SECTION 10.4

Northern Long-Eared Bat
Phase 1 Bat Habitat Assessment

NORTHERN LONG-EARED BAT

PHASE I BAT HABITAT ASSESSMENT

GRANITE STATE LANDFILL, LLC
DALTON, NEW HAMPSHIRE

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NORTHERN LONG-EARED BAT HABITAT ASSESSMENT

1.0 INTRODUCTION

This report serves to summarize the completion of a Phase 1 Bat Habitat Assessment of an approximate 200 acre area (Figure 1) located within an approximate 1,279.33 acre property (Tax Map 405-33, 406-1, 406-2.1 and 406-3) in the Town of Dalton, New Hampshire. In addition to this area, general observations were conducted along Douglas Drive, an existing gravel road which provides access to the site from Route 116. As planned, Douglas Drive is proposed to be upgraded as part of the project.

The approximate 200 acre "site" is proposed to be developed as a regional landfill facility known as Granite State Landfill, LLC. In addition to the landfill and containment berm, the facility will require infrastructure such as offices, maintenance building, scales, leachate collection system, perimeter access road and other associated improvements.

2.0 PURPOSE

The purpose of this assessment centers on evaluating and characterizing the presence of potential northern long-eared bat (*Myotis septenrionalis)* habitat within the site. The work was performed by Certified Wildlife Biologist, Barry Keith, during the fall of 2019 and spring of 2020. This study shall be used, in part, to satisfy state and federal permitting associated with the proposed project.

The U.S. Fish and Wildlife Service (USFWS) listed the northern long-eared bat as a Federally Threatened specie under the Endangered Species Act. Final 4(d) rule mandated tree cutting/clearing restrictions for projects requiring tree clearing located in the vicinity of known summer habitat for the bat. Under the rule, proposed tree cutting is generally restricted within 150 feet of a known maternity roost tree from June 1 to July 31st, of a given year, and within 0.25 miles of a known hibernaculum at any time of year.

Known maternity roost trees and forested areas within 150 feet of the roost tree are protected during the above referenced period in order to protect juvenile bats that are too young to fly.

Forested areas within 0.25 miles of a known hibernaculum are protected as significant habitat since the bats tend to congregate in these areas during the fall and spring.

This assessment focused on evaluating the existing forested habitat within the site. It is intended to identify any potential long eared-bat habitat within the project area that may be subject to the above referenced tree clearing time restrictions. This study did not conduct acoustic assessments or mist netting surveys to determine the presence or absence of this specie.

3.0 BACKGROUND

The northern long-eared bat utilize large live trees, typically with loose bark, and dead snags as summer maternity roost trees. The bats use various forested land cover types during the spring, summer and fall. During the winter, this specie seeks out caves or abandoned mines as a hibernaculum, or winter hibernation site.

Factors that influence habitat quality include the size or maturity of the forest, the nature and extent of suitable roost trees and unfragmented forest cover. Preferred habitat has been typically found to consist of large contiguous forested areas with limited open areas such as fields, large cleared areas and clear cuts.

4.0 METHODOLOGY

The habitat assessment was conducted in accordance with the USFWS "2020 Range-Wide Indiana Bat Survey Guidelines" which is the method currently has been required by USFWS for northern-long eared bat surveys in New Hampshire.

Phase 1 Habitat Assessment data sheets (Appendix A) were used to document existing dominant vegetative site conditions within the principal existing habitat types found within the proposed project area (Figure 2). The approximate location of data plots are depicted on (Figure 3) the Aerial Photo Map. Using a 10X factor prism, data plots determined tree species, tree diameter at breast height (DBH), closure/density, dominant species of mature trees, percentage of exfoliating bark, size composition of live trees, and number of suitable snags within the representative areas from plot center. The forest types were classified using the report entitled "Natural Communities of New Hampshire" (Sperduto & Nichols, 2011). A photo log of the respective data plot is found in Appendix B.

5.0 OBSERVATIONS

As previously mentioned, the project area encompasses (Figure 2) approximately 200 acres. Approximately 200+ acres of proposed tree cutting is planned, primarily within the proposed footprint for the landfill, perimeter access road, and stormwater management features. The proposed infrastructure area is largely within an existing disturbed site adjacent to an existing rock quarry and existing asphalt plant. The proposed maintenance garage is to be sited within a former sand and gravel mining site. The improvements to Douglas Drive will require limited tree cutting. These improvements center largely on road widening and the installation of proper stormwater management features.

