Field Guide to the Moss Genera in New Jersey

With Coefficient of Conservation and Indicator Status

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Acknowledgements

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Introduction

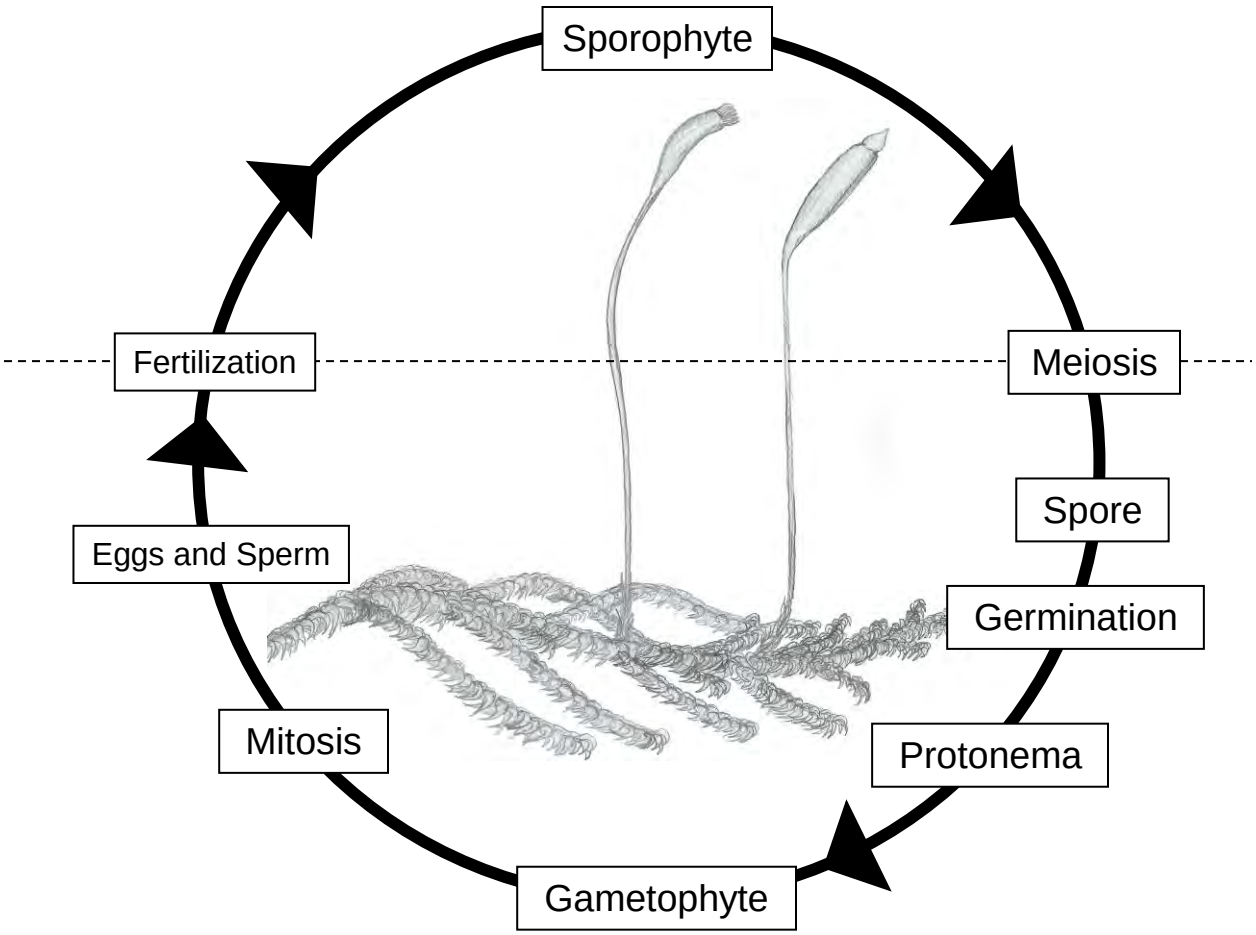
The mosses belong to a group of plants known collectively as the bryophytes. Along with the mosses, the bryophytes also include the liverworts and hornworts. This treatment will focus only on the mosses known and suspected for the state of New Jersey.

Considered to be some of the most primitive of plants, the mosses and their allies (liverworts and hornworts) are often overlooked. These plants are small; they do not produce colorful flowers; and for the most part they have not been widely used by humans. The bryophytes are an incredibly diverse group, second only to flowering plants. Upon magnification, the exquisite appearance of mosses can be observed, an exquisiteness rivaling even the most beautiful of flowers.

Alternation of Generations

The life cycle of bryophytes, like all plants, is an alternation of haploid and diploid generations connected by meiosis and fertilization. The dominance of the haploid generation and ready observation of both generations in bryophytes make bryophytes unique among plants. Beginning with a haploid spore arriving in a suitable habitat, the spore germinates producing a filamentous structure reminiscent of a green alga known as the protonema. The protonemal stage takes various forms in the different bryophyte taxa. Protonema can often be observed on moist soil in and along woodland trails. The protonema eventually produces buds that develop into the leafy haploid gametophyte shoots that most recognize as a moss. The leafy gametophyte matures as its name implies produces the reproductive structures that produce the gametes (egg and sperm). The male and female reproductive structures can form on the same shoot or on separate shoots depending on the species. The male structure is a microscopic sausage shaped structure called an antheridia and it produces motile sperm. The sperm have whip-like tails that propel them through water. The female structure produces an egg at the base vase-like structure, the archegonia, with a very long neck. The moss life cycle continues when the sperm are released into a thin film of water, usually following, the sperm swims in the thin film of water to the archegonia and down the neck to fertilize the egg. Some species produce a specialized cup-like structure around the archegonia that greatly increase the dispersal distance of the sperm beyond the distance accomplished by a sperm swimming alone. The sperm are expelled from the “splash cup” along with a water droplet.

The egg and sperm fuse into a zygote, the beginning of the diploid sporophyte generation. The cells of the zygote divide and continue to divide creating the embryo. The sporophyte is not leafy and is dependent on the gametophyte generation, at least partially, for nutrients and water. The sporophyte consists of a foot, a stalk called a seta, and a capsule. The capsule is the location of spore production. The seta raises the capsule up to aid in spore dispersal and connects the capsule to the foot that is embedded in gametophyte tissue conducting water and nutrients. The old archegonia can remain stretched over the developing capsule and is important for proper capsule development. This remnant gametophyte tissue is called the calyptra. Below the calyptra is a covering called the operculum that encloses the pore from which spores are released. The operculum falls off, when mature. The pore is often surrounded by a ring or two of teeth that respond to humidity. The teeth typically cover the opening when moist and reveal the opening when dry facilitating the release of spores when they are likely to be blown on the wind.



Bryophytes also have the tendency for asexual reproduction which bypasses the sexual process described above, but results in offspring genetically identical to their parents. Most mosses can reproduce simply through fragments of leaf and stem tissue, but some have specialized structures such as gemmae and brood bodies. The cells of mosses retain the ability to grow into a whole new plant.

MOSSES - *Bryophyta*

The mosses make up the largest portion of the bryophytes with about 10,000 species worldwide. The diversity of mosses tends to increase as one moves away from the tropics, where the liverworts dominate. In New Jersey, the mosses can be divided into three major groups including the granite mosses, the peat mosses, and the true mosses.

Granite Mosses

The granite mosses in New Jersey include only a single genus, *Andreaea*. The sporophytes of *Andreaea* don't develop a seta, instead the stalk, which elongates with the capsule, develops from the leafy gametophyte and is called a pseudopodium (*false foot*). The mature capsules release their spores

through slits formed from weak longitudinal lines (base to the tip), very unlike the typical moss capsule that releases spores through a terminal pore. The mature capsules look like tiny Chinese lanterns, resulting in the group's common name, Lantern Mosses. The typically reddish brown gametophytes are simple, upright shoots that grow in dense, small to very extensive tufts over siliceous rock (acidic) typically at high altitudes or high latitudes.

Andreaea sp. with capsules - Photo by Keith Bowman

Peat Mosses

The peat mosses include species from a single genus, *Sphagnum*. In New Jersey, and throughout its range it is a very diverse group. Although an members of this genus are readily recognized as peat mosses, they are not easily identified to species, especially in the field. Peat mosses are found in moist conditions (associated with very wet sites) and form hummocks and extensive carpets in bogs and swamps. The individual shoots have a densely branched head called a capitulum, shaped variously as pom-poms, stars, and other shapes. The branches below the capitulum are more loosely inserted and on close examination there are two types of branches, spreading branches growing out from the stem and the pendant branches hanging along the stems. These two branch types emerge in groups called fascicles. The shape of the capitula, the pattern of branching, leaf shape and arrangement are useful in identifying species. Cell structure and arrangement are also important for identification, but they are only visible with a microscope. The cells in the leaves of *Sphagnum* are arranged in a network of large hollow cells separated by long thin green photosynthetic cells. The majority of the leaf is made up of the large empty cells that are responsible for the large water-holding capacity of *Sphagnum*, up to 20 times its dry weight. The sporophyte, when present, consists of a spherical capsule with a little cap that sits atop a pseudopodium, as in the granite mosses. When mature, the pressure inside the capsule builds as it dries in the heat of the summer, until the cap gives way and the spores explode out of the capsule.

Sphagnum riparium with sporophytes - Photo by Keith Bowman

Peat moss gets its common name from the peat, partially decomposed plant material accumulated over time in the conditions created by the *Sphagnum* that slows decomposition. *Sphagnum* is responsible for wetland formation and expansion. When growing along lakes and ponds, the *Sphagnum* can grow into the water forming floating mats and changing the pH of the environment. Peat begins to buildup below the mat, eventually filling the body of water. The *Sphagnum* can also invade surrounding forests, carrying with it huge amounts of water which flood the forests killing off the trees and extending the peatlands out from the water's edge (Schofield, 1985).

The same properties of *Sphagnum* that results in the extensive peatlands of the world have also been exploited for various other uses. The antimicrobial nature and the tremendous absorptive quality made *Sphagnum* an ideal and effective bandage material throughout history. *Sphagnum* and the associated peat have become widely used in the horticulture trade as a medium for growing seedlings and cuttings, a soil additive, and a mulch due to its tremendous water holding capacity. *Sphagnum* is also burned and the smoke permeates sprouted barley malt, which is then used to make Scotch whisky, and is responsible for its unique aroma. Peat has also been utilized for centuries in northern European countries where it is readily available as a source of heat. Peat is harvested, dried and made into bricks that burn less efficiently than coal, but hotter than wood. *Sphagnum* can produce up to 12 metric tons per hectare per year, a high growth rate relative to other mosses, making it a potential candidate for management as a renewable economic resource (Schofield, 1985). By far the genus *Sphagnum* is the most utilized of all the bryophytes.

True Mosses

The true mosses are the most common and most diverse group of mosses. The true mosses have two general growth forms that are used in identification and classification, the acrocarpous and pleurocarpous mosses. The term acrocarpous (in Greek *acro-* means highest, and *–carpous* for fruit) refers to mosses with upright shoots that have few to no branches and produce their sporophytes at the

shoot apex. The pleurocarpous mosses (*pleuro*- having to do with a side, and *–carpous* for fruit) often have horizontal growing shoots with abundant branching and they produce their sporophytes from short lateral branches. Perhaps the best characteristic of the true mosses is the complex sporophyte held aloft on a stalk of sporophyte tissue called a seta. Most true moss capsules release their spores through a pore in the end, often surrounded by a ring of teeth, which can open and close with changes in humidity controlling the release of spores. The length and color of the seta and shape of the capsule can aid in identification.

