Report: Les Mehrhoff Botanical Research Award 2019

Bryophyte and Macrolichen Survey of the MCLA forest and
Creating the Massachusetts College of Liberal Arts Herbarium

By Paige Howard, class of 2020, Massachusetts College of Liberal Arts
and
Dr. Eric T. Doucette, Assistant Professor of Biology
Massachusetts College of Liberal Arts

Overview:

Massachusetts College of Liberal Arts (MCLA) historically had a small herbarium (Index Herbariorum code NASC), from the time when the college was known as North Adams State College. In the last decade, at the time of the construction of a new science building, which coincided with the retirement of the sole botany faculty member, the herbarium was disbanded. The vast majority of the specimens were donated to the UMass Amherst herbarium (Index Herbariorum code MASS), with MCLA retaining just two herbarium cases and an assortment of specimens used for teaching. As part of student-centered research at MCLA we began rebuilding the herbarium and have applied for membership in the Consortium of Northeastern Herbaria.

In the fall of 2019 we began a floristic survey of the bryophytes and macrolichens of the MCLA forest in North Adams, MA (**Figure 1**); an effort that is a stand-alone research project and will also serve to support reinstitution of the MCLA herbarium.
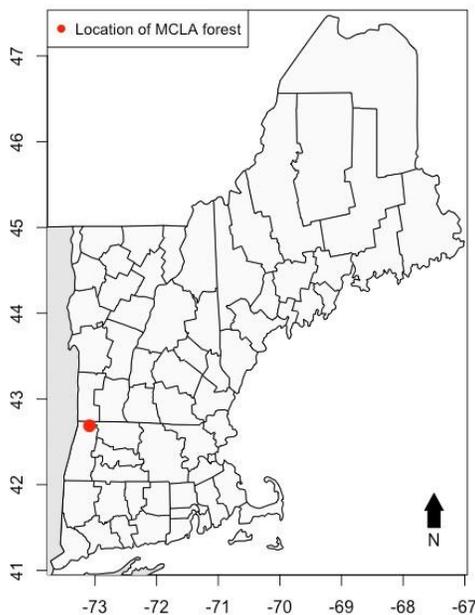

Figure 1: Geographic location of the MCLA forest. *Map generated with R statistical software.*

This property is a 60-acre mature second growth mixed forest, that in addition to the matrix habitat, includes pondshore, woodland seep, forested wetland, seasonal stream, and vernal pool habitats. To date, there has never been a complete floristic survey of this property for any plant or fungal taxa. Paige Howard began a three-semester survey of the property (May 2020 completion date), and in addition to her collecting efforts, she will be curating the specimens and specimen data of other current and future research students. This collection will add to the knowledge of bryophyte and macrolichen distribution in the Berkshires and serve as a thorough baseline data set that can be used for future comparative studies of both natural and anthropogenically-mediated floristic change.

Methods:

We established 34 permanent vegetation sampling plots in the MCLA forest, with 13 on the north side of the central bisecting access road (**Figure 2**), and 21 on the south (**Figure 3**).
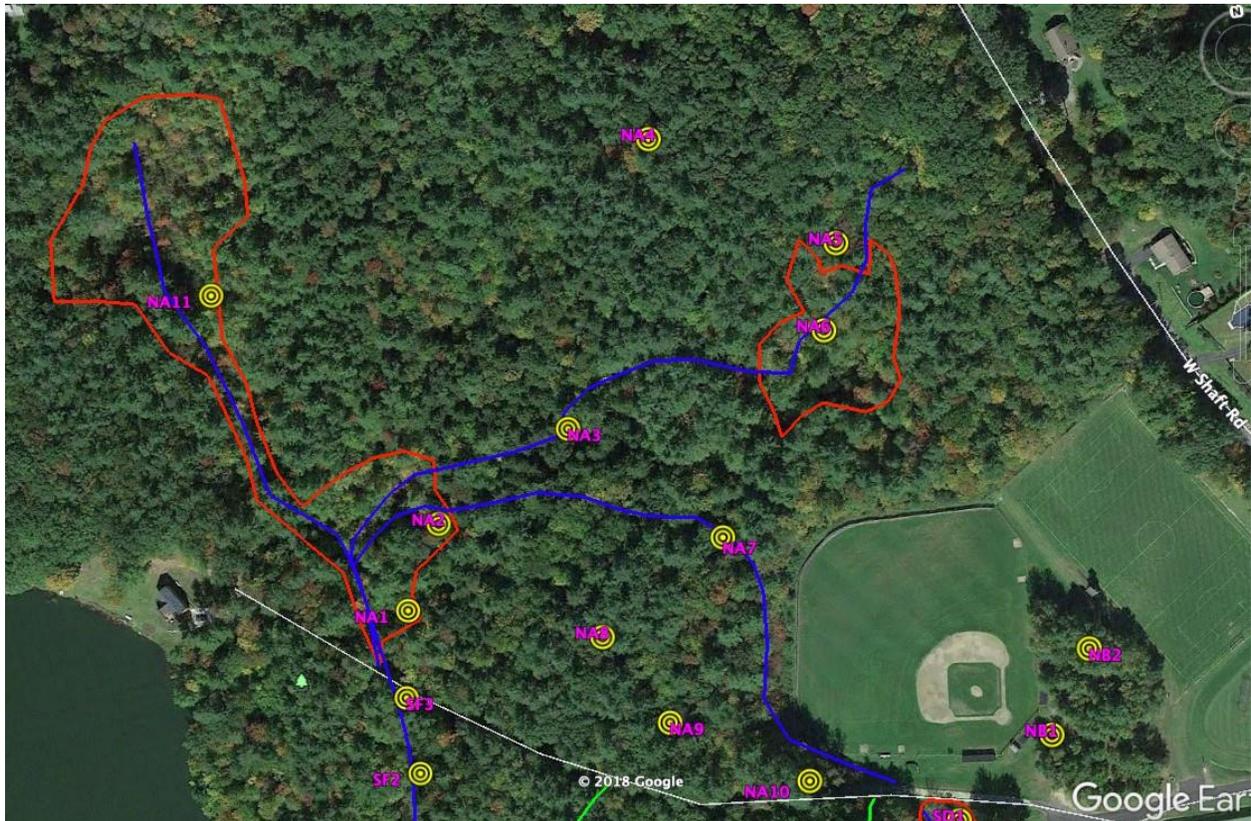

Figure 2: North side vegetation sampling plots. The thin white line along the bottom of the photo is a dirt access road that bisects the property. Yellow circles are the sampling plots, red polygons are forested wetlands, and blue lines are perennial and intermittent streams. *Map generated with Google Earth Pro software.*

Figure 3: South side vegetation sampling plots. The thin white line along the top of the photo is a dirt access road that bisects the property. Yellow circles are the sampling plots, green lines are the existing trail system, red polygons are forested and shrub wetlands, and blue lines are perennial and intermittent streams. *Map generated with Google Earth Pro software.*

Circular plots with a 15-foot radius were placed to maximize sampling of habitat diversity within the MCLA forest and plot size was chosen to facilitate future Tracheophyte surveys, in addition to Bryophytes and macrolichens. The 34 permanent plots were field-marked with .75" rebar, with the above ground portion painted yellow, and plot centers were georeferenced with a Garmin eTrex Legend® H GPS unit. A summary of plot center coordinates, elevations, and habitat types are listed in **Table 1**. South side plots are labelled SA- SF for south side, sections A-F, with sections delineated by the existing trail system. The north side has no formal trails and was divided into two sections, NA and NB. Section NA is forested, with a mosaic of embedded forested wetlands and NB is a small rocky, outcrop "island" surrounded by athletic fields. The preliminary list of bryophyte taxa present in the MCLA forest is in **Table 2** although this list will become larger once identification is complete.

TABLE 1: Vegetation Sampling Plot locations.

Plot	Section	Lat	Lon	Elev(m)	Elev(ft)	Habitat
NA1	North A	42.687702	-73.089255	298	977	Palustrine Forested Wetland
NA2	North A	42.688065	-73.088984	299	980	Palustrine Forested Wetland
NA3	North A	42.688393	-73.088108	304	996	Perennial Stream
NA4	North A	42.689589	-73.087353	312	1023	Deciduous forest
NA5	North A	42.689004	-73.086355	311	1022	Evergreen forest
NA6	North A	42.688639	-73.086499	309	1014	Palustrine Forested Wetland
NA7	North A	42.687812	-73.087291	309	1013	Intermittent Stream
NA8	North A	42.68746	-73.0881	307	1008	Deciduous forest
NA9	North A	42.68705	-73.08778	312	1023	Deciduous forest
NA10	North A	42.686702	-73.087013	314	1030	Evergreen forest
NA11	North A	42.689236	-73.09013	300	983	Palustrine Forested Wetland
NB1	North B	42.686741	-73.085556	316	1036	Rock outcrop, high light
NB2	North B	42.687094	-73.085272	319	1047	Rock outcrop, high light
SA1	South A	42.68451	-73.08504	315	1033	Palustrine Shrub Wetland
SA2	South A	42.68456	-73.08536	315	1034	Intermittent Stream
SA3	South A	42.68535	-73.08556	316	1037	Evergreen forest
SA4	South A	42.685764	-73.085103	315	1034	Manmade drainage ditch
SB1	South B	42.684222	-73.086791	323	1056	Deciduous forest
SB2	South B	42.684315	-73.087819	317	1041	Deciduous forest
SB3	South B	42.684408	-73.088267	316	1036	Evergreen forest
SB4	South B	42.68469	-73.08916	302	992	Deciduous forest
SC1	South C	42.684726	-73.086435	321	1053	Vernal pool
SC2	South C	42.684612	-73.087181	322	1056	Rock outcrop, low light
SC3	South C	42.685532	-73.0882	312	1023	Deciduous forest
SC4	South C	42.68568	-73.087363	317	1040	Deciduous forest
SC5	South C	42.685223	-73.08611	318	1043	Deciduous forest
SD1	South D	42.686433	-73.086175	315	1032	Palustrine Shrub Wetland
SD2	South D	42.6861	-73.08673	313	1028	Evergreen forest
SD3	South D	42.685994	-73.086088	318	1043	Palustrine Forested Wetland
SE1	South E	42.68629	-73.08762	315	1032	Deciduous forest
SE2	South E	42.68636	-73.08837	310	1018	Deciduous forest
SF1	South F	42.68514	-73.08956	297	973	Mucky, pondside seepage
SF2	South F	42.686965	-73.089347	295	968	Perennial Stream
SF3	South F	42.687316	-73.08935	298	976	Perennial Stream

