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# NEON Site Level Plot Summary

## Bartlett Experimental Forest (BART)

### Document Information

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### Site Background

The Bartlett Experimental Forest (BART) site is near Bartlett, New Hampshire. The site is in Major Land Resource Area (MLRA) 143 – Northeastern Mountains. The entire site consists of 5789 acres and is located in the White Mountains.

### Site Information

Elevation ranges from approximately 207 meters to about 915 meters above sea level.

The parent materials at the BART site are mostly ablation till, lodgment till, melt-out till, and supraglacial till derived from granite and gneiss.

The site is entirely forest land. For 75 years it has been used for research to answer questions about ecological structure, function, and process in New England's northern hardwood forests and to provide guidelines for managing timber and wildlife habitat.

Plant communities include areas of old-growth northern hardwoods with American beech, yellow birch, sugar maple, and eastern hemlock the dominant species. Even-aged stands of red maple, paper birch, and aspen occupy sites that were once cleared. Red spruce stands cover the highest slopes, and eastern white pine is confined to the lowest elevations.

Major soil series on the site, as sampled, include Marlow, Monadnock, and Danforth. Landforms that these soils occur on are back slopes of mountains.

### Analysis of Plots for Sampling

Soil map unit, geology, landform, and major vegetative communities were four features identified for each plot during the pre-analysis. Each unique combination of these four features

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was labeled as a landform setting. The landforms identified on the BART site were mountains. Soil mapping consisted of 48 different map units, and the pre-selected sampling plots occurred in 18 of the map units. The analysis resulted in 15 plots being selected for field description, field sampling, and lab characterization. The 19 plots not sampled either occurred in non-typical settings or were duplicates of one of the 15 chosen plots.

Roughly 43 percent of the Bartlett Experimental Forest (75% of the site's total map units) consisted of map units that were not sampled. The following list of map units had a pre-selected plot that did not get sampled. There are numerous other map units that occur within the Bartlett Experimental Forest and were not sampled and are not included in this list.

Map unit Symbol	Map Unit Name	% Total Site Area
143D	Monadnock fine sandy loam, 15 to 25 percent slopes, very stony	4.2
73C	Berkshire fine sandy loam, 8 to 15 percent slopes, very stony	1.4
379B	Dixfield sandy loam, 3 to 8 percent slopes, very stony	1.3
73D	Berkshire fine sandy loam, 15 to 25 percent slopes, very stony	1.2
169E	Sunapee fine sandy loam, 25 to 35 percent slopes, very stony	0.9
73B	Berkshire fine sandy loam, 3 to 8 percent slopes, very stony	0.8
379D	Dixfield sandy loam, 15 to 25 percent slopes, very stony	0.7
	<b>Total</b>	<b>10.5</b>

Sampled map units represent approximately 57 percent of the total acreage of the Bartlett Experimental Forest (25% of the site's total map units):

Map unit Symbol	Map Unit Name	% Total Site Area
61E	Tunbridge-Lyman-Rock outcrop complex, 25 to 35 percent slopes	14.7
73E	Berkshire fine sandy loam, 25 to 35 percent slopes, very stony	5.4
77E	Marlow fine sandy loam, 25 to 35 percent slopes, very stony	9.8
143B	Monadnock fine sandy loam, 3 to 8 percent slopes, very stony	1.4
143C	Monadnock fine sandy loam, 8 to 15 percent slopes, very stony	5.7
143E	Monadnock fine sandy loam, 25 to 35 percent slopes, very stony	5.7
143F	Monadnock fine sandy loam, 35 to 60 percent slopes, very stony	0.4
169B	Sunapee fine sandy loam, 3 to 8 percent slopes, very stony	3.7
169C	Sunapee fine sandy loam, 8 to 15 percent slopes, very stony	1.8
169D	Sunapee fine sandy loam, 15 to 25 percent slopes, very stony	0.6
282E	Bangor silt loam, 25 to 35 percent slopes, very stony	6.9
647B	Pillsbury gravelly sandy loam, 3 to 8 percent slopes, very stony	1.3



	<b>Total</b>	<b>55.6</b>
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The selected sample plots are representative of the map units in which they occur. Most fall within the Range in Characteristics (RIC) of the individual major component or a similar soil with the exception of the outliers (noted below).

## Plot Findings

The 15 pedons sampled represent 12 soil map units. The major components of these map units are Bangor, Berkshire, Marlow, Monadnock, Pillsbury, Sunapee, and Tunbridge-Lyman-Rock outcrop. All of the plots sampled were forested.

Parent material – Plots BART\_012, 019, 027, 030, and 062 consist of soil formed in ablation till, Plots BART\_004, 010, 013, 015, and 018 formed in lodgment till. Plot BART\_011 formed in ablation till over lodgment till. Plot BART\_081 formed in melt-out till, plot BART\_005 formed in outwash, and plots BART\_023 and 024 formed in supraglacial till. Sampled plots were 33% ablation till, 33% lodgment till, 13% supraglacial till, and 7% each of ablation till over lodgment till, melt-out till, and outwash.