Figure 3 depicts existing land use and principal forest cover types. In general, the dominant forest communities include: lowland spruce-fir, northern hardwood-spruce/fir, sugar maple-

beech-yellow birch forest types. The wooded wetland areas are largely northern conifer and hardwood swamps.

The dominant tree species within the lowland spruce areas are red spruce (*Picea rubens)* and balsam fir *(Abies balsalmea).* Other tree species include red maple (*Acer rubrum)*, white birch *(Betual papyriferia)*, and yellow birch *(Betula alleghaniensis).*

The northern hardwood-spruce-fir forest is a transitional forest type often positioned between spruce-fir forests and the northern hardwood forest type. In addition to those species found within the spruce-fir forest, other hardwood species such as American Beech *(Fagus grandifolia)*, and sugar maple *(Acer saccharum)* are dominant. Nearly no Eastern hemlock *(Tsuga canadensis)* is found within this forest cover type. An occasional white pine *(Pinus strobus)* was periodically observed. Generally, spruce and fir are more dominant in the lower elevations while northern hardwoods become dominant with increased elevation.

As previously stated, the northern hardwood forest is the primary forest type in the higher elevations within the site. Other hardwoods which are found within this forest type include quaking aspen *(Populus tremuloides),* white ash *(Fraxinus Americana)*, striped maple *(Acer pensylvanicum)*, and black cherry *(Prunus serotina).* Red oak *(Quercus rubra)* is occasionally found within this forest type.

The balance of the forested area consists of forested wetlands. These northern conifer and hardwood swamps are generally thickly vegetated areas with a variable mix of conifers and hardwood species. Pockets of scrub-shrub wetland is often interspersed within the forested areas. Common species typically include red maple, yellow birch, red spruce, balsam fir, black ash *(Fraxinus nigra),* and Tamarack *(Larix laricina).* The most common shrubs are winterberry *(Ilex verticillata)* and speckled alder *(Alnus rugosa).*

The lower elevations within the site are west of Douglas Drive while the higher elevations are positioned east of Douglas Drive. The lower areas contain more softwoods and mixed transitional forest cover. The base of the higher elevations are largely vegetated with transitional northern hardwood-spruce-fir forest. The northeast portion of the site consists of northern hardwood forest.

Historically, this property has been a working forest for many years. The Diamond Match Company managed the property as commercial forest land prior to the ownership by Rancourt Associates, a land speculation company. Rancourt sold the property to J.W. Chipping, the current owner of record.

J.W. Chipping has heavily logged the property over a period of time. In addition, portions of the property have been mined for sand and gravel. An existing rock quarry and asphalt plant are positioned immediately south of the proposed landfill foot area.

Given the intensive and on-going logging operations, the forestland within the site is best characterized as "early successional." Young pole-sized trees dominate the size-class. Tree diameters (DBH) largely fall between 3 to 5 inches. The mean tree diameter was estimated to be 3.75 inches. Other areas that were recently clearcut are reverting to hardwood sapling growth, dominated by quaking aspen. The majority of the larger diameter trees have been harvested. Occasional remnant trees are found throughout the respective stands. See Figure 3.

6.0 SUMMARY

USFWS guidelines define potentially suitable northern long-eared bat (NLEB) summer habitat as habitat that "*consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pasture. This includes forest and woodlots containing potential roost (ie., live trees and/or snags greater than 3"dbh that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded corridors may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat."*

In summary, the overall lack of larger diameter trees, the extent of smaller diameter smoothed bark forest and proximity to large open areas (eg. gravel mining and clearcuts) likely do not provide potentially suitable northern long-eared bat habitat.

The USFWS (Appendix C) was consulted (Consultation Code: 05E1NE00-2020-SLI-2571) and found that "there are not critical habitats within your project area under this office's jurisdiction."

Pursuant to Final 4(d) rule effective February 16, 2016, the Site is not within 0.25 miles from any known hibernacula or within 150 feet from any known roost trees. Therefore, the Project is not subject to site tree clearing restrictions.

APPENDIX A: PHASE 1 HABITAT ASSESSMENTS

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Granite State Landfill Date: 5/14/2020

Township/Range/Section: Dalton, NH

Lat Long/UTM/ Zone: N44° 21' W71° 41'38" Surveyor: B. Keith, CWB,CWS,PWS

Brief Project Description

New Regional landfill.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	200+-	80%	20%

	Completely cleared	Partially cleared (will leave trees)	Preserve acres no clearing
Proposed Tree Removal (ac)	X		

Vegetation Cover Types

Pre-Project	Post-Project
Early successional - spruce/fir-N. forest Hdwd	Open grassland Open facility areas

Landscape within 5 mile radius

Flight corridors to other forested areas?

largely forested

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

forestland, S&G mining, clearcuts, asphalt plant, log yard, and powerplant.