TABLE 2: Preliminary bryophyte taxon list.

Andreaea rupestris	*Hypnum cupressiforme* var. *cupressiforme*
Anomodon attenuatus	*Hypnum cupressiforme* var. *filiforme*
Anomodon rostratus	*Hypnum curvifolium*
Anomodon rugelii	*Hypnum imponens*
Anomodon viticulosus	*Hypnum lindbergii*
Atrichum angustatum	*Hypnum pallescens*
Atrichum crispum	*Leptobryum pyriforme*
Atrichum undulatum	*Leptodictyum riparium*
Aulacomnium heterostichum	*Leucobryum glaucum*
Aulacomnium palustre	*Metzgeria furcata*
Barbula unguiculata	*Mnium hornum*
Bartramia pomiformis	*Neckera pennata*
Bazzania trilobata	*Orthothecium strictum*
Brachythecium campestre	*Orthotrichum obtusifolium*
Brachythecium rivulare	*Orthotrichum ohioense*
Brachythecium rutabulum	*Paraleucobryum longifolium*
Bryoandersonia illecebra	*Philonotis fontana* var. *americana*
Bryum argenteum var. *argenteum*	*Plagiomnium ciliare*
Bryum pseudotriquetrum	*Plagiomnium cuspidatum*
Callicladium haldanianum	*Plagiothecium denticulatum*
Calliergon cordifolium	*Plagiothecium laetum*
Calypogeia muelleriana	*Platygyrium repens*
Campylium hispidulum	*Pleurozium schreberi*
Cephalozia sp.	*Pohlia annotina*
Ceratodon purpureus ssp. purpureus	*Pohlia nutans*
Climacium americanum	*Pogonatum pensilvanicum*
Conocephalum salebrosum	*Polytrichastrum ohioense*
Dicranella heteromalla	*Polytrichastrum pallidisetum*
Climacium dendroides	*Polytrichum commune*
Dicranum flagellare	*Polytrichum juniperinum*
Dicranum montanum	*Polytrichum piliferum*
Dicranum scoparium	*Porella platyphylla*
Dicranum viride	*Pseudobryum cinclidioides*
Diphyscium foliosum	*Ptilium crista-castrensis*
Entodon seductrix	*Pylaisia polyantha*
Fissidens sp.	*Pylaisia selwynii*

Fontinalis novae-angliae	*Pylaisiadelpha tenuirostris*
Forsstroemia trichomitria	*Radula complanata*
Frullania bolanderi	*Rhodobryum ontariense*
Frullania eboracensis	*Rhytidiadelphus triquetrus*
Funaria hygrometrica var. *hygrometrica*	*Sphagnum fimbriatum*
Hedwigia ciliata	*Sphagnum* cf. *recurvum*
Helodium blandowii	*Tetraphis pellucida*
Herzogiella striatella	*Thamnobryum alleghaniense*
Hygroamblystegium varium var. varium	*Thuidium delicatulum* var. *delicatulum*
Hylocomiastrum umbratum	*Ulota crispa*
Hylocomium splendens	*Weissia controversa*

As of December 1, 2019, we have collected 395 bryophyte and macrolichen specimens (primarily bryophytes) from the established plots. Thus far, we have concentrated on terrestrial species that will be difficult to collect during the winter and early spring and have largely left epiphytic species for collection over the winter break. We estimate that our specimen collection is 70% complete. Student effort in the fall of 2019 focused on plot selection and layout and specimen collection, with the bulk of identification to take place in spring 2020. A computer sciences student recently joined the project and will be working on developing a database of our collection data and field and lab images. We plan to submit our final results for publication in *Rhodora* in June 2020.

References

Google Earth Pro version 7.3.2.5776 (64-bit). 2019. Massachusetts College of Liberal Arts Forest. 42.686726, -073.087827 (WGS84, decimal degrees), elevation 1030 ft. Eye alt. 3193 ft., viewed Dec. 1, 2019.

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