Capsule of *Callicladium haldanianum* - Photo by Bob Klips

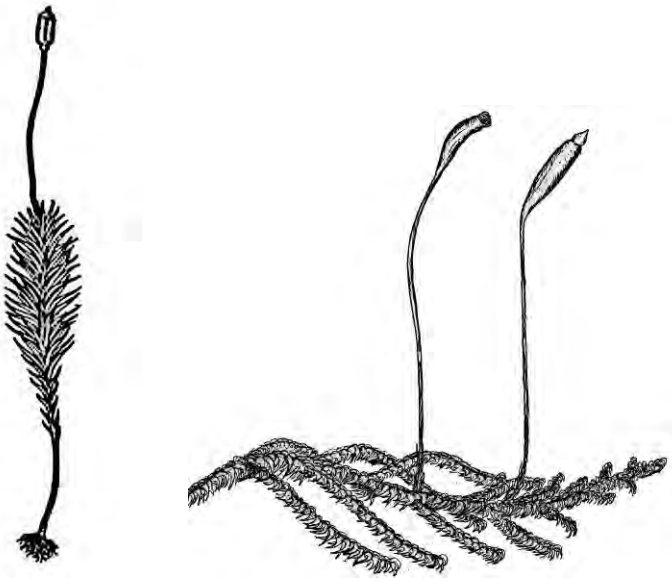
Primary Key to Moss Genera of New Jersey

This key is organized around three key characteristics that are observable in the field. The three characteristics are growth form, costa length, and leaf shape.

Growth Form

Mosses have two potential growth forms. Acrocarpous (1) mosses have a generally upright growth form and produce their sporophytes from the apex of the shoot. The upright growing mosses typically have few or no branches. Pleurocarpous (2) mosses have a general horizontal growth form and produce their sporophytes from side branches. The horizontal growing mosses typically have distinct branches, often with distinct patterns of branching, although some taxa may have little or no branching.

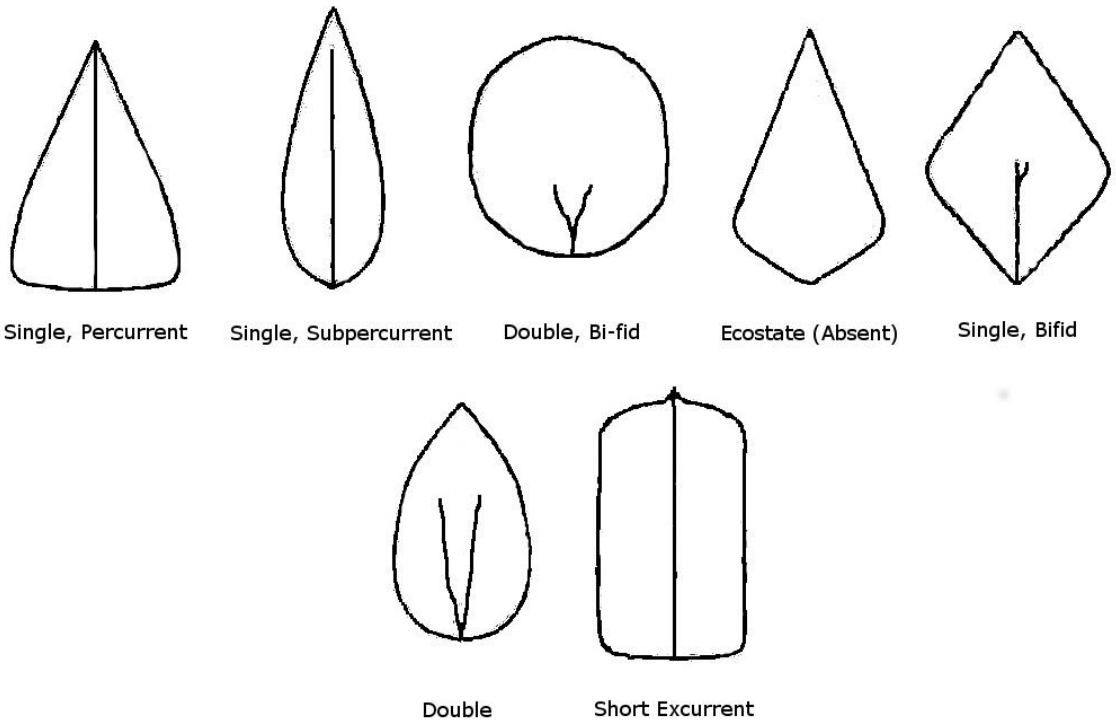
Recognizing the growth form is the first step to identifying moss taxa. Although this first characteristic seems straight forward, there are species or stages that will challenge this simple concept. The key will attempt to account for the variability in these taxa.



Moss growth forms: Upright growth form or acrocarpous (Left) and horizontal growth form or pleurocapous (Right)

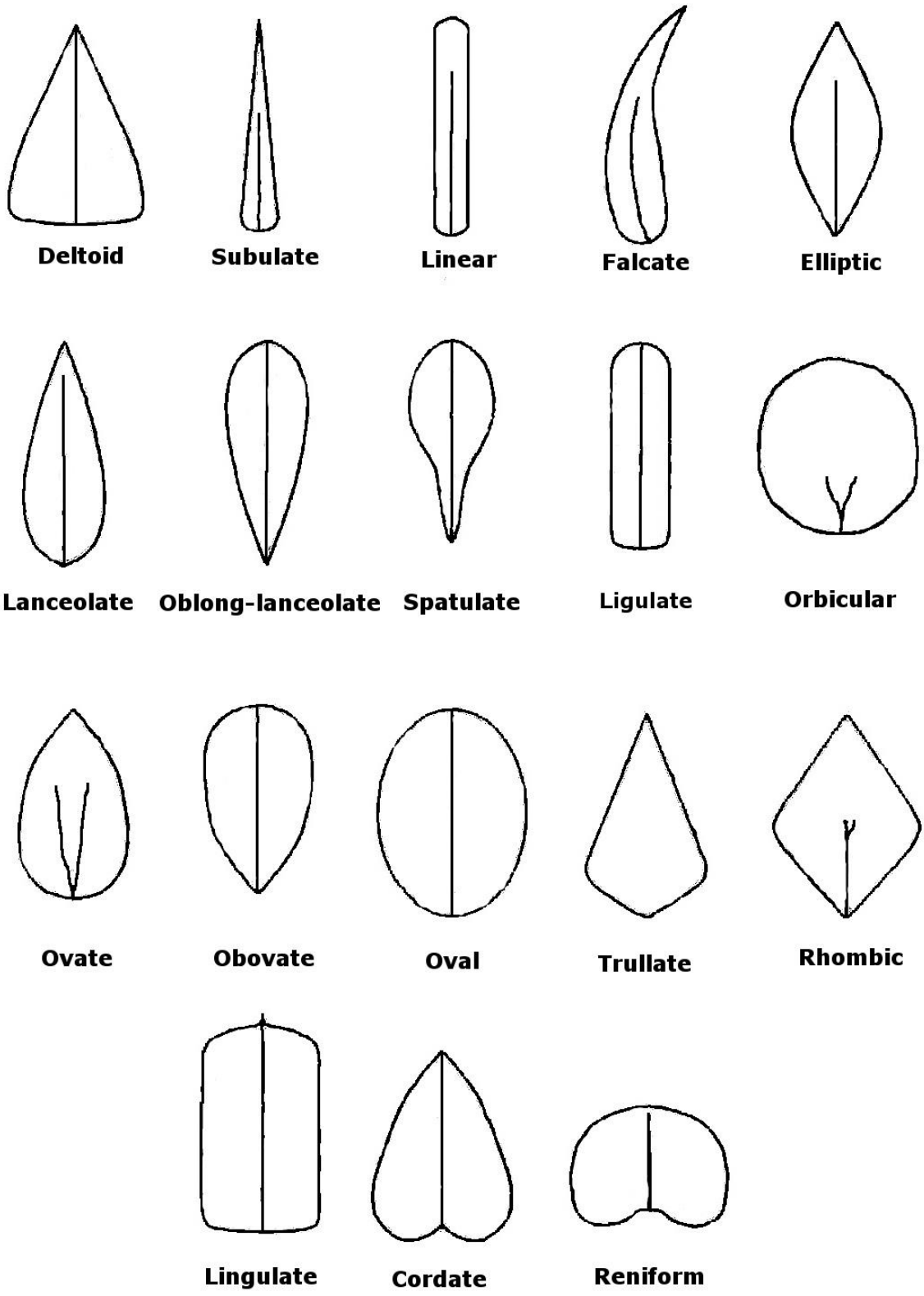
Costa

Before examining the shape of the moss leaf the presence or absence of a costa, or mid-rib generally becomes apparent. The costa is a thick structural component that is typically darker than the rest of the leaf tissue and therefore stands out when present. The costa, even when present, may be difficult to see because it can be very short and lost in the base of the leaves. Some species will have a double costa, but because there are few local species with this characteristic, the key is divided based on the length of the costa and not whether it is single or double. Sometimes the costa extends right beyond the leaf apex and can form a sharp point or a hair-like extension or awn that can differ in color from the rest of the leaf. These features will be important for identifying groups of taxa and individual species. In the primary key there are three possible choices: the costa is not visible (1), extends to the leaf middle (2), or into the leaf tip or beyond (3). Below are some examples of costa lengths that may be found within the descriptions later in the guide.



Leaf Shape

Moss leaves come in an astounding array shapes. The list of descriptions of leaves would be daunting to even the most intrepid of beginning moss students. For the purpose of this guide we will focus on the location of the widest portion of the leave, a simple feature that determines the general shape of the leaf and a feature that should be easily discerned in the field with a hand lens. There are three possible choices in the primary key: the base (1), the leaf middle (2), and the leaf tip (3). To decide try dividing the leave into thirds and assign the value based on which segment is widest. For leaves that may be widest in multiple regions, choose the highest region. For example, a leaf that is strap like or tongue shaped would be described as being widest in the upper regions. Later in the guide, the leaves will be described in more detail with some of the following terms.



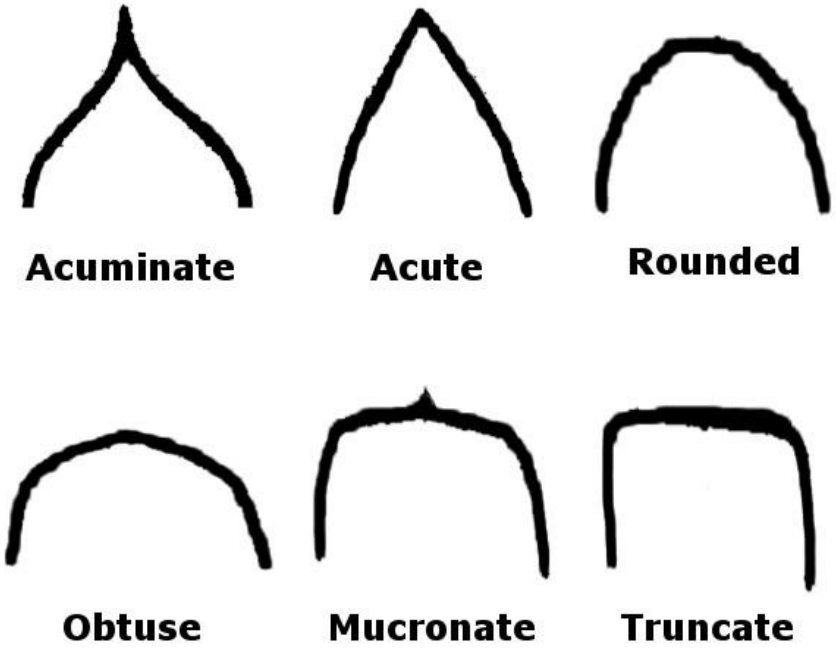
There are several other characteristics that are relatively easy to recognize in the field that will be used throughout the key to identify moss genera.

Leaf Size

It is difficult to accurately estimate leaf size in the field, but it is possible to accurately estimate the length of the leaf relative to its width. This characteristic is a component of moss leaf shape and will allow further narrowing of the possible identifications. Leaves are generally short (1-2 times) relative to their width, medium (2-5 times), and long (greater than 5 times).

Leaf Apex

Another characteristic that helps to distinguish the shape of a moss leaf is the shape of the apex of the leaf. The apex can be rounded, narrowed to a small point, or as is more typical long taper to a sharp point. The differences taken with the previously mentioned characteristic should allow for distinguishing individual moss taxa.