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

Less than 0.25 miles (Forest Lake State Park).

APPENDIX A: PHASE 1 HABITAT ASSESSMENTS

Use additional sheets to assess discrete habitat types at multiple sites in a project area
Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area
A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description

Sample Site No.(s): A

juncture of woods roads-West of Douglas Drive

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: VP-1 & VP-2 (see VP Assessments
Pools/Ponds (# and size) X		Open and accessible to bats?		
Wetlands (approx. ac.) X	Permanent X	Seasonal	See Plans	

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	3	3	4	
Dominant Species of Mature Trees	Balsam Fir & Spruce			
% Trees w/ Exfoliating Bark	1	1	1	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	6	1	0	
No. of Suitable Snags	0	0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? No

Additional Comments:

Dense hardwood-softwoods with pole-sized trees dominant. Mean DBH=5.14".

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

APPENDIX A: PHASE 1 HABITAT ASSESSMENTS

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Sample Site Description

Sample Site No.(s): B

Lowland spruce-fir forest

Water Resources at Sample Site

Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: Beaver ponds out of project area.
Pools/Ponds (# and size)	X	Open and accessible to bats? Y		
Wetlands (approx. ac.) X	Permanent	Seasonal	see plans	

Forest Resources at Sample Site

Closure/Density	Canopy (> 50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	1	2	6	
Dominant Species of Mature Trees	None			
% Trees w/ Exfoliating Bark	1	1	1	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	6	1	1	
No. of Suitable Snags	0	0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? No

Additional Comments:

Majority of plot dominated by balsalm fir less than 20' in height. Mean stand diameter (DBH)= 3.0".

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

APPENDIX A: PHASE 1 HABITAT ASSESSMENTS

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Sample Site Description

Sample Site No.(s): C

Northern hardwoods off woods road east of Douglas Drive.

Water Resources at Sample Site

Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
				See VP-3 (Vernal Pool Assessment)
Pools/Ponds (# and size) 400 sf		Open and accessible to bats? Y		
Wetlands (approx. ac.) X	Permanent	Seasonal	see plans	

Forest Resources at Sample Site

	Canopy (> 50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
Closure/Density	1	5	1	
Dominant Species of Mature Trees	No mature trees.			
% Trees w/ Exfoliating Bark	1	1	1	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	6	0	0	
No. of Suitable Snags	0	0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? No

Additional Comments:

Dense stand of even-aged pole-sized northern hardwoods.

Mean tree DBH= 3.47".

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

Use additional sheets to assess discrete habitat types at multiple sites in a project area
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Sample Site Description

Sample Site No.(s): D

Forested wetland west of Douglas Drive.

Water Resources at Sample Site

Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
Pools/Ponds (# and size)		Open and accessible to bats? N		Poorly drained PSS/FO1E
Wetlands (approx. ac.) x	Permanent	Seasonal	see plans	

Forest Resources at Sample Site

Closure/Density	Canopy (> 50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	1	4	3	
Dominant Species of Mature Trees	No mature trees.			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	5	1	0	
No. of Suitable Snags	0	0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? No

Additional Comments:

Plot is west of Douglas Drive.

Dominant species are sapling and pole-sized red maple, gray birch, and yellow birch. Mean tree DBH=3.5".

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

Use additional sheets to assess discrete habitat types at multiple sites in a project area
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Sample Site Description

Sample Site No.(s): E

North of MW off of woods road - East of Douglas Drive

Water Resources at Sample Site

Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: small intermittent stream
		x		
Pools/Ponds (# and size)		Open and accessible to bats? y		
Wetlands (approx. ac.)	Permanent	Seasonal	see plans	

Forest Resources at Sample Site

	Canopy (> 50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
Closure/Density	1	5	2	
Dominant Species of Mature Trees	No mature trees except 1 red oak.			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	6	1	0*	
No. of Suitable Snags	0	0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? No

Additional Comments:

Pole-sized northern hardwood stand dominated by quaking aspen.

* Note: One (1) large diameter (24"+ tree is at the edge of the woods road. Mean tree DBH= 3.65".

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources