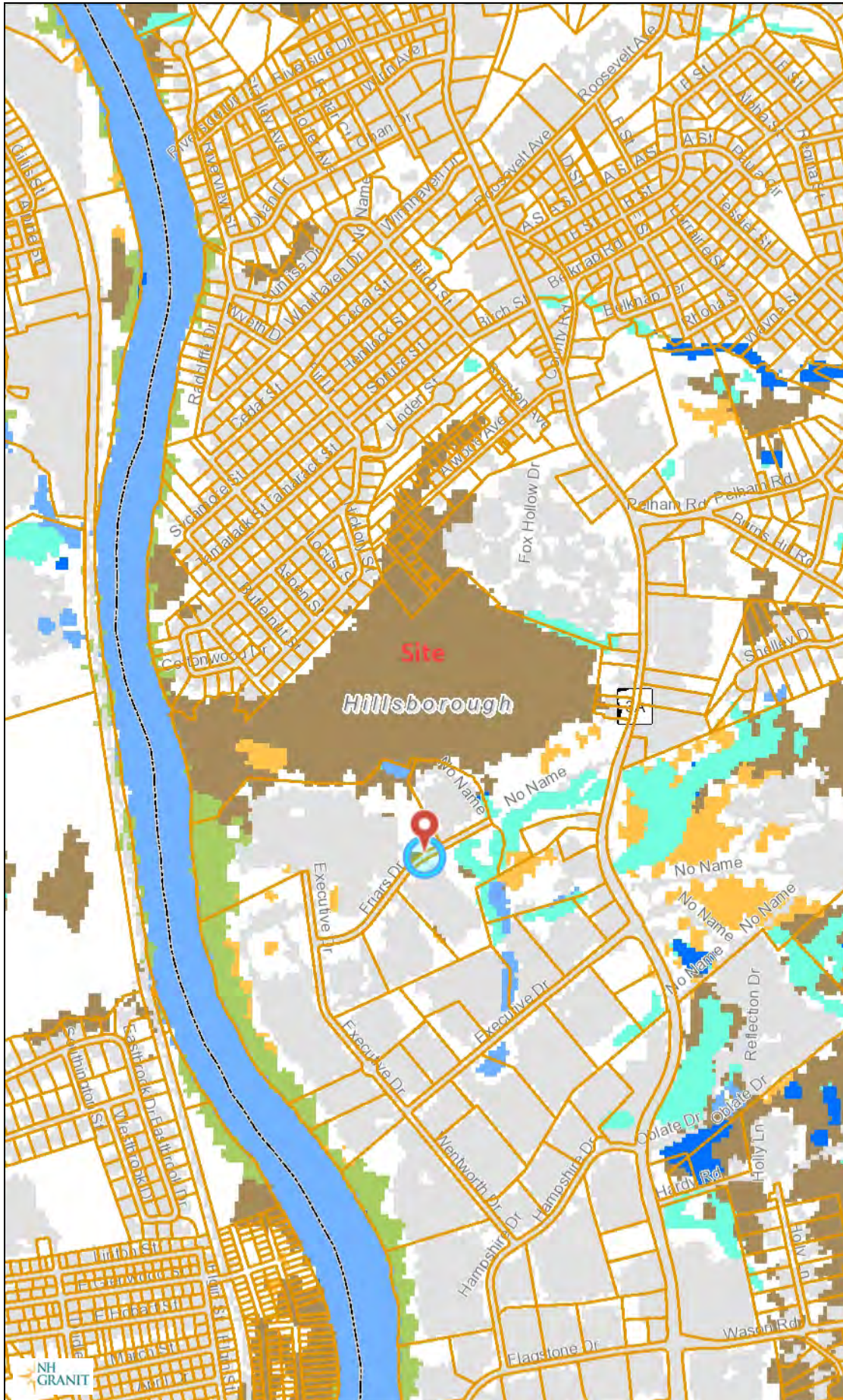




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**NH Wildlife Action Plan
Land Cover Figure**

WAP 2020: Wildlife Habitat Land Cover



Legend

Parcels

- Parcel Polygons
- Attributes for Additional Lines

State

County

City/Town

WAP 2020: Wildlife Habitat I Cover

- Alpine
- Appalachian oak-pine
- Cliff and Talus slope
- Coastal island and Rocky coast
- Developed Impervious
- Developed or Barren land
- Dune
- Floodplain forest
- Grassland
- Hemlock-hardwood-pine
- High-elevation spruce-fir
- Lowland spruce-fir
- Northern hardwood-conifer
- Northern swamp
- Open water
- Peatland
- Pine barren
- Rocky ridge
- Salt marsh
- Sand/Gravel
- Temperate swamp
- Marsh and shrub wetland

Map Scale

1: 12,988

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Notes

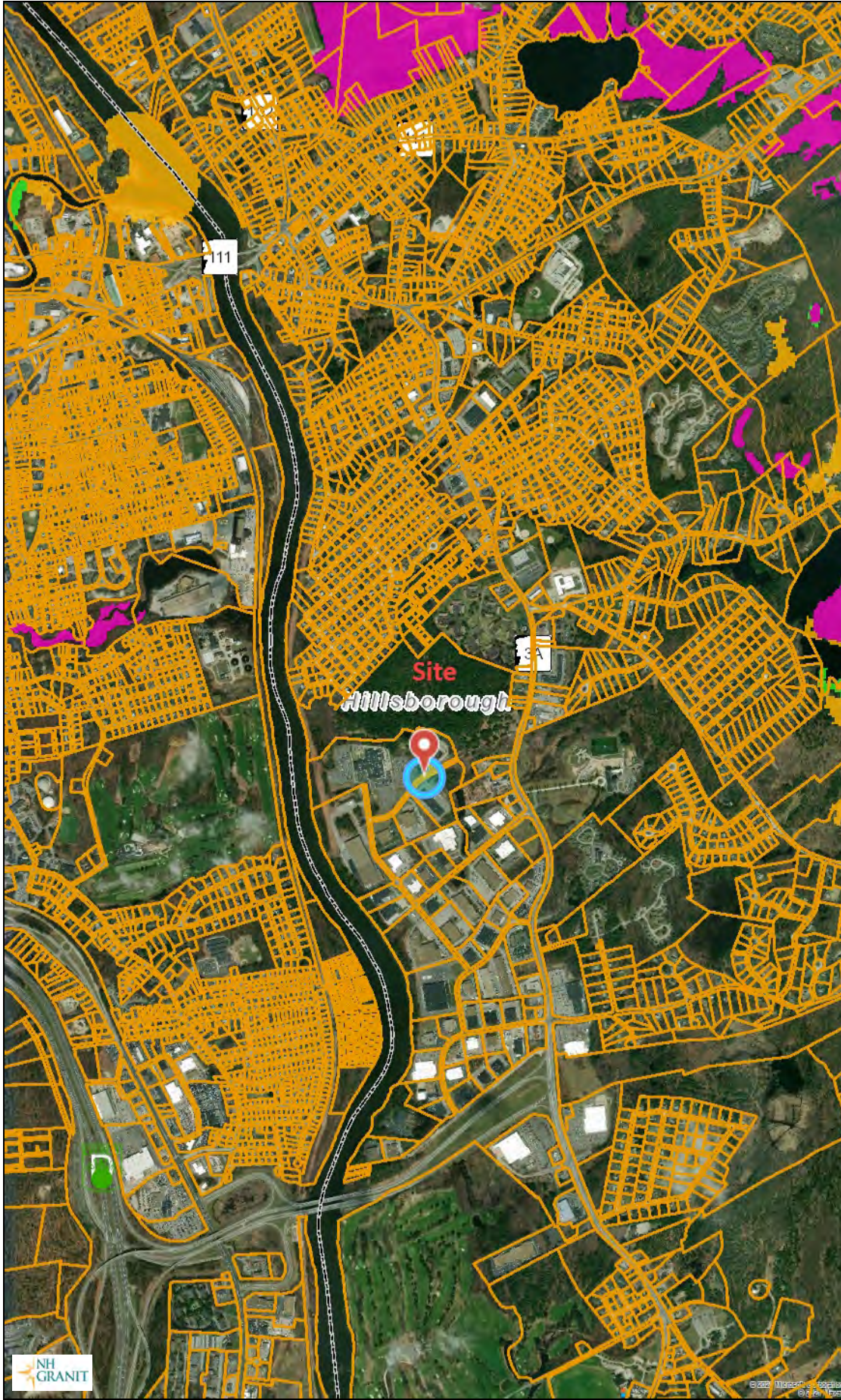




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**NH Wildlife Action Plan
Habitat Rankings**

WAP 2020: Highest Ranked Wildlife Habitat



Legend

- Parcels
 - Parcel Polygons
 - Attributes for Additional Lines
- State
- County
- City/Town
- WAP 2020: Highest Ranked Wildlife Habitat
 - 1 Highest Ranked Habitat in NH
 - 2 Highest Ranked Habitat in Region
 - 3 Supporting Landscape

Map Scale
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Conservation Parcels

Conservation Lands



Legend

- Parcels
 - Parcel Polygons
 - Attributes for Additional Lines
- State
- County
- City/Town
- Conservation and Public Land

Map Scale

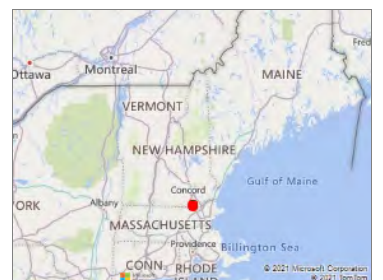
1: 25,977

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Notes





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NRCS Soils

Soil Map—Hillsborough County, New Hampshire, Eastern Part



Map Scale: 1:6,630 if printed on A landscape (11" x 8.5") sheet.

Meters

0 50 100 200 300

Feet

0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Hillsborough County, New Hampshire, Eastern Part

