A survey of mosses (Bryophyta) native to Greenwoods Conservancy, quadrants d3 and d4.

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INTRODUCTION

Greenwoods Conservancy is a property of more than a thousand acres that is protected by New York State and managed by the Biological Field Sation. The land is set aside under a conservation easement through the Otsego Land Trust. Part of the purpose of this easement is to provide opportunities for education and scientific research. The Biological Field Station manages Greenwoods and though most parts of it are left "forever wild", some meadows are mowed periodically to maintain a first-year succession community (Taylor 1994). Other than the classification of *Sphagnum* spp. in Cranberry Bog, there has been little work done to classify and collect any nonvascular plants, such as terrestrial mosses, at Greenwoods.

This study is a survey of the terrestrial mosses present in quadrants D3 and D4 of Greenwoods. Figure 1 is a map with the area studied enclosed. Identifying mosses involves the development of an entirely new focus and new vocabulary. Because the bryophytes are nonvascular they are structured differently then any other plant group. The Class Musci, or true mosses, are different from all other bryophytes in structure as well (see Figs. 2 & 3). The fact that mosses are nonvascular means that they have no internal transport methods for food. Any nutrient movement is directly from cell to cell by diffusion. It is for this reason the mosses are small and many times are more successful in a wet habitat. The sperm are required to swim through the ambient moisture on the plant to reach the egg so they depend on a wet environment for fertilization.

A diagram of the basic structure of a moss is presented in Figure 2. Mosses have two distinct life stages. The first half of a moss' life is spent developing the gametophyte which includes the "leaves" and "stems" and is the part of the moss which photosynthesizes food for the plant. At some point in the gametophyte's development, it begins to support the sporophyte. The sporophyte is the reproductive part of the plant. The beginning of the sporophyte is the seta, or stalk. At the end of the seta is the capsule, where the spores are fertilized and kept until they are ready to disperse and grow. The shape of the sporophyte is very distinctive. It is often very difficult to identify a moss not having one. However, it is possible to identify some mosses from their cell structure and general shape. Most mosses have a large number of hyaline (clear) cells at the base of the leaf which are full of water. When these cells dry out the leaves constrict and greatly change the appearance of the moss making identification difficult.

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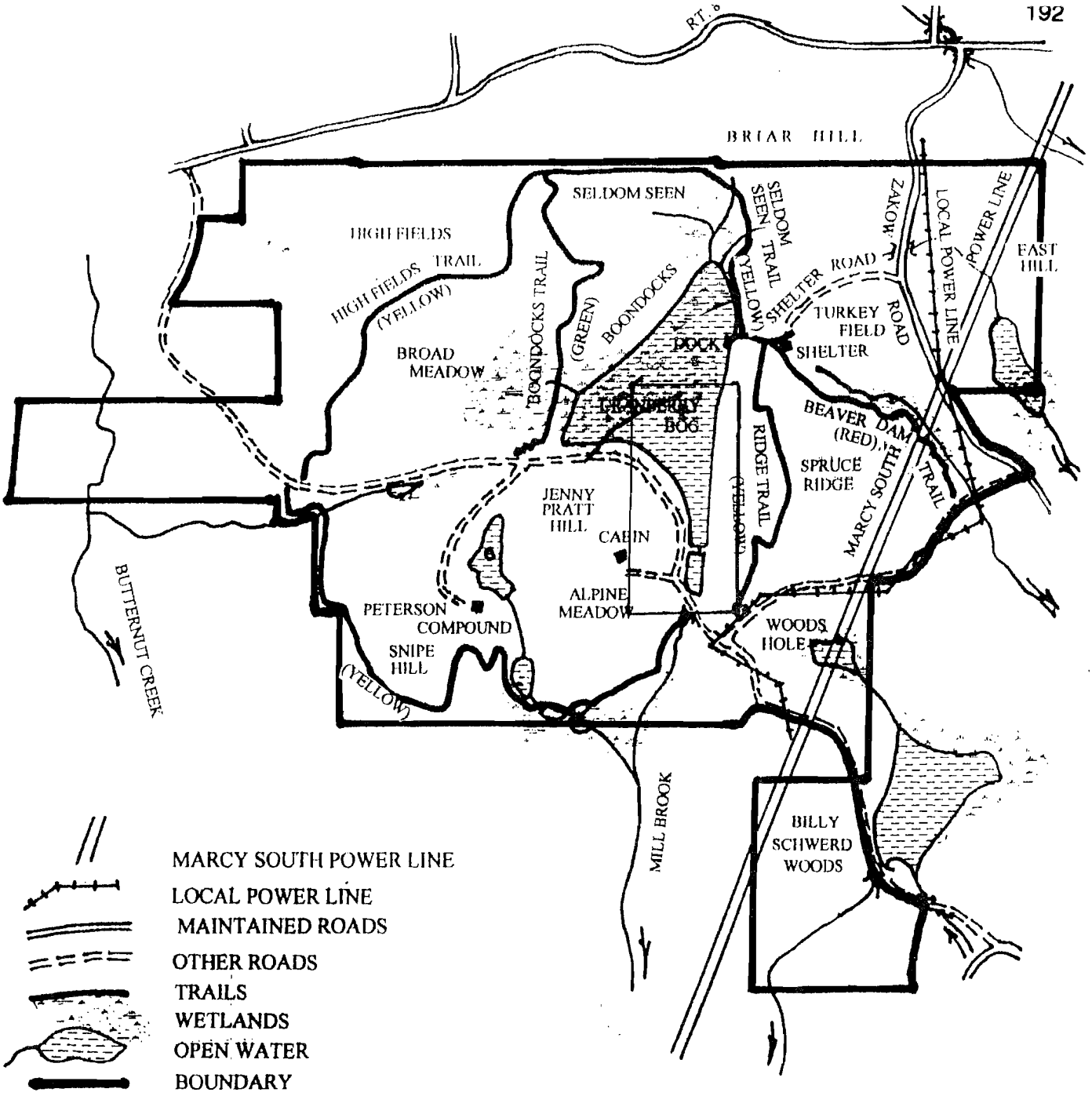

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Figure 1. Map of Greenwoods Conservancy. The study area is enclosed in the rectangle.

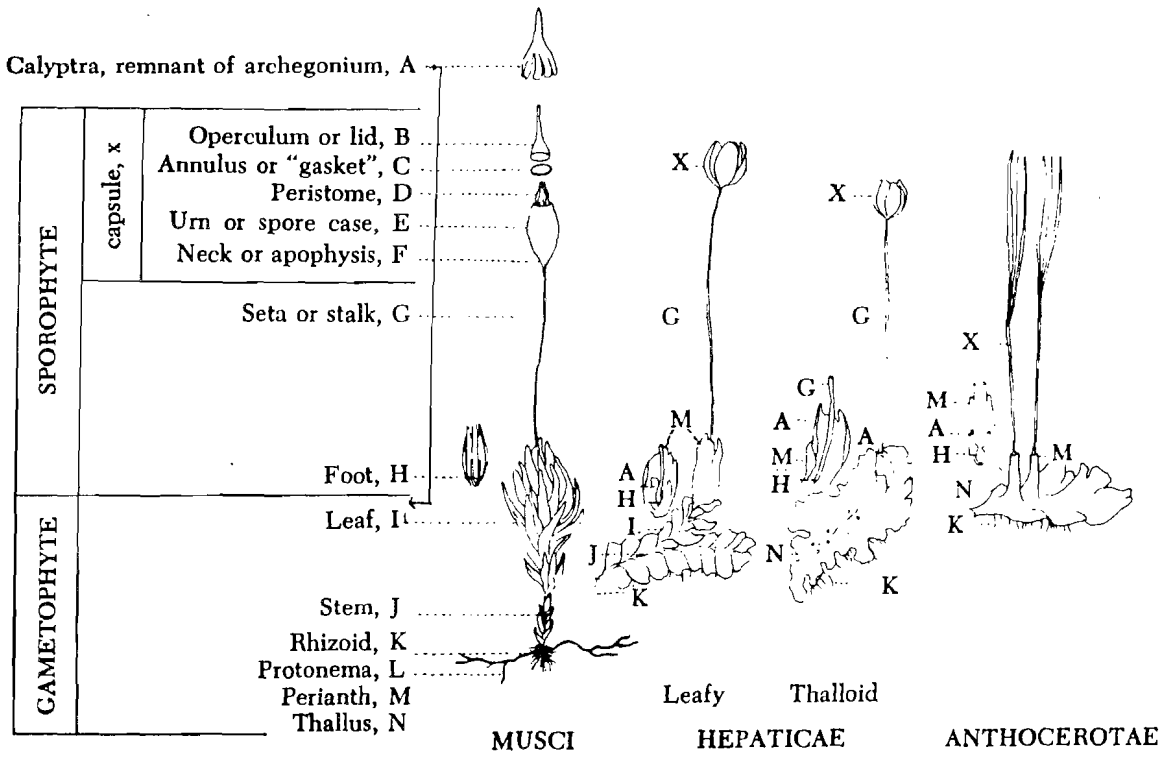

Figure 2. Diagram of Bryophyte structure. From left to right: *Pthchomitrium incurvum, lophocoles heterophylla, Pellea epiphylla, Phaeoceros laevis* (Conrad *et al.*, 1979).