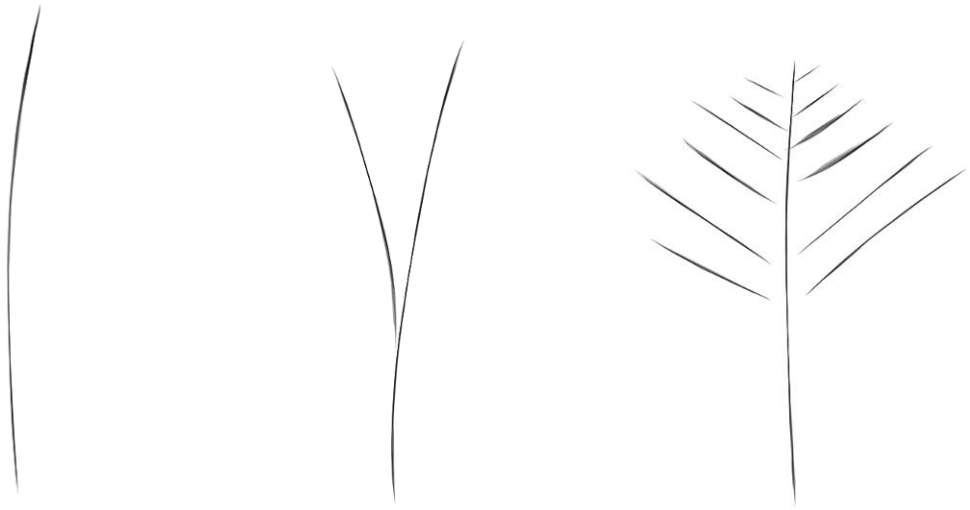


Leaf Margin

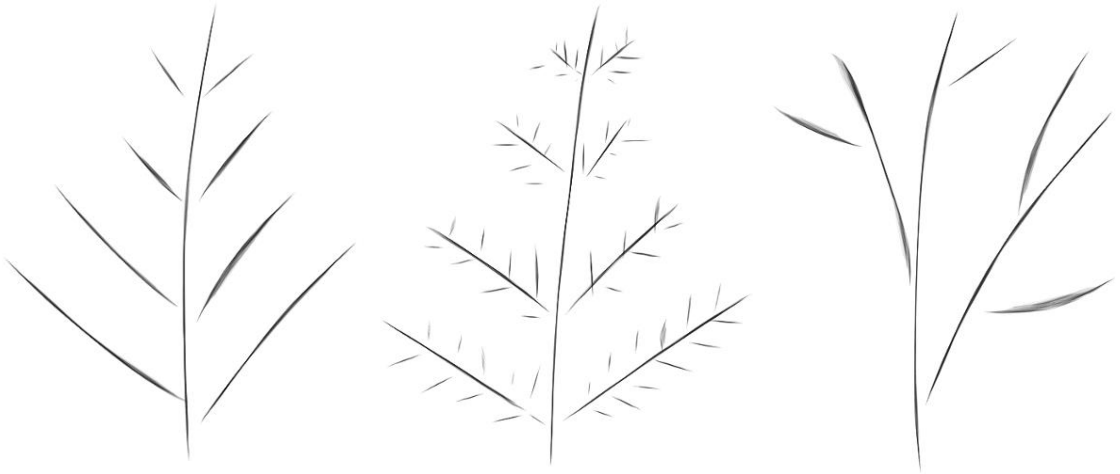
In addition to the characteristic of the leaf apex the margins of the leaves can be helpful distinguishing characteristics. Some species will have a differentiated border formed from cells of a different shape and these borders can consist of a single layer or multiple layers. Leaf margins can also be smooth (entire) or variously toothed (serrulate, serrate, denticulate, dentate, etc.). This characteristic does take a little practice to recognize, especially under low magnification. There are many species with large teeth formed from multiple cells that are very easy to distinguish in the field, but there are others where the teeth are formed from a portion of the cell that is out of line with its neighbors, which may be more difficult to identify in the field. Most marginal teeth are single, but a few taxa demonstrate double teeth, which take practice to see in the field.

Branching

Branching patterns can be characteristic of different moss taxa. Branching in mosses is often related to growth form. Typically acrocarpous mosses have little or no branching, while pleurocarpous mosses are variously branched; some taxa possess quite distinctive branching patterns. Branching can be irregular and unorganized, to highly organized and uniform as in pinnately branched stems. *Sphagnum* spp. have a distinct branching pattern where the branches are more or less organized into a head or capitulum at the stem tip and the other branches are organized into clusters or fascicles. The fascicles are typically composed of spreading that extent outward from the stems and pendant branches that hang downward along the stems. *Sphagnum* is generally easily recognized by this growth habit.



Branching patterns: Unbranched (Left), Forked or Bifid (Middle), Dendroid or Tree-like (Right).



Branching patterns: Pinnate (Left), Bipinnate (Middle), Irregular branching (Right).

Three Field Characteristic

Characteristics	Options	
Growth Form	Upright Growth Form	1
	Horizontal Growth Form	2
Costa	No Visible Costa (may be short, double or absent)	1
	Costa Extending to Leaf Middle	2
	Costa Extending into Leaf Tip or Beyond	3
Leaf Shape	Leaf broadest nearest the base	1
	Leaf broadest near the middle	2
	Leaf broadest near the apex	3

Steps for use of the Keys to Identify Moss Genera

1. Select the best option for your specimen from each of the three characteristics in the table above. Determine the correct option number.
2. Combine the three option numbers into a 3-digit group identifier.
3. Locate the 3-digit group identifier in the primary key (next page) and follow the key to determine the genus or genera that match your specimen. (page numbers will be given for the potential genera)

Primary Key

111 – Upright growing, costa short or not visible, leaves broadest near base

1a. Unbranched 2
- 2a. Leaves less than 5 times as long as wide 3
  - 3a. Margins smooth ..... **Buxbaumia** (p. 100)
  - 3b. Margins toothed ..... **Key A** (p. 16)
- 2b. Leaves greater than 5 times as long as wide 4
  - 4a. Margins smooth ..... **Polytrichum** (p. 209)
  - 4b. Margins toothed ..... **Key B** (p. 16)

1b. Branched 5
- 5a. Shoots with a capitulum, branches in fascicles ..... **Sphagnum** (p. 243)
- 5b. Shoots without a capitulum, branches not fascicled 6
  - 6a. Leaves Tapered at the apex ..... **Key C** (p. 16)
  - 6b. Leaves Rounded at the Apex ..... **Key D** (p. 16)

112 - Upright growing, costa short or not visible, leaves broadest near middle

1a. Unbranched ..... **Ephemerum** (p. 125)
1b. Branched ..... **Scorpidium** (p. 57)

113 - Upright growing, no costa visible, leaves broadest near apex

..... **Andreaea** (p. 60)

121 - Upright growing, costa to leaf middle, leaves broadest near base

1a. Unbranched 2
- 2a. Leaves tapered at the apex 3
  - 3a. Margins smooth ..... **Key E** (p. 16)
  - 3b. Margins toothed ..... **Mnium** (p. 183)
- 2b. Leaves rounded at the Apex ..... **Mnium** (p. 183)

1b. Branched 4
- 4a. Leaves tapered at the apex 5
  - 5a. Margins smooth ..... **Key F** (p. 16)
  - 5b. Margins toothed ..... **Key G** (p. 16)
- 4b. Leaves rounded at the apex ..... **Key H** (p. 18)

122 - Upright growing, costa to leaf middle, leaves broadest near middle

1a. Unbranched ..... **Mnium** (p. 183)
1b. Branched ..... **Scorpidium** (p. 158)

123 - Upright growing, costa to leaf middle, leaves broadest near apex

..... **Mnium** (p. 183)

131 - Upright growing, costa to leaf apex, leaves broadest near base

1a. Unbranched 2
2a. Leaves less than 5 times as long as wide 3
3a. Leaves tapered at the apex 4
4a. Margins smooth ..... **Key I** (p. 18)
4b. Margins toothed ..... **Key J** (p. 20)
3b. Leaves rounded at the apex 5
5a. Margins smooth ..... **Key K** (p. 20)
5b. Margins toothed ..... **Key L** (p. 21)
2b. Leaves greater than 5 times as long as wide 6
6a. Leaves tapered at the apex 7
7a. Margins smooth ..... **Key M** (p. 21)
7b. Margins toothed ..... **Key N** (p. 22)
6b. Leaves rounded at the apex ..... **Fissidens** (p. 129)
1b. Branched 8
8a. Leaves Less than 5 times as long as wide 9
9a. Leaves tapered at the apex 10
10a. Margins smooth ..... **Key O** (p. 24)
10b. Margins toothed ..... **Key P** (p. 24)
9b. Leaves rounded at the apex 11
11a. Margins smooth ..... **Key Q** (p. 25)
11b. Margins toothed ..... **Ptychostomum** (p. 96)
8b. Leaves greater than 5 times as long as wide
12a. Margins smooth ..... **Key R** (p. 25)
12b. Margins toothed ..... **Key S** (p. 25)

132 - Upright growing, costa to leaf apex, leaves broadest near middle

1a. Unbranched 2
2a. Leaves less than 5 times as long as wide 3
3a. Leaves tapered at the apex 4

4a. Margins smooth ..... **Key T** (p. 25)
4b. Margins toothed ..... **Key U** (p. 26)
3b. Leaves rounded at the apex 5
5a. Margins smooth ..... **Key V** (p. 26)
5b. Margins toothed ..... **Key W** (p. 27)
2b. Leaves greater than 5 times as long as wide 6
6a. Leaves tapered at the apex 7
7a. Margins smooth ..... **Key X** (p. 27)
7b. Margins toothed ..... **Key Y** (p. 27)
6b. Leaves rounded at the apex 8
8a. Margins smooth ..... **Key Z** (p. 27)
8b. Margins toothed ..... **Fissidens** (p. 129)
1b. Branched 9
9a. Leaves less than 5 times as long as wide 10
10a. Leaves tapered at the apex 10
11a. Margins smooth ..... Key AA (p. 27)
11b. Margins toothed ..... Key AB (p. 28)
10b. Leaves rounded at the apex ..... **Ptychostomum** (p. 96)
9b. Leaves greater than 5 times as long as wide ..... **Pohlia** (p. 179)

133 - Upright growing, costa to leaf apex, leaves broadest near apex

1a. Leaves less than 5 times as long as wide 2
2a. Leaves tapered at the apex 3
3a. Margins smooth ..... **Key AC** (p. 28)
3b. Margins toothed ..... **Key AD** (p. 28)
2b. Leaves rounded at the apex 4
4a. Margins smooth ..... **Key AE** (p. 28)
4b. Margins toothed ..... **Key AF** (p. 29)
1b. Leaves greater than 5 times as long as wide 5
5a. Leaves tapered at the apex 6
6a. Margins smooth ..... **Key AG** (p. 29)
6b. Margins toothed ..... **Key AH** (p. 29)
5b. Leaves rounded at the apex 7
7a. Margins smooth ..... **Key AI** (p. 29)
7b. Margins toothed ..... **Fissidens** (p. 129)

211 - Horizontal growing, costa short or not visible, leaves broadest near base

1a. Leaves less than 5 times as long as wide 2
2a. Leaves tapered at the apex 3
3a. Margins smooth ..... **Key AJ** (p. 29)

3b. Margins toothed ..... **Key AK** (p. 30)
2b. Leaves rounded at the apex..... 4
4a. Margins smooth ..... **Key AL** (p. 31)
4b. Margins toothed ..... **Key AM** (p. 31)
1b. Leaves greater than 5 times as long as wide ..... **Pohlia** (p. 179)

212 - Horizontal growing, costa short or not visible, leaves broadest near middle

1a. Leaves tapered at the apex..... 2
2a. Margins smooth ..... **Key AN** (p. 31)
2b. Margins toothed ..... **Key AO** (p. 31)
1b. Leaves rounded at the apex..... 3
3a. Margins smooth ..... **Key AP** (p. 32)
3b. Margins toothed ..... **Key AQ** (p. 32)

221 - Horizontal growing, costa to leaf middle, leaves broadest near base

1a. Leaves less than 5 times as long as wide 2
2a. Leaves tapered at the apex..... 3
3a. Margins smooth ..... **Key AR** (p. 32)
3b. Margins toothed ..... **Key AS** (p. 33)
2b. Leaves rounded at the apex..... **Key AT** (p. 33)
1b. Leaves greater than 5 times as long as wide 4
4a. Margins smooth ..... **Sarmentynum/Drepanocladus** (p. 56/45)
4b. Margins toothed ..... **Sarmentynum/Warnstorfia** (p. 56/59)