Survey Area Data: Version 22, May 29, 2020

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

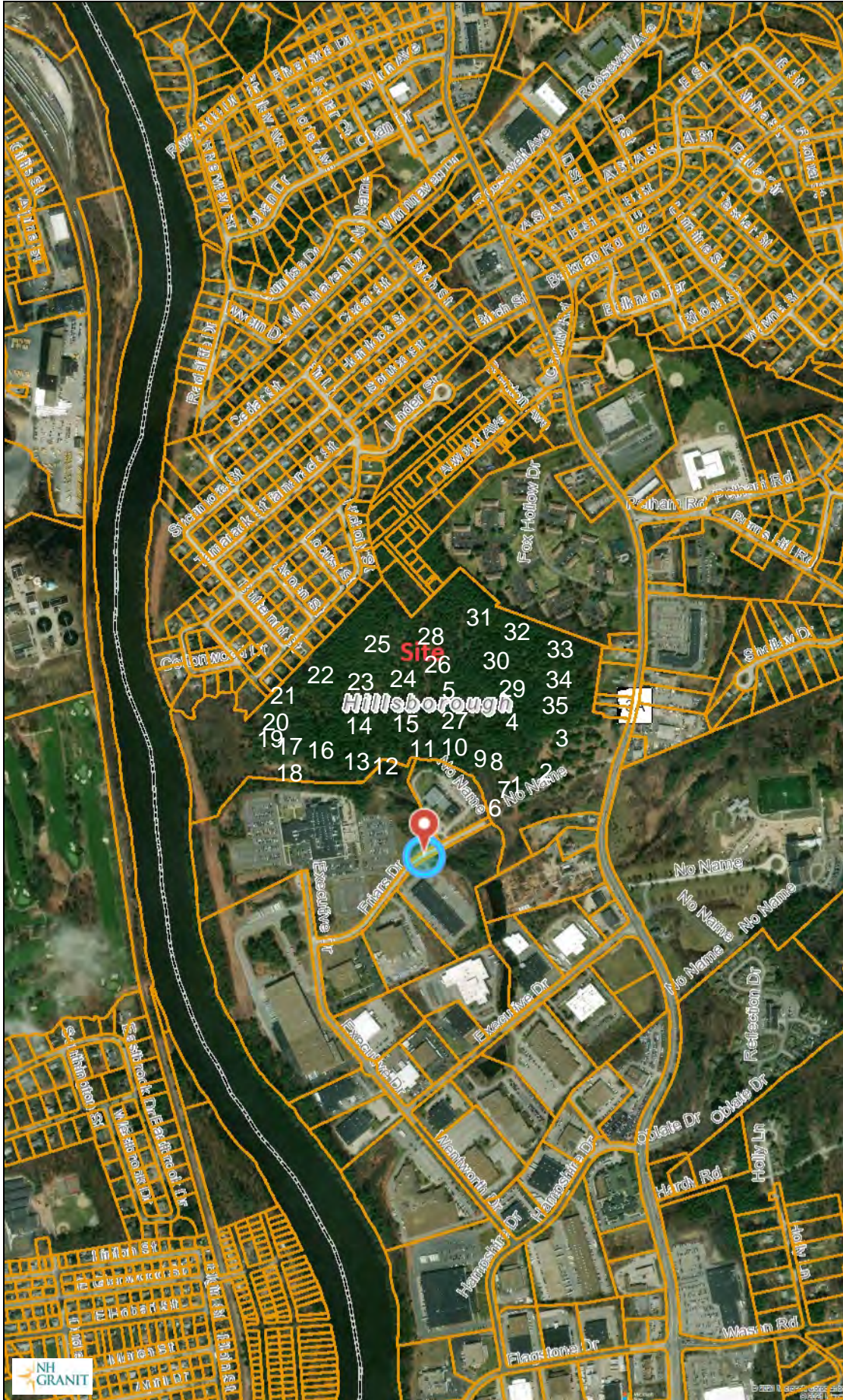
Date(s) aerial images were photographed: May 22, 2015—Jun 14, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HsB	Hinckley loamy sand, 3 to 8 percent slopes	7.0	6.9%
HsC	Hinckley loamy sand, 8 to 15 percent slopes	31.7	31.1%
Om	Occum fine sandy loam, high bottom	3.1	3.1%
PiA	Pipestone loamy sand, 0 to 3 percent slopes	1.3	1.2%
WdA	Windsor loamy sand, 0 to 3 percent slopes	0.7	0.7%
WdB	Windsor loamy sand, 3 to 8 percent slopes	42.0	41.3%
WdC	Windsor loamy sand, 8 to 15 percent slopes	5.8	5.7%
WdD	Windsor loamy sand, 15 to 35 percent slopes	10.2	10.1%
Totals for Area of Interest		101.8	100.0%

Aerial



Legend

- Parcels
 - Parcel Polygons
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Notes





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1. Looking west over edge of recent construction project.



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2. Looking west down Friar's Drive, with site on right.



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3. Looking north over wood trail.



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4. Additional view.



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5. Open area of ATV trails and fire pit.



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6. View looking west over Fuller Brook from Friar's Drive.



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7. Adjacent wetland edge.



8. Adjacent upland.



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9. View over brook further west.



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10. Western view at bridge crossing.



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11. View looking east over old dam.



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12. View over pond at dam.



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13. Western view over brook.



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14. View over adjacent wooded land.



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15. Opposite view.



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16. View along brook bank.



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17. Opposite view looking west.



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18. View down drainage easement looking west.



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19. View looking east up brook.



20. View looking west from drainage easement, downstream.



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21. View of adjacent residential areas on western property line.



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22. Adjacent hillside looking northeast.



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23. Woods trail.



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24. View of central wooded area.



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25. Central wood trail.



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26. Wooded area



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27. Woods trail.



*Wildlife Habitat Assessment for,
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28. View of northern hillside adjacent to homes.



*Wildlife Habitat Assessment for,
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29. Opposite view.



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30. Woods trail.



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31. Hillside along northern adjacent to homes.



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32. Hillside near current development.



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33. Trail with ATV jump.



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34. Wooded area.



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35. Additional wooded view looking east.



PROPOSED PROJECT:

The proposed project is for the construction of a 504,000sf warehouse facility, with associated driveways, loading docks, parking spaces and stormwater treatment area. The site has fully-master planned utilities, sewer, water, gas etc. and access that will be utilized for the development.

PROJECT SITE AND SURROUNDING LAND USE DESCRIPTION:

The site is located on the southwest portion of Hudson. The Merrimack River borders the site to the west, residential neighborhoods to the north west and north east and condominiums to the east and large-scale industrial warehouse facilities immediately to the southwest and south east.

The site is located within the Town of Hudson's Sagamore Industrial Park and is also within the economic revitalization zone program in conjunction with the Nashua Regional Planning Commission and State of New Hampshire.

A sewer main exists thru the southern portion of the property, and a power line along the river.

The parcel is entirely covered with Appalachian-oak-pine forest with Fuller Brook flowing along the southern portion of the site from the east to the west where it empties into the Merrimack River. This is the only wetland system on site.

The site slopes from the north and east sharply to the central area of the site where it is relatively flat. This continues to the brook where the bank along the Merrimack drops sharply.

The site has a relatively open understory, and several trails are present, used by neighboring abutters, as well as ATV use.

The site drainage is collected via a closed drainage system which flows to either open drainage ponds or a subsurface chamber systems. Multiple ponds are proposed, including a series of detention ponds and infiltration ponds. The detention ponds are providing detention for the runoff and then directing and metering flow to proposed treatment swales on site, and proposed infiltration ponds and practices on site. The infiltration ponds and subsurface infiltration systems provide treatment through isolator rows and soil infiltration as well as mitigate peak flows associated with large storm events. Emergency overflows are proposed to ensure the system functions properly during all storm events. Additionally, the site utilizes detention practices (ponds) for portions of the site to detain the runoff, which allows for settling of particles/pollutants, and to meter the flow to the design points. Separate NHDES BMP worksheets are provided for each treatment practice within Section IV. Stormwater Analysis of the report.

FIELD ANALYSIS

The site was visited on April 30, 2021, and potential for TE species and potential habitat, as well as overall site conditions were assessed and documented. The field work was conducted over 6 hours under sunny skies and 65 degrees (F). Field work was performed by slowly walking the



parcel. Resources used: NH Wildlife Action Plan, Wildlife Action Plan – Community Maps (Habitat, Scoring, and SGCN by Town), NHRG Endangered and Threatened Wildlife of NH, Rare Animals, and Exemplary Natural Communities in New Hampshire Towns, Taking Action for Wildlife, NH GRANIT GIS clearinghouse, USDA Web Soil Survey. NH F&G WAP Maps indicate parcel has no level of Highest Ranked Habitat.

Upland Cover Type

Appalachian Oak-White Pine Forest

Field analysis revealed that a semi-mature red oak and white pine community type is the primary upland forested cover type on the property. Red Oak-White Pine-Eastern hemlock forest covers approximately 80% of the project area, outside of the wetlands. The forest canopy of this site is primarily comprised of red oak ranging in size from 6-30" dbh (diameter at breast height). White pine ranging in size from 4-28" dbh is a secondary component of the tree stratum. Occasionally present species include white oak, black cherry, white ash, glossy buckthorn, and gray birch. The sapling stratum is primarily comprised of young red and white oak and white pine. Gray birch is more prominent in this layer and hemlock is present adjacent wetland areas in the western portion of the site. The scrub/shrub layer is minimal in places due to the dense tree canopy, representative species include regenerating oak and white pine, honey suckle, low bush blueberry with partridge berry, tea berry and Canadian mayflower in the herbaceous layer.

Red maple-Shrub-Riverside Swamp

The red maple-shrub-riverside swamp occurs along the banks of Fuller Brook. This is dominated by red maple, yellow birch, highbush blueberry, winterberry, alder, dogwood, and speckled alder in the shrub layer, with cinnamon and sensitive fern, sphagnum moss, swamp dewberry and sedges and grasses. This brook flows along the southern property line of the site.

No vernal pools are on the site.

SOILS AND GEOLOGY

NRCS soil map[s] show this area dominated by Hinckley and Windsor, loamy sands. The lower layers contain some gravel. This material is derived from Outwash and is well to excessively drained. No ESHWT was encountered, nor restrictive layers or ledge.

CONSERVATION LANDS

No conservation lands are in the vicinity of the parcel.

WILDLIFE TRAVEL CORRIDOR

Wildlife corridors exist along Fuller Brook to and from the river, as well as along the river bank. The site is essentially an island and no significant travel from this parcel to another exists, as there is significant urban development surrounding the site.

Any travel along the brook or river is not to be impacted as no work is proposed in these areas.



THREATENED AND ENDANGERED WILDLIFE AND HABITAT EVALUATION:
NHB21-3044 has checked for records of rare species and exemplary natural communities near the area of the project. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. No recorded occurrences for sensitive species near this project area were identified.

Based on the onsite habitat of Appalachian Oak-White Pine Forest and stream side wetland and Merrimack River, the following species may potentially be on site.

Bald eagle, SC, SGCN

Bald eagles breed in forested areas near bodies of water and winter near open water (i.e. coastal areas, rivers, and lakes with open water). No work is proposed along the Merrimack River or Brook. No impacts to this species are expected.

Alewife, SC, SGCN

The alewife is found in lakes, ponds, freshwater rivers, estuaries, and coastal habitats. As no work is being done near the brook or river, no impact is expected.

American eel, SC, SGCN

American eels may be found in almost any freshwater habitat that can be accessed from the ocean, although they reach their largest sizes and abundance in lakes, ponds, and larger rivers. No work is being done near these habitat types. No impact is expected.

American shad, SC, SGCN

American shad spend most of their lives in the ocean, but they migrate upstream in medium to large sized freshwater rivers to spawn in reaches with moderate current. No work is being done near these habitat types. No impact is expected.

Banded sunfish, SC, SGCN

Banded sunfish prefer stands of submerged aquatic vegetation along the margins of lakes, ponds, and slow flowing rivers. They are often found surprisingly far upstream in beaver ponds and small wetlands in the headwater streams of a watershed. These smaller streams may provide refuge from introduced predators like largemouth bass. Banded sunfish are highly tolerant of acidic water, which gives them a competitive advantage in waters with a pH that drops below 4.5. This species would be found within the river. As proposed no impacts or portion of the project is proposed in this location or anywhere in close proximity. No impact to this species is expected.

Bank swallow, SC, SGCN

Bank Swallows breed in exposed vertical banks along rivers, lakes, and oceans, where regular erosion by currents or wave action results in new substrate continually being exposed. They will also use exposed sand or dirt banks created in sand and gravel quarries and road cuts, and even dirt piles at construction sites. The largest colonies in New Hampshire have historically been on dynamic stretches of higherorder rivers such as the Connecticut, Merrimack, and Saco, and their larger tributaries. Some colonies in sand



pits can also get quite large, although their persistence is often limited by ongoing extraction and nearby human activity. Impacts to this species would be from loss of needed habitat along the river where there are ideal nesting banks. No work is proposed in this area and a substantial buffer to the river will remain. No impact is expected.

Brook floater, SE, SGCN

Most commonly in rivers and streams with areas of riffles and coarse-sandy or cobble substrates. Not found in stagnant waters such as lakes and ponds. No work is proposed in or near these habitat areas. No Impact is expected.

Creeper, SGCN

Found in small streams and rivers with sand, cobble, or gravel substrates. This would be mostly in Fuller brook. As no work is proposed in or along the brook, no impact is expected.

Eastern pond mussel, ST, SGCN

Coastal ponds and slow-moving streams and river. Found in a variety of substrates. Similar to the Creeper, no impact is expected.

Redfin pickerel, SC, SGCN

The redfin pickerel prefers shallow weedy backwaters in stands of aquatic vegetation or thick overhanging grasses and shrubs. It is often found in smaller watersheds than the chain pickerel. In New Hampshire it is frequently found in streams flowing through abandoned beaver ponds in very small watersheds that may dry up in some years. No impact is expected to this species.

Black-billed cuckoo, SGCN

Black-billed Cuckoos use a different mix of habitats than most species considered early successional specialists. In addition to shrub- or sapling- dominated habitats (regrowing cuts, rights- of- way, old fields), cuckoos also nest in shrubby wetlands and open woodlands/forest edges with limited early- successional features (e.g., golf courses, woodlots, orchards, and fencerows) (Hughes 2001). Nests are built higher above the ground (1- 2 meters, but as high as 13) than other shrubland species. A portion of the site will remain in the southern area along the brook and the river in the. No impact is expected.

Chimney swift, SGCN

Chimney Swifts once nested in forested areas, building their nests in large hollow trees. By the late 1600s they had adapted to nest in chimneys and became a common feature of urban areas and were nesting almost entirely in chimneys by 1800. Most birds presently occur in the latter, although data are limited from extensively forested landscapes where suitable nesting trees may still be present. Migrants and non- breeding birds also form large communal roosts in chimneys. Some presence of these birds may occur on site, though the site is entirely forested. No impacts are expected.

Eastern box turtle, SE, SGCN



This turtle is found in terrestrial areas such as dry and moist woodlands, old fields, pastures, power-line corridors, and edges of marshes, bogs, and shallow streams. During hot weather, may rest in water or burrow under logs and moist vegetation. Impacts to this species would be from wetland impacts or loss of habitat along the edges of wetlands and streams. No wetland impacts are proposed, and a significant area of open land will remain adjacent to the river and wetlands, with some overland travel. Impacts to this species are not expected.

Eastern towhee, SGCN

These species occur in habitats dominated by shrubs or young trees, sometimes interspersed with mature trees (e.g., pine barrens) or open bare or grassy areas. Typical examples in New Hampshire include regenerating timber harvests, power line rights-of-way, shrubby old fields and edges, and pine barrens. Ample areas of the site are potential habitat for this species with the mixed age forest cover. Impacts would be from the loss of needed habitat. This area is primarily mixed in the Wooded habitat closer to the river and south of the brook. Minimal impact is expected.

Eastern whip-poor-will, SGCN

Eastern Whip- poor- wills inhabit areas of dry soils and open understory, especially in pine and oak woodlands (Cink 2002). They prefer to forage in open areas, such as fields, clearings, regenerating clear cuts, recent burns, and power line rights-of-way (Wilson 2003, Hunt 2013). Dry soil, which contributes to the sparse understory that whip- poor-wills prefer, may also allow for better drainage of the leaf litter where the birds lay their eggs, although definitive data are lacking. In New Hampshire, whip- poor- will records during the Breeding Bird Atlas were all from areas below 1200' elevation (Foss 1994). During a study in the Piscataquog River watershed in 2003, whip- poor- will records were concentrated in the northeastern quarter of the watershed. A preliminary analysis of habitat at points where whip- poor- wills were detected suggests that birds were more likely to occur in areas identified by aerial photography as "dry pine forest," "gravel pit," or "disturbed" (Hunt 2006). Impacts to this species would be from the loss of the open wooded area of the site. Some portion of this will remain along the west and southern areas of the site which may limit impacts to this species.

Scarlet tanager, SGCN

The Scarlet tanager uses a wide range of mature hardwood and mixed forest, especially with oaks. Impacts to this species would be from the loss of habitat through clearing for the project. Some portion of this will remain along the west and southern areas of the site which may limit impacts to this species.

Canada Warbler, SGCN

The Canada Warbler uses a wide range of forest types with well- developed shrub layers, and often wet or even swampy (Reitsma et al. 2010). Examples include red maple/hemlock swamps, regenerating clear cuts, bogs, and dense riparian thickets. No wetland impacts are proposed as part of the project and all wetland buffer as well as considerable adjacent land is to remain unaltered along the brook and along the southern edge of the site. No impacts to this species are proposed.



American woodcock, SGCN

Woodcock require four different habitat types. Clearings are used by males for courtship display. Moist, fertile soils with alder or dense second growth hardwood offer feeding areas. Young, second growth hardwood stands provide nesting and brood rearing habitat. Large fields are needed as night roosting sites. It is important to have all four habitat elements in proximity. With the remaining land along the margins and mostly in the southern area of the site not to be impacted all of these required species will be intact along the margins of the site adjacent to intact forest cover. No impact is expected.

Big Brown Bat SC, SGCN

Silver-haired bat SC, SGCN

Tri-colored bat SE, SGCN

Eastern red bat SC, SGCN

Hoary bat SGCN

Little brown myotis SE, SGCN

Any of the above species of bats could be expected to be present on site based on the mixed age and some mature tree species within the forest canopy. Timing any cutting to the time of year when these species are not on site will minimize impacts. This time of year restriction is dependent on summer roosting months of June 31-August 31 as set by USACE and USF&W.

Purple finch, SGCN

The Purple Finch uses a wide range of forest types, including those of an anthropogenic nature such as orchards, conifer plantations, and suburban yards (Wootton 1996). Densities are probably highest in more northern forest types with significant conifer components. No impacts are expected to this species, as they are common to suburban yards and a portion of the site will remain undisturbed.

Veery SGCN

The veery is most common in moist hardwood forests. Such sites include mid-successional forests, floodplains, swamps, and mature forests with dense shrub layers. These moist wooded areas are present along Fuller Brook and the River. As this area is not to be encroached upon, impacts may be minimized.

Wood thrush SGCN

The wood thrush uses a wide range of hardwood and mixed forests with mesic soils and well-developed shrub and sub canopy layers. Similar to the Veery, the keeping of any work within the southern portion of the site may limit impacts.

Wood turtle SC, SGCN

This turtle is found in slow-moving streams and channels with sandy bottoms. Extensive use of terrestrial habitats during summer, including floodplains, meadows, woodlands, fields, as well as wetlands. No wetland impacts are proposed as part of the project and significant remaining land will be left along the southern edge to minimize impacts.



Northern leopard frog, SC, SGCN

This frog may be found in slow streams, marshes, bogs, or ponds. During summer most often found in wet meadows or fields associated with river floodplains. Impacts to this species would be from the clearing of riparian areas of wetland impacts. None of this is proposed on the site. Additionally there will be significant buffers to the wetlands and over all in the areas potentially used by this species. No impacts are expected.

Eastern ribbon snake, SGCN

This snake is found in and near aquatic habitats such as ponds, swamps, bogs, and stream edges. May be found in wet woodlands but seldom stray far from water. Uses brushy areas on the edges of water for concealment. Similar to the northern leopard frog, no impacts are expected.

Eastern hognose snake, SE, SGCN

This snake requires sandy, gravelly soils such as open fields, river valleys, pine forests, and upland hillsides. Feeds predominately on toads; therefore needs breeding habitat (e.g., wetlands, vernal pools) for amphibians. As the project is designed, most of the work will occur in the central area of the site.

Ruffed grouse SGCN

The Ruffed Grouse uses deciduous and coniferous forests in both upland and wetland settings. Ruffed Grouse are early successional forest specialists. Grouse require four different cover types for drumming, brood rearing, nesting, and wintering. In general, they inhabit brushy, mixed- age woodlands, early successional to mature hardwood and mixed forests, often with aspen and birch as a component. Optimal habitat for Ruffed Grouse includes young (6 to 15- year- old), even- age deciduous stands typically supporting 20- 25,000 woody stems/ha (Gullion 1984). These habitats are available to grouse for approximately one decade because stem densities decrease rapidly through natural thinning as succession proceeds (Dessecker and McAuley 2001). Although commonly identified as an “edge” species, Ruffed Grouse association with habitat edges largely reflects their use of various interspersed forest habitats at different times of the year and their use of marginal habitats where quality habitat is lacking. They typically avoid hard- contrast edges (Dessecker and McAuley 2001). Old orchards are an ideal fall habitat in New England (DeGraaf and Yamasaki 2001). Catkin- bearing trees are also an indicator of grouse habitat. They use logs or stone walls for drumming sites and dense cover for protection (Brooks and Birch 1988). Hens and broods prefer areas with a dense understory and open herbaceous ground cover. Grouse nest and feed in hardwood stands and dust themselves in sunny openings. Ruffed Grouse use mature woodlands, especially coniferous forests, during winter. When snow is deep and soft, birds will roost in the snow. Otherwise they will roost on the ground or in trees. The impacts to this species, which would occur from total clearing are not proposed on this site. The project is keeping a portion of the southern area of the site intact, which may limit impacts.

Spotted turtle, ST, SGCN



This turtle is found in wetlands with shallow, permanent water bodies and emergent vegetation. Marshes, vernal pools, wet meadows, swamps, ponds, and slow-moving streams and rivers all provide suitable habitats for spotted turtles. Terrestrial habitat used extensively while searching for suitable nesting sites, traveling among wetland habitats, and periods of inactivity during high temperatures. No wetlands are proposed for impact and the large open wetland along the south west portion of the is to remain untouched and with a significant buffer. The entire southern portion of the site is to remain uncut and will be kept intact, which will limit any impacts to this species.

Fowler's toad, ST, SGCN

Found in sandy areas such as river valleys, floodplains, lakeshores, and agricultural areas. Also in pine forests, fields, and lawns. Habitat areas used by this species would be along the margins of the site and in areas where no work is proposed. No impact is expected.

Northern black racer, ST, SGCN

Found in a variety of habitats including dry brushy pastures, powerline corridors, rocky ledges, and woodlands. Have large home ranges and require large patches of suitable habitat. The proposed project will have 35-acres of land remaining undisturbed. This should minimize any impacts.

CONSERVATION MEASURES

As part of the project, 35-acres will be undeveloped and this will include the area along Fuller Brook, as well as the Merrimack River.

Erosion Control

Ideal methods for erosion control around the perimeter of the work areas is mulch berms. These are natural and often readily available for development sites. These are easy to install and do not need to be removed once the project is complete. The use of mulch berms does not act as a barrier to wildlife as they are able to easily walk over the berms with no issues. The use of welded plastic or 'biodegradable plastic' netting or thread in erosion control matting should be avoided. There are numerous documented cases of snakes and other wildlife being trapped and killed in erosion control matting with synthetic netting and thread. The use of erosion control berm, white Filtrex Degradable Woven Silt Sock, or several 'wildlife friendly' options such as woven organic material (e.g. coco or jute matting such as North American Green SC150BN or equivalent) are readily available.