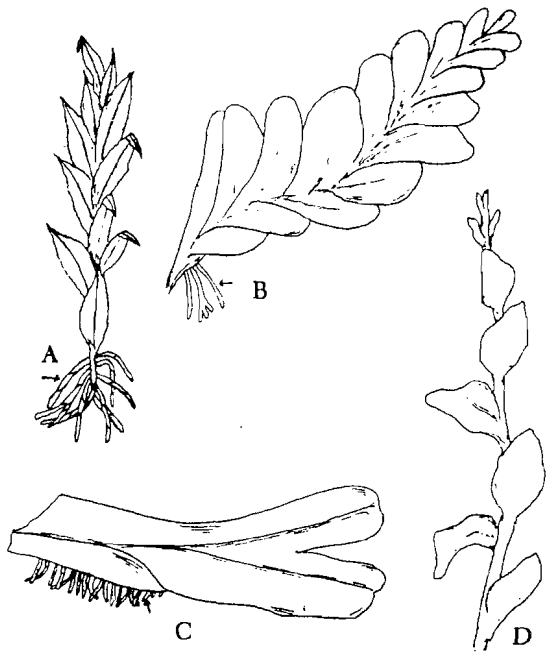

Figure 3. "Leaves", "stems", and "roots" of a true moss (A). Liverwort structures (B, C, & D).

METHODS

Sampling: Terrestrial mosses were sampled in two quadrants within Greenwoods, both of which contained sections of Cranberry Bog. It was hoped that by sampling from the bog edge to further back in the woods, most of the types of mosses present in Greenwoods would be obtained.

To gather the moss, a knife or forceps were used to tear it from its mat. Specimens were then placed in paper envelopes labeled with the date, quadrant, sample number, and some notes on the environment. On the first sampling trip, thirteen samples were collected. On the second sampling trip, twenty one samples were collected.

Identification and Storage: After sampling, the mosses were brought back to the Field Station where, when possible, they were identified to species with the help of Jeane Bennet-O'Dea, (O'Dea, 1997). Before the samples were identified it was necessary to soak them in warm water to restore their original shape. Diagnostic features included general shape, the attributes of the gametophyte and sporophyte, and cell structure. Both the dissecting and compound microscopes were used. To aid in identification, three books were used (Conard 1956; Conrad *et al.* 1979; Vitt *et al.* 1988).

After the mosses were identified, the genus and species names were recorded on their respective envelopes. The mosses were allowed to dry and then they were placed in their envelopes and curated. Moss does not tend to mold and is not generally susceptible to other forms of decay, so this file should last indefinitely.

RESULTS AND DISCUSSION

Between the two quadrants, fifteen different species of mosses were identified. Of the thirty four samples collected, ten were immature and therefore unidentifiable. All of the mosses collected were taken from terrestrial sources. Many that were found were growing at the bases of trees or on fallen logs. Within twenty feet of the bog edge, the habitat was one of hardwoods and pine trees without excess moisture. It was in this area that the common woods mosses, such as the *Polytricum*, were found. Closer to the bog edge the soil was much wetter and it supported a large variety; this is where the mosses which demand a wetter habitat, such as the *Dicranella*, were found. Table 1 provides a complete list of the species that were found. This survey is a preliminary indication of mosses growing in the forested area of Greenwoods. More work needs to be done in this area, and certainly more work needs to be done concerning the field and aquatic mosses present at Greenwoods. Both sampling trips this year were in early August. If this study is continued in the other habitats it would probably be beneficial to sample earlier in the year as well as later.

Total number of samples-21
Species identified
Polytricum ohioense (4)
Hookeria acutifolia
Lucobryum albium
Homomallium adnatum (2)
Diphyscium foliosum (3)
Tetraphis pellucida (2)
Platydictya subtile (2)
Dicranella varia
Ambylstegium serpens
Brachythecium velutinum
Immature or unidentified samples: 3

Quadrant-D4
Total number of samples-13
Species identified:
Campyoium stellatum (2)
Drepanocladus vernicosus
Lucobryum albium
Dicranella varia
Bryum ulignosum
Immature or unidentified samples- 7

Table 1-A complete list of the Genus and species names of the mosses that were identified at Greenwoods Conservancy, Quadrants D3 and D4.

Quadrant-D3
Total number of samples-21
Species identified
Polytricum ohioense (4)
Hookeria acutifolia
Lucobryum albium
Homomallium adnatum (2)
Diphyscium foliosum (3)
Tetraphis pellucida (2)
Platydictya subtile (2)
Dicranella varia
Ambylstegium serpens
Brachythecium velutinum
Immature or unidentified samples: 3

Quadrant-D4
Total number of samples-13
Species identified:
Campyoium stellatum (2)
Drepanocladus vernicosus
Lucobryum albium
Dicranella varia
Bryum ulignosum
Immature or unidentified samples- 7

Table 1-A complete list of the Genus and species names of the mosses that were identified at Greenwoods Conservancy, Quadrants D3 and D4.

REFERENCES

Bennet-O'dea, Jeane 1997. Personal Communication. Biological field Station, State University of New York, Rd #2, Box 1066 Cooperstown, NY 13326.

Conard, Henry S. 1979. Revised by Paul Redfern Jr. How to know the Mosses and Liverworts. Wm. C. Brown Company Publishers, Dubuque, Iowa.

Conard, Henry S. 1956. How to know the Mosses and Liverworts. Wm. C. Brown Company Publishers, Dubuque, Iowa.

Vitt, Dale H., Janet E. Marsh, Robin B. Bovey 1988. Mosses, Lichens, and Ferns of Northwest North America. Lone Pine Publishing, Redmond, WA.