## Summary of Soils

Soils sampled under forest cover generally had organic horizons that were thick. These horizons ranged from 3 to 30 cm in thickness. Only two were less than 9 cm thick and five were 20 cm thick or thicker.

Of the 15 samples, Marlow was the soil series identified the most. Two map unit delineations of Marlow fine sandy loam, 25 to 35 percent slopes, very stony were sampled. One sample classified as Marlow (BART\_004) and the other sample classified as a Marlow taxadjunct (BART\_010) because it contained more gravel and cobbles than the Marlow series allows.

The other two Marlow samples (BART\_013, 015) fell within Sunapee fine sandy loam, very stony map unit delineations. Marlow differs from Sunapee in that it is well drained and is moderately deep to a dense substratum, while Sunapee is moderately well drained and has no dense substratum. Marlow soils form lodgment till, while Sunapee soils form in ablation till. Both are very deep to bedrock.

Four Monadnock map units were sampled. The Monadnock sampled from the Monadnock fine sandy loam, 3 to 8 percent slopes, very stony map unit (BART\_019) classified within the range of the Monadnock series. The Monadnock sampled from the Monadnock fine sandy loam, 25 to 35 percent slopes, very stony map unit (BART\_062) could not be verified as Monadnock because the NEON sampling guidelines limited pit depth to 1 meter and the entire particle size control section in this case could not be observed. This pedon could be Monadnock or Berkshire.

The soil sampled from the Monadnock fine sandy loam, 35 to 60 percent slopes, very stony map unit (BART\_030) was identified as a Danforth taxadjunct that is similar to the Monadnock series but has too many coarse fragments in the solum. The Monadnock sampled from the Monadnock fine sandy loam, 8 to 15 percent slopes, very stony map unit (BART\_011) could not be



correlated to any soil series and appeared to be ablation till over lodgment till. The 2Cd horizon was not sampled because it was below 100 cm.

One of the plots (BART\_018) fell within a Sunapee fine sandy loam, 3 to 8 percent slopes, very stony map unit delineation, but the soil identified was Wilmington. Wilmington differs from Sunapee in that it is poorly drained and is shallow to a dense substratum, while Sunapee is moderately well drained and has no dense substratum. Wilmington soils form lodgment till, while Sunapee soils form in ablation till. Both are very deep to bedrock.

Two of the plots fell within Tunbridge-Lyman-Rock outcrop complex, 25 to 35 percent slopes map unit delineations. One of these samples (BART\_024) was identified as Knob Lock. The Knob Lock series consists of very shallow and shallow, well drained through excessively drained organic soils and is found on similar bedrock controlled landforms as Lyman soils. The Lyman series consists of mineral soils that are shallow to bedrock and somewhat excessively drained.

The other sample from a Tunbridge-Lyman-Rock outcrop complex, 25 to 35 percent slopes map unit (BART\_081) was identified as an Adirondack taxadjunct. The Adirondack Series consists of very deep, somewhat poorly drained, loamy soils overlying dense till. In this sample, the dense substratum was below 100 cm and was not sampled. Tunbridge soil, the deepest major component in this map unit, is well drained and moderately deep to bedrock.

Two of the plots fell within Bangor silt loam, 25 to 35 percent slopes, very stony map unit delineations. One of these samples (BART\_027) was identified as Danforth. Bangor and Danforth soils are both very deep, well drained till soils. Bangor soils have silt content of more than 40 percent in the solum. Danforth soils have a weighted average of more than 35 percent rock fragments in the particle size control section while the Bangor series has less than 35 percent. The other sample from a Bangor silt loam, 25 to 35 percent slopes, very stony map unit (BART\_023) was identified as Rawsonville. Rawsonville soils are moderately deep to bedrock and well drained.

One plot (BART\_012) was located in a Berkshire fine sandy loam, 25 to 35 percent slopes, very stony map unit, but was identified as a Danforth taxadjunct soil. Berkshire and Danforth soils are both very deep, well drained till soils. Danforth soils have a weighted average of more than 35 percent rock fragments in the particle size control section while the Berkshire series has less than 35 percent.

One plot (BART\_005) was located in a Pillsbury gravelly sandy loam, 3 to 8 percent slopes, very stony map unit. This sample pedon could not be correlated to a soil series. This soil is poorly drained as is Pillsbury, but Pillsbury soils form in lodgment till and the sampled soil formed in outwash. Pillsbury soils are moderately deep to a dense substratum while the sampled soil had loose, very gravelly coarse sand for its substratum. There were also no surface stones or boulders.