*Wildlife Habitat Assessment for
Lowell Road Property Owner, LLC,
Friar's Drive, Hudson, NH
April 30, 2021*

PART 4: Appendices
Resume of qualified wildlife biologist.



LUKE D. HURLEY
CSS, CWS, CESWII,
Vice President

Senior Wetland Scientist, Soil Scientist, Ecologist, and Project Field Coordinator

EXPERIENCE

2001–Present Vice President *Gove Environmental Services, Inc., Exeter, NH*
2000–2001 Environmental/Wetland Scientist, *Acton Survey & Engineering, Acton, MA*
1999–2000 Staff Naturalist, *Massachusetts Audubon Society, Lincoln, MA*
1998–1999 Environmental Inorganic Chemist, *Severn Trent Laboratories, Billerica,*

MA

EDUCATION

B.S. in Environmental Biology, University of Massachusetts, 1996. Concentration in Ornithology, Field Ecology & Biology, Entomology, Invertebrate Zoology, Botany, Wetland Ecology and Limnology.

CERTIFICATIONS

Certified Wetland Scientist, State of New Hampshire (*No 232*)
Certified Soil Scientist, State of New Hampshire (*No. 095*)
Certified Erosion, Sediment, and Storm Water Inspector

PROFESSIONAL SOCIETIES

Association of Massachusetts Wetland Scientists (AMWS)
International Erosion Control Association (IECA)
Massachusetts Association of Conservation Commissions (MACC)
New Hampshire Association of Natural Resource Scientists (NHANRS)

PROFESSIONAL EXPERIENCE SYNOPSIS

Luke Hurley has worked in the field of wetland science and ecology since 1999. As a Senior Wetland and Soil Scientist and Ecologist and Project Manager at GES, he is responsible for over-seeing and implementing all phases of large-scale commercial retail and residential development including preliminary land evaluations, permitting and alternatives analysis under all aspects of local, state and federal regulations. Mr. Hurley is also responsible for coordinating and performing field wetland and soil analyses, delineating wetlands, wetland functions and values and project environmental impact assessments, vernal pool certification, wetland mitigation and restoration design and monitoring, wildlife habitat assessments, threatened and endangered species assessments, inventories and permitting documents. He specializes in permitting under the NH DES Wetlands Bureau and NH DES Shoreland Protection Act, as well as the US Army Corps of Engineers and US Environmental Protection Agency, ME DEP Natural Resource Protection, and Massachusetts Wetlands Protection Act, through Notice's of Intent, as well as additional wetland related permitting through Notice of Resource area Delineations (NRAD) and Abbreviated NRAD (ANRAD), Determination of Applicability and represents clients at hearings with local conservation

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commissions and other state and federal agencies. Mr. Hurley has a Bachelor of Science Degree in Environmental Biology from the University of Massachusetts. He is certified as Wetland Scientist and Soil Scientist by the State of New Hampshire.

PROFESSIONAL SPECIALIZATION

New Hampshire Department of Environmental Services

- Dredge and Fill Applications
- Shoreland Protection Act
- Wildlife Habitat Assessments
- Threatened and Endangered Species Assessments

Massachusetts Wetlands Protection Act (MWPA) & Massachusetts Environmental Policy Act (MEPA) Permitting including:

- NOI (Notice of Intent)
- ANOI (Abbreviated Notice of Intent)
- NRAD (Notice of Resource Area Delineation)
- ANRAD (Abbreviated Notice of Resource Area Delineation)
- RDA (Request of the Determination of Applicability)
- Water Quality Certification
- Ecological Impact Assessments
- Critical Habitat Evaluation in Terrestrial Aquatic Ecosystems; Wildlife Ecology

Massachusetts Endangered Species Act (MESA) Regulations and Massachusetts Natural Heritage & Endangered Species Program including:

- Priority/Estimated Habitat Certification
- Vernal Pool Assessment and Certification
- Rare, Threatened & Endangered Species Inventories
- Natural Communities & Habitat Classification
- Qualified Biologist for Rare, Threatened and Endangered Species Collection

ME DEP Natural Resource Protection

- Ch 305 Permit by Rule
- Ch 310 Wetlands
- Ch 315 Assessing and Mitigating Impacts to Scenic and Aesthetic Uses
- Ch 335 Significant Wildlife Habitat

Wildlife Habitat Assessments and Threatened & Endangered Species Assessments

Threatened and endangered plant transplant projects for State: threatened sweet goldenrod and yellow star grass.

Extensive Wildlife Habitat Assessments, Environmental Impact Assessments and threatened and endangered species assessments, following protocols set forth by UNH Cooperative Extension and EPA EcoBox.

Typical protocols are based on: *Natural Resource Inventories: A Guide for New Hampshire Communities*. Durham, NH: University of New Hampshire Cooperative Extension. This method

is primarily focused on for overall habitat assessment with varying micro habitats to document the existing conditions, as well as directly observed and potential species using that habitat based on desk top analysis and field work.

- 1.0 Introduction; site location, proposed project, existing conditions, and surrounding area land use, i.e. residential, urban, agriculture
- 2.0 Water resources; wetlands, vernal pools, lakes/ponds, rivers/streams, aquifers, etc.
- 3.0 Wildlife and Habitats known and potential species, TE, NHB Habitats
- 4.0 NRCS and Site-Specific Soils
- 5.0 Slopes and Rock Outcrops
- 6.0 Scenic Resources
- 7.0 Historic and Cultural resources, i.e., stone walls, cellar holes, stone foundations, etc.
- 8.0 Conservation lands
- 9.0 Potential threats and conservation measures

Additional protocols are created for individual TE, species, i.e., spotted turtles, Blanding's turtles, wood turtles, hognose snake, black racer, NE Cottontail, woodcock, and vernal pool Assessments. These species-specific assessments focus on individual species and their habitats. These assessments focus on overall habitat, and whether the specific habitat is onsite to support the various needs, for nesting/denning, feeding, and breeding, rearing, and fledging of juveniles. Protocol creation is like the outline through the EPA EcoBox ERA including:

1. Planning and problem formulation
2. Identifying stressors, most often physical through development
3. Identifying receptors of endangered species or critical habitat
4. Identifying potential ecological effects
5. Proposing minimization and/or mitigation of potential impacts

SAMPLE PROJECTS:

2001- Exeter, NH-Wildlife habitat assessment on 62 acres for a proposed commercial retail development. Included documentation of onsite existing conditions of forest habitat cover, existing species occurring on site and potential wildlife species occurring on site. Assessment for TE species was also performed.

2004- Windham, NH-Wildlife habitat assessment on 126 acres for a proposed development. Included documentation of onsite existing conditions of forest habitat cover, existing species occurring on site and potential wildlife species occurring on site. Assessment for TE species was also performed. Specific assessment for Eastern box turtle and Dry- Appalachian Oak-Hickory Forest State of NH Exemplary Community.

2005-Nashua, NH-Wildlife habitat assessment on 50 acres for a proposed commercial retail development. Included documentation of onsite existing conditions of forest habitat cover, existing species occurring on site and potential wildlife species occurring on site. Assessment for TE species was also performed. Specific assessment was done for the bald eagle.

2005-Hooksett, NH-Woodcock habitat assessment and species assessment and management plan for protected land as part of 24.5 acre proposed commercial project.

2006-Pelham, NH-Wildlife habitat assessment on 305 acres as part of a proposed residential subdivision. Documentation was made of existing conditions on site of habitat type and vegetation cover, as well as wildlife species occurring on site and those potentially occurring on site based on habitat type. Specific focus was on the presence of the State listed Blanding's and spotted turtle for occurrence and habitat.

2011-Salem, NH-Wildlife habitat assessment on 70 acres for a proposed residential development. Assessment and assessment were for habitat and cover type, as well as existing and potential wildlife species on site based on the cover type and specific focus was on the swamp white oak flood plain forest and State listed spotted turtle.

2011-Hudson, NH, -Wildlife Habitat and upland community analysis on 290 acres for the presence of dry-Appalachian oak hickory forest and the potential for the State listed New England Cottontail.

2012-North Hampton, NH-Wildlife habitat assessment on 55 acres for a proposed residential development. Assessment and assessment were for habitat and cover type, as well as existing and potential wildlife species on site based on the cover type.

2013-Epping, NH-Wildlife habitat assessment on 198 acres for a proposed development. Focus was on the existing conditions of the site through assessment and documentation of the upland and wetland habitat, as well as existing and potential wildlife species on site.

2013-Newmarket, NH-Wildlife habitat assessment on 105 acres for a proposed development. Focus was on the existing conditions of the site through assessment and documentation of the upland and wetland habitat, and cover type, as well as existing and potential wildlife species on site. Specific attention was paid to the presence of Low-gradient silty-sandy riverbank system and specific species Assessment of State listed Blanding's and spotted turtles.

2014- Newmarket, NH-Wildlife habitat assessment on 25 acres for a proposed development. Focus was on the existing conditions of the site through assessment and documentation of the upland and wetland habitat, and cover type, as well as existing and potential species on site.

2016-Exeter-NH-Wildlife habitat assessment on 62 acres for a proposed development. Focus was on the existing conditions of the site through assessment and documentation of the upland and wetland habitat, and cover type, as well as existing and potential wildlife species on site.

2018-Phillips Exeter Academy, NH-Wildlife habitat assessment on 15 acres for assessment of existing community types and existing and potential wildlife use as part of a management plan and wildlife habitat improvement project.

2018-Alpine habitat survey in Rangeley Maine on a 10 acre portion of alpine land to assess for Bicknell thrush and habitat and specific habitats of Alpine Cliff, Bilberry - Mountain-heath Alpine Snowbank, Cotton-grass - Heath Alpine Bog, Crowberry - Bilberry Summit Bald, Diapensia Alpine Ridge, Dwarf Heath - Graminoid Alpine Ridge, Heath - Lichen Subalpine Slope Bog, Mountain Alder - Bush-honeysuckle Subalpine Meadow, Spruce - Fir - Birch Krummholz

2019- Portsmouth, NH-Wildlife habitat assessment on 66 acres for a proposed development. Focus was on the existing conditions of the site through assessment and documentation of the upland and wetland habitat, and cover type, as well as existing and potential species on site.

2020- York, Maine-Wildlife habitat assessment on 85 acres for a proposed development. Focus was on the existing conditions of the site through assessment and documentation of the upland and wetland habitat, and cover type, as well as existing and potential species on site. Specific assessment was for Blanding's and spotted turtles.

2020-Nottingham, NH-Wildlife habitat assessment 20 acres for a proposed development. Focus was on the existing conditions of the site through assessment and documentation of the upland and wetland habitat, and cover type, as well as existing and potential species on site. Specific assessment was for Blanding's and spotted turtles, Jefferson/Blue Spotted Salamander Complex, and black racer.

SUMMARY OF WILDLIFE ASSESSMENTS:

Mr. Hurley has performed wildlife habitat assessments and threatened and endangered plant Assessments on thousands of acres of land throughout the states of NH, MA, and ME. Additional individual assessments for state listed threatened and endangered plants and habits throughout MA and northern New England. All assessments habitat assessments, or individual plant or animal species were at the request of MA Natural Heritage Program, Vermont Nongame and Natural Heritage Program, New Hampshire Fish and Game and NH Natural Heritage Bureau and various local land use boards as part of the project review and conducted per the above two protocols.