

What Lichens and Bryophytes can tell us about the Antrim Woodlot

Disturbance

What is most revealing about the woodlot is what is not there, rather than what is there. Lichen continuity indicators are infrequent on the woodlot. Lichen continuity indicators are lichen species that tend to occur in forests that have had little or no human disturbance and a continuous forest cover for a long period of time. The lack of lichen continuity indicators likely reflects a long period of human disturbance on the woodlot.

@ A few species of continuity indicators occurs along the brook, although the number and abundance is low. *Lobaria pulmonaria* and *Caliciales* are found there. Some *Caliciales* and *Lobaria scrobiculata* were found along the northern boundary line, near the east side.

Selva (1996) developed an Index of Ecological Continuity (IEC) for northeastern North America. The IEC is on a scale of 1 to 100, with 100 being the sites with high ecological continuity and almost no history of human disturbance. The IEC for Antrim is about 20. (A more thorough lichen survey would reveal more species and likely increase this value). Sites such as Panuke Ecological Reserve and Abrahams Lake (Nature Conservancy old Orowth property) would have IEC values of over 90.

Acid Precipitation

Lobaria spp. and some species of *Peltigera* and *Cladonia* are particularly sensitive to acid precipitation. The shale bedrock may contribute to acid conditions on the woodlot and may be a factor causing low abundance of *Lobaria* and *Peltigera*. Studies have shown that acid soil is reflected in acidity of tree bark. In this way, acid soil can lead to low abundance of acid intolerant lichen species. Acid rain may also be a contributing factor, which may be exacerbated by the already acid conditions.

Coarse Woody Debris

Xylographa spp. of lichen live only on dead wood. This species inhabits dead wood during the early stage of decay when the wood is relatively dry on the outside. Like many lichens, dispersal can limit propagation of *Xylographa*. There was no evidence of *Xylographa* on dead wood in this woodlot. This may suggest that there may not be enough dead wood, particularly in the early stages of decay, for *Xylographa* to disperse through this woodlot. A casual observation suggests that there are few obvious pieces of dead wood.

However, several large colonies of *Ichmadaphatia eriscetorum* were found. This species of lichen inhabits well rotted, moist dead wood. The presence of *eriscetorum* and the high presence of bryophytes suggests that there was more dead wood on the woodlot in the past.

Overall, the abundance and diversity of lichens is low on the woodlot compared to some other forests in Nova Scotia. Abundance and diversity of some invertebrates has been shown, in some studies, to be related to lichen abundance. (Lichens provide both habitat and food for some invertebrates such as spiders). Some ecologists have even suggested that lichen abundance may affect bird diversity (It would be interesting to see the results of the recent song-bird survey done on the woodlot).

The abundance, and perhaps diversity, seems higher with bryophytes than with lichens. The northern quarter of the lot has many springs and wet spots, and is quite moist and rich. This is where bryophyte diversity is highest. (There are a few species I have not seen before, but unfortunately I do not have enough time to identify them). All this bryophyte diversity creates habitat for invertebrates, salamanders, and other small wildlife species.

Nutrient Cycling

Lobaria spp. and *Peltigera apothosa* are nitrogen fixers, and although these species were found on the woodlot, abundance was low. Will this affect the nitrogen cycle? Probably not, although a few studies have examined the impact that lichen nitrogen fixers have on ecosystems. Studies in western North America suggest that these species have a significant effect. The single study done in eastern North America and several studies done in Europe suggest that the effect is in the micro-site conditions, therefore the more *P. apothosa* and *Lobaria* present, the more nitrogen rich micro-site present.

Lichens trap aerosol nutrients, acting as sinks for nutrients. Many of these airborne nutrients would be lost to the forest ecosystem if not trapped by lichens. Some studies have shown that airborne nutrients can significantly contribute to the nutrient cycle of forests (although not the major source). Species like white-tailed deer and many invertebrates take advantage of the nutrients found in lichens. With a low abundance of lichens in the woodlot, this aspect of nutrient cycling is reduced. However, the overall effect may not be large because lichens are slow growing anyway.

Lichens and Bryophytes of the Antrim Woodlot

Lichens

lehmaphalia eiiscetorum
Lobaria pulrnonaria
L. quercizans
L. scrobiculata
Usnea pendulosa
U. trichodea
U. subfioridana
Alectoria sannentosa
Hypogymnia physodes
Platismatia glauca
P. tuckermanii
Loxospora elatina
L. ochrophaea
Lopadium disciforme
Thelotrema spp. Chaenotheca
chrysocephala Calicium spp.
Peltigera apothosa
Mycoblastus sanguinarius
Lepraria finkii
Parmelia sulcata
Pertusaria amara
Bryoria furcellata
B. nadvomikiana

Bryophytes

Diplophyllum albicans
Bazzania hilobata
Hylocomium splendens
Sphagnum spp.
Rhytidiadelphus triquetris
Dicranum scoparium
Picurozium schreberi
Frullania spp.
Ulota cnispata
Leucobryum glaucum
Polytrichum commune
P. spp.
Thuidium deflexatum
Brachythecium spp.
Climacium dendroides
Sphagnum squarrosum

Robert Cameron
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