222 - Horizontal growing, costa to leaf middle , leaves broadest near middle

1a. Leaves tapered at the apex..... 2
2a. Margins smooth ..... **Key AU** (p. 33)
2b. Margins toothed ..... **Key AV** (p. 34)
1b. Leaves rounded at the apex..... 3
3a. Margins smooth ..... **Key AW** (p. 34)
3b. Margins toothed ..... **Hageniella** (p. 240)

223 - Horizontal growing, costa to leaf middle, leaves broadest near apex

1a. Leaves tapered at the apex..... **Amblystegium** (p. 37)
1b. Leaves rounded at the apex..... **Homalia** (p. 193)

231 - Horizontal growing, costa to leaf apex, leaves broadest near base

1a. Leaves less than 5 times as long as wide 1
    2a. Leaves tapered at the apex 2
        3a. Margins smooth ..... **Key AX** (p. 34)
        3b. Margins toothed ..... **Key AY** (p. 35)
    2b. Leaves rounded at the apex ..... **Key AZ** (p. 35)
1b. Leaves greater than 5 times as long as wide, leaves tapered at apex ..... **Drepanocladus** (p. 45)

232 - Horizontal growing, costa to leaf apex, leaves broadest near middle

1a. Leaves tapered at the apex 2
    2a. Margins smooth ..... **Key BA** (p. 35)
    2b. Margins toothed ..... **Key BB** (p. 36)
1b. Leaves rounded at the apex ..... **Key BC** (p. 36)

Secondary Keys

Key A

1a. Plants small, less than 1 cm tall, leaves thin and transparent ..... **Micromitrium** (p. 127)
1b. Plants large, greater than 1 cm tall, leaves thick and opaque ..... **Polytrichastrum** (p. 207)

Key B

1a. Plants small, less than 1 cm tall ..... **Ephemerum** (p. 125)
1b. Plants large, greater than 1 cm tall 2
2a. Capsules 4(-6) angled or cylindrical, not constricted ..... **Polytrichastrum** (p. 207)
2b. Capsules constricted forming wings at angles, especially with age ..... **Polytrichum** (p. 209)

Key C

1a. Plants pale, gray-green, leaves thick and opaque, typically dry habitat ..... **Leucobryum** (p. 175)
1b. Plants green, yellow, brownish to blackish red, or red typically wetland habitat ..... **Scorpidium** (p. 57)

Key D

1a. Leaves broadly tapered to a rounded point, leaf tip erect ..... **Calliergonella** (p. 40)
1b. Leaves tapered to a sharp point, leaf tip curved ..... **Scorpidium** (p. 57)

Key E

1a. Leaves toothed singly only at the leaf tip ..... **Cryphaea** (p. 102)
1b. Leaves doubly toothed nearly to the base ..... **Mnium** (p. 183)

Key F

1a. Leaf cells smooth, visible as a shiny surface 2
2a. Plants small, found on twigs, branches, and trunks of shrubs and trees ..... **Cryphaea** (p. 102)
2b. Plants medium to large, found on terrestrial substrates primarily in wetlands ..... **Scorpidium** (p. 57)
1b. Leaf cells rough, visible as a dull surface or with magnification 3
3a. Rough surface of cells formed by upturned cells, difficult to observe even under magnification ..... **Cryphaea** (p. 102)
3b. Rough surface of cells due to papillae, a warty appearance under magnification ..... **Codriophorus** (p. 140)

Key G

1a. Stems lacking paraphyllia (small leaf-like structures along the stem) ..... **Rhytidiadelphus** (p. 152)
1b. Stems with paraphyllia (visible under magnification) 2
2a. Stems regularly (1-)2-3-pinnate (frondose), leaves tightly appressed and erect, leaf cells rough due to upturned cells ..... **Hylocomium** (p. 149)
2b. Stems remotely or irregularly branched (though sometimes 1-3 pinnate), leaves erect to squarrose, leaf cells smooth ..... **Hylocomiastrum** (p. 148)

Key H

1a. Leaf cells smooth, visible as a shiny surface 2
2a. Plants small, found on twigs, branches, and trunks of shrubs and trees ..... **Cryphaea** (p. 102)
2b. Plants medium to large, found on terrestrial substrates primarily in wetlands ..... **Scorpidium** (p. 57)
1b. Leaf cells rough, visible as a dull surface or with magnification 3
3a. Rough surface of cells formed by upturned cells, difficult to observe even under magnification ..... **Cryphaea** (p. 102)
3b. Rough surface of cells due to papillae, a warty appearance under magnification ..... **Codriophorus** (p. 140)

Key I

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Plants with a persistent filamentous protonema, recognized when sporophytes are present 3
3a. Leaves with numerous, but compact lamellae occupying the entire width of the upper surface ..... **Pogonatum** (p. 206)
3b. Leaves lacking lamellae ..... **Discelium** (p. 116)
2b. Plants with protonema not pleasant (ephemeral protonema) 4
4a. Rhizoids scattered along the stem, sometimes densely so 5
5a. Leaf cells smooth, leaves appear shiny due to reflection of light 6
6a. Leaves tapering to a long, narrow tip, often curved ..... **Dicranum/Dicranella** (p. 107/104)
6b. Leaves may taper to the apex, but the tip is usually broad ..... **Ptychostomum/Tortula** (p. 96/226)
5b. Leaf cells roughened by papillae or upturned cells, appear dull 7
7a. Leaves tapering to a long, narrow tip, often curved ..... **Dicranum/Dicranella** (p. 107/104)
7b. Leaves, though tapered to the apex, broader at the tip 8
8a. Costa typically extending beyond the leaf tip to form an awn ..... **Tortula** (p. 226)
8b. Costa typically ending below leaf tip ..... **Aulacomnium** (p. 68)
4b. Rhizoids restricted to the base of the stems 9
9a. Leaf cells smooth, leaves appear shiny due to reflection of light 10
10a. Plants of woody substrates (trees, logs, stumps) 11
11a. Typically found on tree bases and trunks 12
12a. Leaves distinctly toothed throughout 13
13a. Leaves typically ovate or elliptical, doubly toothed ..... **Mnium** (p. 183)
13b. Leaves long tapering, sometimes curved ..... **Dicranum** (p. 107)
12b. Leaves weakly toothed, or toothed near apex ..... **Ceratodon/Pohlia** (p. 117/179)
11b. Typically found on logs or stumps 14
14a. Found on logs and stumps of little or no decay 15
15a. Leaves distinctly toothed, often double ..... **Mnium** (p. 183)
15b. Leaves nor or only weakly toothed 16
16a. Leaves apices rounded to obtuse with a point ..... **Barbula** (p. 214)
16b. Leaves tapered to a point ..... **Ceratodon** (p. 117)
14b. Found on logs and stumps of advanced decay ..... **Tetraphis/Gemmabryum** (p. 263/93)
10b. Plants of other substrates (rock, soil, etc.) 17
17a. Plants of various soil substrates 18
18a. Plants small, ephemeral, capsules immersed or slightly exserted 19
19a. Capsules lacking an operculum, no neck ..... **Pleuridium/Archidium** (p. 121/66)
19b. Capsules with an operculum, upright with an inflated neck ..... **Bruchia** (p. 90)
18b. Plants various sized, perennial, capsules distinctly exserted 20
20a. Disturbed habitats (roadside, trailside, eroding banks, etc) 21
21a. Plants gray or silver green, nitrogen enriched habitats ..... **Bryum** (p. 92)

21b. Plants of various color and habitats 22
22a. Leaves with long narrowed apex, hair-like tip 23
23a. Leaves somewhat contorted when dry capsule with and elongate neck..... **Trematodon** (p. 91)
23b. Leaves little changed when dry, capsules without an elongate neck ..... **Dicranella** (p. 104)
22b. Leaves various, but not long and hairlike ..... **Barbula/Didymodon** (p. 214/215)
20b. Intact habitats with wet soils (wetlands, along streams, etc.) 24
24a. Leaves narrow and three ranked..... **Meesia** (p. 178)
24b. Leaves broader and spirally arranged ..... **Ptychostomum** (p. 96)
17b. Plants of various rock substrates 25
25a. Leaves are distinctly toothed..... 26
26a. Singly toothed, often only near apex..... **Pohlia** (p. 179)
26b. Doubly toothed, usually throughout ..... **Mnium** (p. 183)
25b. Leaves not or only weakly toothed..... 30
30a. Capsules immersed..... **Schistidium/Grimmia** (p. 143/141)
30b. Capsules exserted..... 31
31a. Restricted to rock crevices in protected sites..... **Seligeria** (p. 238)
31b. Of more exposed habitats 32
32a. Leaves with long different colored awns ..... **Grimmia/Bucklandiella** (p. 141/139)
32b. Leaves without awns..... **Ceratodon/Didymodon/Pohlia** (p. 117/215/179)
9b. Leaf cells roughened by papillae or upturned cells, appear dull 33
33a. Plants of woody substrates (trees, logs, stumps) 34
34a. Typically forming tufts or cushions on tree trunk..... **Ulota/Orthotrichum** (p. 200/197)
34b. Typically found on logs or stumps 35
35a. Leaves plane or keeled with acute apex..... **Trichostomum** (p. 229)
35b. Leaves apices rounded to obtuse with a point, on stumps ..... **Barbula** (p. 214)
33b. Plants of other substrates (rock, soil, etc.) 36
36a. Plants of various soil substrates..... 37
37a. Plants of disturbed habitats (lawns, trails, etc.) 38
38a. Seta short (<0.5 cm)..... **Weissia/Pleuridium** (p. 230/121)
38b. Seta longer (>0.5 cm)..... **Barbula/Didymodon** (p. 214/215)
37b. Plants of more intact habitats ..... **Trichostomum** (p. 229)
36b. Plants of various rock substrate (includes concrete)..... 39
39a. Capsules immersed to emergent 40
40a. Capsules without lids..... **Weissia** (p. 230)
40b. Capsules with lids ..... **Schistidium/Grimmia/Weissia** (p. 143/141/230)
39b. Capsules distinctly exserted 41
41a. Leaves with long different colored awns..... **Grimmia/Bucklandiella** (p. 141/139)
41b. Leaves without awns 42
42a. Plants of moist/wet rock surfaces 43
43a. Leaf tips rounded or broad..... **Gymnostomum/Didymodon** (p. 219/215)
43b. Leaf tips distinctly acute..... **Trichostomum** (p. 229)
42b. Plants of drier rock surfaces..... 44
44a. Leaf apex acute or acuminate (occasionally narrowly obtuse)..... **Orthotrichum/Ulota** (p. 197/200)
44b. Leaf apex rounded to obtusely acute..... **Barbula** (p. 214)

Key J

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Rhizoids restricted to the base of the stem 3
3a. Leaves with lamellae thickening the costa or leaves 4
4a. Plants arising from a persistent protonema ..... **Pogonatum** (p. 206)
4b. Plants without a persistent protonema 5
5a. Much of the leaf thickened by lamellae, leaves opaque ..... **Polytrichastrum/Polytrichum** (p. 207/209)
5b. Only the costa thickened by lamellae, lamina translucent ..... **Atrichum** (p. 204)
3b. Leaves lacking the lamellae 6
6a.Plants small, ephemeral, and typically of mineral soil ..... **Pleuridium** (p. 121)
6b. Plants small to large, perennial, from various substrates 7
7a.Plants typically of various rock substrate 8
8a. Plants small and olive green of crevices and protected areas ..... **Seligeria** (p. 238)
8b. Plants larger of various habitats ..... **Grimmia/Schistidium/Bucklandiella** (p. 141/143/139)
7b. Plants of various substrates (soil, rock, tree bases, etc) 9
9a. Leaves entire ..... **Pohlia** (p. 179)
9b. Leaves variously toothed, sometimes only at the tip 10
10a. Leaves with differentiated margins 11
11a. Leaves with double teeth ..... **Mnium** (p. 183)
11b. Leaves with single teeth ..... **Pohlia** (p. 179)
10b. Leaves without a differentiated margin, though recurved ..... **Ceratodon** (p. 117)
2b. Rhizoids variously along the stem 12
12a. Plants of moist to wet habitats 13
13a. Leaf cells roughened by papillae or upturned cell ends 14
14a. Leaves erect-spreading and not contorted when dry ..... **Philonotis** (p. 70)
14b. Leaves straight, slightly undulate, contorted or crisped when dry ..... **Dichodontium/Dicranum** (p. 103/107)
13b. Leaf cells smooth (appearing shiny under magnification) 15
15a. Plants of various colors, leaves ovate, ovate-lanceolate ..... **Ptychostomum** (p. 96)
15b. Plants green or yellowish, leaves lanceolate with long subula ..... **Dicranum** (p. 107)
12b. Plants of drier habitats and substrates ..... **Dicranum/Dicranella** (p. 107/104)

Key K

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Leaf cells smooth, leaves appear shiny due to reflection of light 3
3a. Leaf margins entire ..... **Tortula** (p. 226)
3b. Leaf margins toothed 4
4a. Leaf margin distinctly differentiated in 1-3 rows, sometimes multiple layers marginal teeth sharp and often paired ..... **Mnium** (p. 183)
4b. Leaf margin indistinctly differentiate, marginal teeth single and indistinct ..... **Ptychostomum** (p. 96)
2b. Leaf cells rough with papillae, leaves appear dull 5
5a. Leaves rounded to apiculate, costa does not extend into an awn ..... **Barbula** (p. 214)
5b. Leaves with a costa extending into a short to long awn ..... **Tortula** (p. 226)

Key L

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Leaf margin distinctly differentiated in 1-3 rows, sometimes multiple layers marginal teeth sharp and often paired ..... **Mnium** (p. 183)
2b. Leaf margin indistinctly differentiate, marginal teeth single and indistinct ..... **Ptychostomum** (p. 96)

Key M

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Plants of upland habitats 3
3a. Plants of tree, stumps and logs 4
4a. Plants of tree bases and trunks 5
5a. Plants with a differentiated leaf margin ..... **Pohlia** (p. 179)
5b. Plants without a differentiated leaf margin 6
6a. Rhizoids often found at the bases of leaves or scattered along the stem ..... **Dicranum** (p. 107)
6b. Rhizoids typically limited to the base of the stems 7
7a. Plants typically forming rounded cushions ..... **Ulota** (p. 200)
7b. Plants typically forming tufts, but not typically cushions ..... **Tortella** (p. 224)
4b. Plants of logs and stumps 8
8a. Plants with a differentiated leaf margin ..... **Pohlia** (p. 179)
8b. Plants without a differentiated leaf margin 9
9a. Leaves are thickened (not translucent) due to lamellae ..... **Polytrichum** (p. 209)
9b. Leaves translucent 10
10a. Rhizoids abundant along the stem ..... **Dicranum** (p. 107)
10b. Rhizoids restricted to stem base ..... **Trichostomum/Leptobryum/Tortella** (p. 229/177/224)
3b. Plants of rock and soil 11
11a. Rhizoids located along the stems, often forming a tomentum 12
12a. Rhizoids at the base of leaves and stems ..... **Dicranella** (p. 104)
12b. Rhizoids forming a tomentum 13
13a. Leaves are thickened (not translucent) due to lamellae ..... **Polytrichum** (p. 209)
13b. Leaves translucent ..... **Dicranum** (p. 107)
11b. Rhizoids restricted to the base of stems 14
14a. Plants of soil substrates 15
15a. Plants small, typically less than 1 cm 16
16a. Capsules immersed or slightly emergent 17
17a. Capsules lack lids ..... **Weissia/Pleuridium** (p. 230/121)
17b. Capsules with lids ..... **Weissia/Bruchia** (p. 230/90)
16b. Capsules distinctly exserted 18
18a. Neck of the capsule is obvious 19
19a. Capsules pear-shaped, cylindric, or urn-shaped ..... **Pohlia/Leptobryum** (p. 177/179)
19b. Neck is one to three times as long as the urn ..... **Trematodon** (p. 91)
18b. Neck of capsule not noticeably differentiated 20
20a. Leaves are rigid to flexuose or curved when dry ..... **Ditrichum** (p. 119)
20b. Leaves crisped to incurved when dry ..... **Tortella** (p. 224)
15b. Plants larger, typically greater than 1 cm 21
21a. Leaves thickened by lamellae (not translucent) ..... **Polytrichum** (p. 209)

21b. Leaves translucent (no lamellae) 22
22a. Leaves long, narrow, and hairlike 23
23a. Capsules pear-shaped due to an swollen neck ..... **Leptobryum** (p. 177)
23b. Capsules cylindric, with undifferentiated neck ..... **Ditrichum** (p. 119)
22b. Leaves broader, not hairlike 24
24a. Leaf margins differentiated ..... **Pohlia** (p. 179)
24b. Leaf margins undifferentiated ..... **Tortella/Trichostomum** (p. 224/229)
14b. Plants of rock substrates 25
25a. Leaves typically ending in a short to long awn ..... **Bucklandiella** (p. 139)
25b. Leaves not ending in an awn 26
26a. Leaf margins revolute at least near the leaf tip 27
27a. Leaves with differentiated border ..... **Pohlia** (p. 179)
27b. Leaves border undifferentiated ..... **Rhabdoweisia** (p. 114)
26b. Leaf margins otherwise 27
28a. Leaf margins incurved ..... **Weissia/Tortella** (p. 230/222)
28b. Leaf margins plane or erect 29
29a. Leaves not crisped and only slightly altered when dry 30
30a. Plants very small and olive green ..... **Seligeria** (p. 238)
30b. Plants larger and various color ..... **Ulota/Leptobryum/Ditrichum/Trichostomum** (p. 200/177/119/229)
29b. Leaves crisped or obviously altered when dry 31
31a. Plants very small and yellowish green ..... **Campylostelium/Pohlia** (p. 234/179)
31b. Plants larger and of various colors 32
32a. Leaves entire ..... **Ulota/Tortella/Amphidium/Pohlia** (p. 200/224/195/179)
32b. Leaves toothed ..... **Amphidium/Pohlia** (p. 195/179)
2b. Plants of wetland habitats 33
33a. Plants of woody substrates 34
34a. Rhizoids restricted to the base of stems 35
35a. Leaves thickened by lamellae ..... **Polytrichum** (p. 209)
35b. Leaves translucent, lack lamellae ..... **Tortella/Pohlia** (p. 224/179)
34b. Rhizoids located at various points along the stem 36
36a. Leaves thickened by lamellae ..... **Polytrichum** (p. 209)
36b. Leaves translucent, lace of lamellae ..... **Dicranum/Dichelyma** (p. 107/133)
33b. Plants of soil or rock substrates 37
37a. Rhizoids restricted to the base of stems 38
38a. Leaves thickened by lamellae ..... **Polytrichum** (p. 209)
38b. Leaves translucent, lack lamellae 39
39a. Leaf margin recurved to revolute ..... **Bucklandiella/Bryoerythrophyllum** (p. 139/216)
39b. Leaf margins plane to incuved ..... **Tortella/Pohlia/Pleuridium** (p. 224/179/121)
37b. Rhizoids located at various points along the stem 40
40a. Leaves thickened by lamellae ..... **Polytrichum** (p. 209)
40b. Leaves translucent, lack lamellae ..... **Dicranum/Dichelyma/Cleistocarpidium** (p. 107/133/118)

Key N

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Plants obvious star-like viewed from above when wet, may form cushions or turfs 3
3a. Leaf cells roughened or noticeably swollen (dull appearance) 4
4a. Forming large, loose cushions, capsules ovoid or pear-shaped ..... **Bartramia** (p. 69)

4b. Forming tight to loose turfs, capsules ovate to oblong-cylindric ..... **Timmia** (p. 272)
3b. Leaf cells typically smooth (shiny appearance), capsules cylindric or more often 4-6 angled 5
5a. Hypophysis disc-shaped and separated by a deep constriction from urn .....**Polytrichum** (p. 209)
5b. Hypophysis may be obvious, bu not sharply separated from urn ..... **Polytrichastrum** (p. 207)
2b. Plants without a star-like appearance from above 6
6a. Plants typically standing less than 1 cm tall 7
7a. Found growing on various soil types 8
8a. Stems with rhizoids along the stem, found in sand .....**Campylopus** (p. 173)
8b. Stems with rhizoids restricted to the base 9
9a. Plants ephemeral, found in the spring, capsules immersed and lacking opercula 10
10a. Plants found with a persistent protonema .....**Ephemerum** (p. 125)
10b. Plants lacking a persistent protonema .....**Pleuridium** (p. 121)
9b. Plants persistent found through the year 11
11a. Leaves long, narrow, awl-shaped, subtubulose, keeled and often curved..... **Dicranum/Ditrichum** (p. 107/119)
11b. Leaves otherwise ..... **Pohlia** (p. 179)
7b. Found growing on substrates other than soil 12
12a. Found on rock 13
13a. Plants olive green, leaves erect spreading to spreading recurved when moist.....**Seligeria** (p. 238)
13b. Plants of various colors, leaves various 14
14a. Leaves long, narrow, awl-shaped, subtubulose, keeled and often curved.....**Dicranum** (p. 107)
14b. Leaves otherwise ..... **Pohlia** (p. 179)
12b. Found growing on wood 15
15a. Leaves long, narrow, awl-shaped, subtubulose, keeled and often curved.....**Dicranum** (p. 107)
15b. Leaves otherwise ..... **Pohlia** (p. 179)
6b. Plants typically standing greater than 1 cm tall 16
16a. Plants of upland habitats, wet or dry 17
17a. Rhizoids limited to the base of the stem 18
18a. Plants found on rock ..... **Bucklandiella/Pohlia** (p. 139/179)
18b. Plants found on soil or wood .....**Ditrichum/Pohlia** (p. 119/179)
17b. Rhizoids variously located along the stem..... **Dichodontium/Dicranella** (p. 103/104)
16b. Plants of wetlands and riparian habitats, typically wet or submerged 19
19a. Rhizoids limited to the base of the stem .....**Bucklandiella** (p. 139)
19b. Rhizoids variously located along the stem.....20
20a. Submerged or subject to regular flooding 21
21a. Shaggy glossy plants, attached to various substrates..... **Dichelyma** (p. 133)
21b. Plants glossy or dull, green to yellow-brown, dense tufts.....**Oncophorus** (p. 236)
20b. Plants in wet habitats, but rarely subjected to flooding.....22
22a. Leaves straight and slightly undulate, erect spreading to squarrose from an erect base when wet..... **Dichodontium** (p. 103)
22b. Leaves otherwise 23
23a. Leaves long, lanceolate tapering from a broad base, sometimes forming a awl-like leaf tip, leaves often turned in a single direction .....**Dicranum** (p. 107)
23b. Leaves less than 4 mm, erect to spreading ..... **Pohlia** (p. 179)

Key O

1a. Plants found primarily on soils (occasionally on other substrates) 2
2a. Plants whitish green or gray green when dry in large dense cushions ..... **Leucobryum** (p. 175)
2b. Plants of various colors, but not whitish or grayish green 3
3a. Capsules greater typically cylindrical or pear-shaped and greater than 2 cm 4
4a. Cells at the leaf margins are differentiated ..... **Ptychostomum/Gemmabryum** (p. 96/93)
4b. Cells at the leaf margins not differentiated ..... **Gemmabryum/Pohlia** (p. 93/179)
3b. Capsules various, but usually less than 2 cm long, mineral soils 5
5a. Leaves long and narrowed and often turned in one direction ..... **Dicranella** (p. 104)
5b. Leaves various, but not narrowed to a long hair-like tip ..... **Didymodon** (p. 215)
1b. Plants found primarily on rock or trees 5
5a. Plants on trees ..... **Ulota** (p. 200)
5b. Plant on rocks 6
6a. Capsules immersed ..... **Schistidium/Grimmia** (p. 143/141)
6b. Capsules exserted 7
7a. Substrate acidic rock 8
8a. Capsule regularly present, often 8 plicate or 8-ribbed ..... **Ulota** (p. 200)
8b. Capsules rarely present, often smoothed ..... **Bucklandiella/Codriophorus/Grimmia** (p. 139/140/141)
7b. Substrate basic rock (limestone or calcareous) 9
9a. Plants small and light green in color ..... **Didymodon** (p. 215)
9b. Plants usually dark green in color ..... **Grimmia/Codriophorus/Hymenostylium** (p. 141/140/220)

Key P

1a. Plants tree-like (dendroid) with upright primary or secondary stems with branches near apex 2
2a. Stems flattened in cross-section, often on stone ..... **Thamnobryum** (p. 264)
2b. Branching spirally arranged in the upper portions of the stem, often on soil 3
3a. Stems erect, distinctly tree-like, leaves erect ..... **Climacium** (p. 101)
3b. Stems prostrate to erect, leaves pleated, shaggy and weakly dendroid, leaves wide-spreading ..... **Rhytidiadelphus** (p. 152)
1b. Plants of various forms, but not dendroid 4
4a. Plants of soil 5
5a. Stems are covered in rhizoids, at least the lower stem 6
6a. Plants acrocarpous and branched or not 7
7a. Cells smooth (appearing shiny under low magnification) 8
8a. Leaves narrowed to a long point, not much changed when dry ..... **Plagiopus** (p. 72)
8b. Leaves broader, contorted when dry ..... **Ptychostomum** (p. 96)
7b. Cells roughened (appearing dull under low magnification) ..... **Philonotis** (p. 70)
6b. Plants pleurocarpous (upright), pinnately or irregularly branched ..... **Cratoneuron** (p. 44)
5b. Stems without rhizoids along the stem (may be found at the base of stems or branches) 9
9a. Leaves contorted or otherwise altered when dry 10
10a. Plants typically bluish green and relatively small ..... **Saelania** (p. 122)
10b. Plants not bluish green, plant of various sizes ..... **Pohlia/Ptychostomum** (p. 179/96)
9b. Leaves little changed when dry ..... **Dicranella** (p. 104)
4b. Plants of rock 11
11a. Stems are covered in rhizoids, at least the lower stem 12
6a. Plants acrocarpous and branched or not 7
7a. Cells smooth (appearing shiny under low magnification) 8
8a. Leaves narrowed to a long point, not much changed when dry ..... **Plagiopus** (p. 72)
8b. Leaves broader, contorted when dry ..... **Ptychostomum** (p. 96)
7b. Cells roughened (appearing dull under low magnification) ..... **Philonotis** (p. 70)
6b. Plants pleurocarpous (upright), pinnately or irregularly branched ..... **Cratoneuron** (p. 44)

11b. Stems without rhizoids along the stem (may be found at the base of stems or branches) 12
12a. Leaves contorted or otherwise altered when dry ..... **Pohlia/Ptychostomum** (p. 179/96)
12b. Leaves crisped or twisted when dry, but not contorted 13
13a. Capsules immersed ..... **Grimmia/Schistidium** (p. 141/143)
13b. Capsules exserted ..... **Grimmia/Bucklandiella** (p. 141/139)

Key Q

1a. Leaf cells smooth, visible as a shiny surface 2
2a. Leaf margins indistinctly differentiated, marginal teeth single and indistinct ..... **Ptychostomum** (p. 96)
2b. Leaf margins undifferentiated and entire, plants large ..... **Calliergon** (p. 39)
1b. Leaf cells rough, visible as a dull surface or with magnification ..... **Codriophorus** (p. 140)

Key R

1a. Plants relatively small, less than 4 cm tall 2
2a. Found growing on soil 3
3a. Leaves erect and curved, sporophytes short and slender ..... **Dicranella** (p. 104)
3a. Leaves not elongate and curved, sporophytes long and robust ..... **Pohlia** (p. 179)
2b. Found growing on other substrates 4
4a. Forms small cushions on trunks and branches of trees and shrubs ..... **Ulota** (p. 200)
4b. Grows on rock (though may be found on wood) 5
5a. Leaves spreading when moist, older plant parts rusty or brick red in color ..... **Bryoerythrophyllum** (p. 216)
5b. Leaves erect spreading to recurved when moist 6
6a. Margins recurved to revolute ..... **Bucklandiella** (p. 139)
6b. Margins plane ..... **Pohlia** (p. 179)
1b. Plants larger, greater than 4 cm tall 7
7a. Margins recurved to revolute ..... **Bucklandiella** (p. 139)
7b. Margins plane ..... **Pohlia** (p. 179)

Key S

1a. Found growing on soil 2
2a. Leaves erect, cost extending in an awn or long hair-like tip 3
3a. Underside of leaf with ridges, gray-green or whitish-green ..... **Paraleucobryum** (p. 113)
3b. No distinct ridges on the underside of the leaves 4
4a. Plants typically slender, 0.4 to 4 cm ,sporophytes often present ..... **Dicranella** (p. 104)
4b. Plants more robust, only about 1 cm, sporophytes unknown ..... **Campylopus** (p. 173)
2b. Costa not extending beyond leaf tip, sporophytes relatively robust ..... **Pohlia** (p. 179)
1b. Found growing on other substrates 5
5a. Found growing on rotten wood, stumps, trees and shrubs ..... **Paraleucobryum** (p. 113)
5b. Found growing on rock 6
6a. Margins recurved to revolute ..... **Bucklandiella** (p. 139)
6b. Margins plane ..... **Pohlia** (p. 179)

Key T

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Plants growing on animal dung, hypophysis wider than urn ..... **Splachnum** (p. 261)

2b. Plants growing on other substrates, capsules variable 4
4a. Capsules immersed 5
5a. Plants of rock substrate (rarely mineral soil) ..... **Schistidium** (p. 141)
5b. Plants of various soil substrates 6
6a. Plants tiny, stems less than 0.5 mm and bulb-shaped ..... **Acaulon** (p. 212)
6b. Plants small, stems 3 – 7 mm, simple or branched ..... **Pleuridium** (p. 121)
4b. Capsule exserted 7
7a. Margins differentiated 8
8a. Margins thickened and toothed, often double toothed ..... **Mnium** (p. 183)
8b. Margins weakly differentiated, may be entire or toothed near the apex ..... **Ptychostomum** (p. 96)
7b. Margins not distinctly differentiated 9
9. Plants ephemeral, typically nutrient enriched sites, seta flexuose, capsules asymmetric and pyriforme ..... **Funaria** (p. 137)
9. Plants perennial in various sites 10
10a. Costa distinct and prominent on the lower side of the leaf ..... **Hyophila** (p. 221)
10b. Costa distinct, but not bulging on either surface ..... **Pohlia/Imbribryum** (p. 179/95)

Key U

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Plants growing on animal dung, hypophysis wider than urn 3
3a. Plants growing on decomposing herbivore dung in wetlands ..... **Splachnum** (p. 261)
3b. Plants growing on carnivore dung, old bones, and owl pellets ..... **Tetraplodon** (p. 262)
2b. Plants growing on other substrates, capsules variable 4
4a. Capsules immersed 5
5a. Plants of rock substrate (rarely mineral soil) ..... **Schistidium** (p. 143)
5b. Plants of various soil substrates 6
6a. Plants tiny, stems less than 0.5 mm and bulb-shaped ..... **Acaulon** (p. 212)
6b. Plants small, stems 3 – 7 mm, simple or branched ..... **Pleuridium** (p. 121)
4b. Capsule exserted 7
7a. Margins differentiated 8
8a. Margins thickened and toothed, often double toothed ..... **Mnium** (p. 183)
8b. Margins weakly differentiated, may be entire or toothed near the apex ..... **Ptychostomum** (p. 96)
7b. Margins not distinctly differentiated ..... **Pohlia** (p. 179)

Key V

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Leaves strap-like, dark green, plants forming extensive patches along trails and soil banks and recognized by large capsule borne among the leaves ..... **Diphyscium** (p. 115)
2b. Plants not as above, capsules borne on a seta 3
3a. Plants found in rock crevices and ledges 4
4a. Forms small patches, costa rarely reaches the rounded or acute apex ..... **Encalypta** (p. 123)
4b. Forms small to large patches, costa extends to or beyond apex ..... **Tortula/Syntrichia** (p. 226/222)
3b. Plants typically growing on various moist soils 5
5a. Leaves typically large (> 5 mm), plants of wet areas forming loose turfs ..... **Rhizomnium/Pseudobryum** (p. 189/190)

5b. Leaves typically smaller (< 5 mm), plants of various habitats, dense turfs ..... **Ptychostomum** (p. 96)

Key W

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Leaf margin differentiated, maybe only weakly 3
3a. Margins distinctly differentiated, often different color 4
4a. Two growth forms, prostrate sterile stems and erect fertile stems, margins with single teeth ..... **Plagiomnium** (p. 185)
4b. One growth form, erect stems, marginal teeth double ..... **Mnium** (p. 183)
3b. Margins only weakly differentiated ..... **Ptychostomum** (p. 96)
2b. Leaf margins undifferentiated 5
5a. Cells smooth, irregularly toothed, stems subcomplanate ..... **Arrhenopterum** (p. 67)
5b. Cells roughened by papillae, usually pluripapillose ..... **Syntrichia** (p. 222)

Key X

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Plants short, less than 1 cm tall, capsules immersed ..... **Pleuridium** (p. 121)
2b. Plants typically 1 cm or taller, capsules exserted 3
3a. Found growing on damp shaded cliffs, capsules ovoid to oblong cylindric, when dry contracted below the mouth and deeply 8-furrowed ..... **Rhabdoweisia** (p. 114)
3b. Found growing on soil, logs, tree bases, humus, and crevices in rock, along paths and roads, in disturbed places, capsules cylindric, pyriforme, or urceolate ..... **Pohlia** (p. 179)

Key Y

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, though often curling as they dry, stems feather-like ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Plants short, less than 1 cm tall, capsules immersed 3
3a. Bud-like plants, no stems, less than 3 mm tall growing in disturbed moist or drying soil capsules spherical ..... **Ephemerum** (p. 125)
3b. Plants taller, stems 3 to 7 mm tall, branched or unbranched growing on moist sandy soil capsules ovoid to elliptical ..... **Pleuridium** (p. 121)
2b. Plants typically 1 cm or taller, capsules exserted ..... **Pohlia** (p. 179)

Key Z

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, stems feather-like, capsules held aloft on setae ..... **Fissidens** (p. 129)
1b. Leaves not as above, capsules relatively large and sessile ..... **Diphyscium** (p. 115)

Key AA

1a. Forming dense cushions on wet or dry rock, capsules immersed ..... **Schistidium** (p. 143)
1b. Forming dense or loose turfs on various substrates including rock, leaves typically twisted and contorted when dry, capsules exserted 2
2a. Margins differentiated, though weakly, stems with rhizoids ..... **Ptychostomum** (p. 96)

2b. Margins undifferentiated ..... **Pohlia** (p. 179)

Key AB

1a. Plants dendroid, with primary stems creeping and secondary stems erect or ascending, unbranched below, freely branched above ..... **Thamnobryum** (p. 264)
1b. Plants not dendroid 2
2a. Forming dense cushions on wet or dry rock, capsules immersed ..... **Schistidium** (p. 143)
2b. Forming dense or loose turfs on various substrates including rock, leaves typically twisted and contorted when dry, capsules exserted greatly 3
3a. Margins differentiated, though weakly 4
4a. Small to large stems, stems with rhizoids, no rosulate innovations ..... **Ptychostomum** (p. 96)
4b. Small stems with rosulate innovations (sometimes 2 or more), margin distinctly bordered and serrulate found on soil or rotting wood ..... **Rosulabryum** (p. 99)
3b. Margins undifferentiated ..... **Pohlia** (p. 179)

Key AC

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, stems feather-like, capsules held aloft on setae ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Plant typically less than 1 cm tall 3
3a. Plants minute, less than 2 mm tall, capsule immersed ..... **Acaulon** (p. 212)
3b. Plants larger 4
4a. Leaves erect spreading or appressed when dry, capsules ovoid to to elliptical, immersed ..... **Pleuridium** (p. 121)
4b. Leaves crispate to contorted when dry, capsules asymmetric, ovoid-pyriform or pyriform, exserted ..... **Funaria** (p. 137)
2b. Plants typically greater than 2 cm tall, margin differentiated, leaves toothed ..... **Mnium** (p. 183)

Key AD

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, stems feather-like, capsules held aloft on setae ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Plant typically less than 2 cm tall 3
3a. Plants minute, less than 2 mm tall ..... **Acaulon** (p. 212)
3b. Plants larger 4
4a. Leaf cells roughened by multiple papillae (dull appearance) ..... **Hyophila** (p. 221)
4b. Leaf cells smooth (shiny appearance) 5
5a. Leaves erect spreading or appressed when dry, capsules ovoid to to elliptical, immersed ..... **Pleuridium** (p. 121)
5b. Leaves crispate to contorted when dry, capsules globose-pyriform or cupulate, immersed or exserted ..... **Physcomitrium** (p. 138)
2b. Plants typically greater than 2 cm tall 6
6a. Bare stems with a rosette of leaves at the stem tip (palm tree-like) ..... **Rhodobryum** (p. 98)
6b. Leaves along stem, not in a rosette at the tip ..... **Mnium** (p. 183)

Key AE

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, stems feather-like, capsules held aloft on setae ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Plants small (less than 0.5 cm), capsules often present, sessile ..... **Diphyscium** (p. 115)
2b. Plants larger, capsules when present held aloft a seta 3

3a. Leaf margins undifferentiated and smooth ..... **Encalypta** (p. 123)
3b. Leaf margins differentiated and toothed (teeth double) ..... **Mnium** (p. 183)

Key AF

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, stems feather-like, capsules held aloft on setae ..... **Fissidens** (p. 129)
1b. Leaves variously arranged, but not as above 2
2a. Plants of two forms, erect fertile stems and horizontal to arching sterile stems often in the same colony, teeth when present single ..... **Plagiomnium** (p. 185)
2b. Plants only erect, teeth double ..... **Mnium** (p. 183)

Key AG

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, stems feather-like, capsules held aloft on setae ..... **Fissidens** (p. 129)
1b. Leaves arranged spirally, capsules hidden among the leaves to shortly beyond 2
2a. Plants dark green to black, on stone, capsule opening along 4 slits ..... **Andreaea** (p. 60)
2b. Plants bright green, on soil, capsules hidden among leaves, no operculum ..... **Pleuridium** (p. 121)

Key AH

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, stems feather-like, capsules held aloft on setae ..... **Fissidens** (p. 129)
1b. Leaves arranged spirally, capsules hidden among the leaves ..... **Pleuridium** (p. 121)

Key AI

1a. Leaves two-ranked, and rigid due to overlapping leaves and vaginant laminae, stems feather-like, capsules held aloft on setae ..... **Fissidens** (p. 129)
1b. Leaves not as above, capsules relatively large and sessile ..... **Diphyscium** (p. 115)

Key AJ

1a. Plants submerged to emergent, in moving or still 2
2a. Still waters such as pools and lakes, leaves concave, often reddish, yellowish, or brownish **Scorpidium** (p. 129)
2b. Moving waters (occasionally still waters), stems typically wiry, dark green 3
3a. Plants large and attached at base of stem ..... **Fontinalis** (p. 134)
3b. Plants smaller and attach along most of stem ..... **Hygrohypnum** (p. 48)
1b. Terrestrial habitats on various substrates 4
4a. Leaf cells variously roughened, often making plants appear dull 5
5a. Plants on bare rock substrates, gray green ..... **Hedwigia** (p. 145)
5b. Plants on tree trunks often forming J-shaped growth patterns, brownish green ..... **Leucodon** (p. 176)
4b. Leaf cells smooth, often making plants appear shiny 6
6a. Rhizoids are found along the stem, typically arising at or below leaf insertion, rarely forming a dense felted covering ..... **Platydictya** (p. 51)
6b. Rhizoid typically restricted to the base of the stem 7
7a. Stems and/or branches ascending or erect 8
8a. Plants of tree trunks 9
9a. Plants forming shelf-like growths from tree trunks, leaves wavy ..... **Neckera** (p. 194)
9b. Plants forming mats with ascending branches 10
10a. Plants dark, dirty green, with ascending branches often with brood branches clustered in the upper leaves ..... **Platygyrium** (p. 162)
10b. Plants green to light green, with branches forming J-shaped growth ..... **Pylaisia** (p. 165)
8b. Plants of various substrates including tree bases 11

11a. Plants quite large, stems often ascending, but occasionally creeping, red stem visible through wet leaves, can form extensive mats .... **Pleurozium** (p. 151)
11b. Plants smaller, forming relatively small mats 12
12a. Plants often glossy, foliate stems flattened or rounded in cross-section, leaves overlapping when wet ..... **Plagiothecium** (p. 202)
12b. Plants not noticeably glossy, leaves wide spreading to squarrose, rhizoids along stems ..... **Campylium** (p. 42)
7b. Stems and/or branches prostrate 13
13a. Foliate stems somewhat flattened in cross-section 14
14a. Plants of wet habitats ..... **Sematophyllum/Isopterygium** (p. 242/161)
(See also **Callicladium, Brotherella, Isopterygiopsis**)
14b. Plants of drier habitats ..... **Callicladium/Brotherella** (p. 153/239)
(See also **Isopterygium, Isopterygiopsis, Sematophyllum**)
13b. Foliate stems not flattened in cross-section ..... **Homomallium** (p. 156)
(See also **Callicladium, Sematophyllum, Isopterygium, Isopterygiopsis**)

Key AK

1a. Leaf cells variously roughened, often making the plants appear dull 2
2a. Plants glaucous, blue-green with reddish-brown rhizoids often forming a felted layer on the stems ..... **Thelia** (p. 265)
2b. Plants various colored, lacking a dense felted layer of rhizoids along stem 3
3a. Stems or branches ascending, raising plants above substrate 4
4a. Plants often grayish or hoary, white leaf tips, on rock or similar substrate ..... **Hedwigia** (p. 145)
4b. Plants smaller, dark olive green, bases of hardwoods and on rock ..... **Schwetskeopsis** (p. 192)
3b. Stem or branches prostrate 5
5a. Stems regularly branched, pinnate or subpinnate ..... **Ctenidium** (p. 154)
5b. Stems irregularly branched or simple 6
6a. Leaves round to ovate in shape and distinctly roughened ..... **Myurella** (p. 232)
6b. Leaves are variously lanceolate in shape, only lightly roughened ..... **Taxiphyllum/Pseudotaxiphyllum** (p. 166/163)
1b. Leaf cells smooth, often making the plants appear shiny 7
7a. Plants submerged in flowing or occasionally stagnant water ..... **Fontinalis** (p. 134)
7b. Plants of dry to wet habitats but not submerged 8
8a. Stems and/or branches ascending or erect, rising above substrate 9
9a. Plants of vertical substrates such as rock cliffs and tree trunks 10
10a. Plants forming shelf-like growth out from substrate, leaves wavy ..... **Neckera** (p. 194)
10b. Plants with branch tips curving out from substrate, not wavy ..... **Pylaisia** (p. 165)
9b. Plants of non-vertical substrates 11
11a. Plants of bare rock and rock-like substrates, gray-green, leaves appressed when dry ..... **Hedwigia** (p. 145)
11b. Plants of soil and wood substrates 12
12a. Plants regularly branched, pinnate, feather-like, leaves highly curved, and stems hooked at apices ..... **Ptilium** (p. 164)
12b. Plants irregularly branched, shaggy in appearances, leaves are spreading to squarrose, not curved ..... **Loeskeobryum** (p. 150)
8b. Stems and/or branches prostrate, closely associated with substrate 13
13a. Rhizoids located along the stem at or below leaf insertion, rarely forming a dense felted layer along the stem 14
14a. Plants very small, leaves lacking a costa (short, double, indistinct) ..... **Platydictya** (p. 51)
14b. Plants small, costa distinct, single and reaching mid-leaf ..... **Campylophyllum** (p. 43)
13b. Rhizoids typically restricted to the stem base 15
15a. Leaves curved toward the lower side of the stem, may be flattened 16

16a. Stems flattened, on organic substrate (humus, rotting wood) ..... **Brotherella** (p. 239)
16b. Stems not flattened, on wood (rock and tree bases) ..... **Pylaisiadelpha** (p. 242)
15b. Leaves not curved toward the lower side of the stem 17
17a. Foliate stems flattened, small or more extensive mats 18
18a. Plants of swamps and coniferous woods ..... **Taxiphyllum** (p. 166)
(See also **Isopterygium, Herzogiella, Pseudotaxiphyllum, Entodon**)
18b. Plants of deciduous forests ..... **Entodon** (p. 124)
(See also **Isopterygium, Herzogiella, Pseudotaxiphyllum, Taxiphyllum**)
17b. Foliate stems rounded in cross-section ..... **Entodon/Taxiphyllum** (p. 124/166)

Key AL

1a. Submerged to emergent, typically in moving water 2
2a. Stems typically prostrate and closely associated with rock substrate, may be submerged or on wet rocks near the moving water ..... **Hygrohypnum** (p. 48)
2b. Stems typically long and wiry, attached at the base, remainders floating in the current ..... **Fontinalis** (p. 134)
1b. Submerged or emergent, associated with calm waters (pools, lakes, wetlands) ..... **Scorpidium** (p. 57)

Key AM

1a. Submerged to emergent, typically in moving water, stems typically long and wiry, attached at the base, remainder floating in the current ..... **Fontinalis** (p. 134)
1b. Various habitats on various substrates 2
2a. Plump worm-like shoots, pale green to glaucous green, leaves cupped due to erect leaf margins, leaves roughed by papillae or upturned cells ..... **Myurella** (p. 232)
2b. Stems creeping, typically shiny, cells smooth, branches terete or complanate ..... **Entodon** (p. 124)

Key AN

1a. Submerged to emergent, typically in moving water 2
2a. Associated with flowing water 3
3a. Stems typically prostrate and closely associated with rock substrate, may be submerged or on wet rocks near the moving water ..... **Hygrohypnum (**p. 48)
3b. Stems typically long and wiry, attached at the base, remainder floating in the current ..... **Fontinalis (**p. 134)
2b. Associated with still water habitats (lakes and pools), wetlands ..... **Scorpidium** (p. 57)
1b. Terrestrial habitats on various substrates 4
4a. Found growing over soil, rocks, and a the base of trees 5
5a. Stems creeping, typically shiny, branches terete or complanata ..... **Entodon** (p. 124)
5b. Stems creeping, often ascending, feathery, stems red and often quite obvious through wet leaves, margins incurved to leaf tips ..... **Pleurozium** (p. 151)
4b. Found on the trunks of trees or rarely cliffs and boulders recognized by its branched J-shaped growth form ..... **Forstroemia** (p. 167)

Key AO

1a. Submerged to emergent, typically in moving water ..... **Fontinalis** (p. 134)
1b. Terrestrial habitats on various substrates 2
2a. Pendent to prostrate mats, leaf margins narrowly reflexed below, leaf surface roughed by upturned cells ..... **Pterigynandrum** (p. 233)
2b. Plump worm-like shoots, pale green to glaucous green, leaves cupped due to erect leaf margins, leaves roughed by papillae or upturned cells ..... **Myurella** (p. 232)

Key AP

1a. Typically found growing submerged or on wet rocks 2
2a. Associated with moving water 3
3a. Stems typically prostrate and closely associated with rock substrate, may be submerged or on wet rocks near the moving water ..... **Hygrohypnum** (p. 48)
3b. Stems typically long and wiry, attached at the base, remainders floating in the current ..... **Fontinalis** (p. 134)
2b. Associated with still water, submerged, usually erect and loosely associated with it substrate ..... **Scorpidium** (p. 57)
1b. Typically found growing in drier habitats on various substrates ..... **Entodon** (p. 124)

Key AQ

1a. Submerged to emergent, typically in moving water ..... **Fontinalis** (p. 134)
1b. Terrestrial habitats on various substrates ..... **Myurella** (p. 232)

Key AR

1a. Leaf cells variously roughened, often giving plants a dull appearance 2
2a. Plants of wetland habitats, more or less 1-pinnate, erect or spreading ..... **Elodium** (p. 146)
2b. Plants of drier habitats 3
3a. Plants creeping and closely associated with substrate (bark, base of hardwoods) ..... **Rauiella** (p. 269)
3b. Plants typically ascending, erect, or arched 4
4a. Branching pattern regularly pinnate ..... **Abietinella** (p. 267)
4b. Branching pattern variable, with primary stem associated with substrate ..... **Anomodon** (p. 62)
1b. Leaf cells smooth, often giving plants a shiny appearance 4
5a. Plants submerged to emerged 6
6a. Plants in or near flowing water ..... **Hygrohypnum** (p. 48)
6b. Plants in still waters such as pools and lakes ..... **Amblystegiaceae** (p. 37)
(See **Sarmentypnum, Drepanocladus, Scorpidium**)
5b. Plants of dry to wet habitats, but only submerged seasonally 7
7a. Plants typically found on the trunk of trees 8
8a. Plants found in wet crotches and knotholes ..... **Anacamptodon** (p. 38)
8b. Plants of drier portions of tree trunks 9
9a. Leaves with short costa, ovate in shape, acute or obtuse apex ..... **Clasmatodon** (p. 80)
9b. Leaves typically with longer costa, lanceolate, tapered to a point ..... **Brachytheciaceae** (p. 73)
(See **Brachythecium, Sciuro-hypnum**)
7b. Plants on various substrates including bases of trees 10
10a. Costa short, double, or absent 11
11a. Rhizoids located along the stem, at points of leaf insertion ..... **Drepanocladus** (p. 45)
11b. Rhizoids typically restricted to the base of stems 12
12a. Leaves typically curved in one direction ..... **Homomallium/Hypnum** (p. 156/157)
12b. Leaves not curved, stems flattened or rounded (worm-like) ..... **Plagiothecium** (p. 202)
10b. Costa single and relatively obvious 13
13a. Rhizoids located along the stem, at points of leaf insertion 14
14a. Plants small, leaves wide-spreading to 90 degrees (squarrose) ..... **Amblystegiaceae** (p. 37)
(See **Campyliadelphus, Pseudocampylium**)
14b. Plants larger, leaves variously arranged, often curved 15
15a. Leaves concave, plants often reddish, brown, or yellow ..... **Amblystegiaceae** (p. 37)
(See **Hamatocaulis, Drepanocladus**)
15b. Leave flat and plants green, though yellowish or brownish ..... **Leptodictyum** (p. 50)
13b. Rhizoids typically restricted to the base of stems, few along stems ..... **Brachytheciaceae** (p. 73)
(See **Brachythecium, Sciuro-hypnum**)

Key AS

1a. Leaf cells are variously roughened, often resulting in a dull appearance of the plant 2
2a. Plants of wet habitats 3
3a. Stems with paraphyllia present, may occasionally be submerged ..... **Elodium** (p. 146)
3b. Stems lacking paraphyllia 4
4a. Plant smaller, forming loose to dense tufts ..... **Bryhnia** (p. 77)
4b. Plants larger, stems ascending to erect, sub-dendroid ..... **Rhytidiadelphus** (p. 152)
2b. Plants of drier habitats 5
5a. Rhizoids arising along the stem, sometimes forming a dense wooly covering 6
6a. Glaucous, bluish green plants, with dense wooly rhizoids ..... **Thelia** (p. 57)
6b. Yellow to golden plants, crowded leaves, rhizoids intermittent ..... **Rhytidium** (p. 237)
5b. Rhizoids typically limited to the base of the stem, with few along stem 7
7a. Stems appressed to bark at the base of hardwoods ..... **Rauiella** (p. 269)
7b. Stems ascending, erect and large ..... **Rhytidiadelphus** (p. 152)
1b. Leaf cells are smooth, often resulting in a shiny appearance 4
8a. Stems and branches typically distinctly worm-like, rounded in cross-section, leaves overlapping 9
9a. Leaves abruptly tapered to a hairpoint ..... **Cirriphyllum** (p. 80)
9b. Leaves gradually tapered to a short point ..... **Bryoandersonia** (p. 79)
8b. Stems and branches not as above 10
10a. Plants typically ascending or erect, arising from substrate 11
11a. Rhizoids arising from the stem of insertion of the leaves, rarely felted ..... **Sarmentypnum/Sanionia** (p. 56/55)
11b. Rhizoids typically restricted to the base of the stem 12
12a. Leaves wide-spreading, often pleated or wrinkled .. **Loeskeobryum/Brachytheciaceae** (p. 150/73) (See **Brachytheciastrum, Brachythecium, Sciaro-hypnum**)
12b. Leaves curved, sometimes in one direction ..... **Hypnum** (p. 157)
10b. Plants prostrate and closely associated with substrate 13
13a. Leaves curved sometimes in one direction, various substrates ..... **Hypnum** (p. 157)
13b. Leaves not typically curved 14
14a. Typical growing on tree trunks and rock ..... **Fabronia** (p. 128)
14b. Growing on various substrates including tree bases ..... **Brachytheciaceae** (p. 73) (See **Brachythecium, Rhynchostegium, Sciaro-hypnum**)

Key AT

1a. Found growing on wet rocks near streams or often submerged 2
2a. Found growing on wet rocks in and beside streams, sometimes submerged, usually prostrate and closely associated with its substrate ..... **Hygrohypnum** (p. 48)
2b. Found growing submerged in mineral rich habitats, often Calcium-rich fens, pools, and lake shores, usually erect and loosely associated with it substrate ..... **Scorpidium** (p. 57)
1b. Found growing in relatively drier habitats, typically vertical substrates such as trees and rock faces , may be found in wet areas ..... **Anomodon** (p. 62)

Key AU

1a. Found growing on wet rocks or often submerged 2
2a. Found growing on wet rocks in and beside streams, sometimes submerged, usually prostrate and closely associated with its substrate ..... **Hygrohypnum** (p. 48)
2b. Found growing submerged in mineral rich habitats, often Calcium-rich fens, pools, and lake shores, usually erect and loosely associated with it substrate ..... **Scorpidium** (p. 57)
1b. Found growing in relatively drier habitats, typically on substrates other than rock when found in wet habitats 3

3a. Plants small in loose mats on tree bark, shrubs, rotten wood, logs, and rocks, local species regularly produces brood branches ..... **Lindbergia** (p. 173)
3b. Plants small to large on various substrates, leaves secund to falcate-secund ..... **Hypnum** (p. 157)

Key AV

1a. Plants yellowish green to golden brown, leaves crowded, obscurely plicate and strongly rugose (wrinkled), cells roughened by upturned cells ..... **Rhytidium** (p. 237)
1b. Plants of various color and leaf arrangement, leaves not rugose, cells smooth 2
2a. Plants small, stems creeping 3
3a. Leaves spreading when moist, capsules ovoid to pyriform, found growing on the bark of trees and rocks ..... **Fabronia** (p. 128)
3b. Leaves erect, imbricate, regular or irregularly pinnate, growing on trunks of soft barked trees, logs, roots, stumps and rock ..... **Homalotheciella** (p. 82)
2b. Plants typically larger, stems creeping to ascending 4
4a. Leaves secund or falcate-secund ..... **Hypnum** (p. 157)
4b. Leaves terete, complanate, or subcomplanate ..... **Rhynchostegium** (p. 84)

Key AW

1a. Found growing on wet rocks in and beside streams, sometimes submerged, usually prostrate and closely associated with its substrate ..... **Hygrohypnum** (p. 48)
1b. Found growing submerged in mineral rich habitats, often Calcium-rich fens, pools, and lake shores, usually erect and loosely associated with it substrate ..... **Scorpidium** (p. 57)

Key AX

1a. Leaf cells variously roughened, often given the plant a dull appearance 2
2a. Typically of wetland habitats, regularly pinnate ..... **Elodium** (p. 146)
2b. Typically of various upland habitats, though usually moist 3
3a. Branches are erect to arching away from the substrate ..... **Anomodon** (p. 62)
3b. Branches typically in the same plane as the stems presenting a flattened growth pattern 4
4a. Stems regularly branched (pinnate or bipinnate) ..... **Cyrto-hypnum** (p. 268)
4b. Stems freely to subpinnately branched ..... **Leskea** (p. 170)
1b. Leaf cells smooth often giving them a shiny appearance 5
5a. Plants submerged on rocks, roots, wood or in the splash zones 6
6a. Leaf margins thickened and easily distinguished ..... **Platylomella** (p. 53)
6b. Leaf margins not differentiated 7
7a. Leaves broad with are rounded, obtuse or pointed apex, costa short and double or single ..... **Hygrohypnum** (p. 48)
7b. Leaves are relatively long, and narrow, tapering to a sharp point ..... **Hygroamblystegium** (p. 47)
5a. Plants may be in wet habitats, but not submerged 8
8a. Plants typical of tree trunks and branches 9
9a. Stems appressed to their substrate (tree trunks or occasionally rock) ..... **Leskeella** (p. 172)
9b. Stems arising from the trunk due to erect branches ..... **Drummondia** (p. 196)
8b. Plants of various substrates of habitat floor including tree bases 10
10a. Rhizoids found along the stem, sometimes abundantly 11
11a. Rhizoids dense forming a wooly tomentum along the stem, plants golden to brown ..... **Tomentypnum** (p. 89)
11a. Rhizoids limited to the insertion of leaves and rarely forming tomentum 12

12a. Plants often creeping over wet substrate, leaves long lanceolate ..... **Leptodictyum** (p. 50)
12b. Plants often somewhat ascending, leaves of various shapes with the apex narrowed from a broader base..... **Drepanocladus** (p. 45)
10b. Rhizoids typically restricted to base of stem, few along the stem .....**Sciuro-hypnum/Brachythecium** (p. 86/74)

Key AY

1a. Plants tree-like (dendroid) with erect secondary stem with little or no branching below, and regular to irregular branching above.....2
2a. Stems and branches flattened-foliate and sometimes arcing..... **Thamnobryum** (p. 264)
2b. Stems not flattened, branches spirally arranged .....**Climacium** (p. 101)
1b. Plants of various forms, but not dendroid 3
3a. Plant cells smooth (appearing shiny due to the absence of papillae) 4
4a. Rhizoids are abundant along the stems forming a wooly covering.....**Cratoneuron** (p. 44)
4b. Rhizoids few and mostly found at the base of the stem .....**Brachytheciaceae** (p. 73) (See **Brachythecium, Eurynchiastrum, Oxyrrhynchium, Sciuro-hypnum, Rhynchostegium**)
3b. Plant cells roughened by papillae or upturned cell ends often giving the plants a dull appearance.....5
5a. Plants irregular or unevenly branched, often shaggy in appearance.....6
6a. Plants of wet habitats, stems creeping to ascending, small leaves..... **Bryhnia** (p. 77)
6b. Plants of various habitats, large stems often erect, leaves pleated ..... **Rhytidiadelphus** (p. 152)
5b. Plants more or less regular pinnately branched 7
7a. Plants subpinnate to 1-pinnate.....8
8a. Upland habitats, rhizoids arising from older leaf axils ..... **Haplocladium** (p. 169)
8b. Typically wet habitats, rhizoids typically basal ..... **Elodium** (p. 146)
7b. Plants 2- to 3- pinnate and frondose ..... **Thuidium** (p. 270)

Key AZ

1a. Found growing on wet rocks in and beside streams, sometimes submerged, cells smooth (shiny in appearance) ..... **Hygrohypnum** (p. 48)
1b. Found growing on tree bark, rotten wood, logs, and rocks calcareous or acidic cells papillose (dull in appearance due to the presence of papillae) 2
2a. Stems creeping with secondary stems spreading or erect-spreading, leaves erect to wide-spreading when moist, cells with 1 to many papillae..... **Anomodon** (p. 62)
2b. Stems and branches creeping, leaves erect-spreading when moist, cells with a single papillae either on the back side or on both sides of the leaf..... **Leskea** (p. 169)

Key BA

1a. Found growing on wet rocks in and beside streams, sometimes submerged..... **Hygrohypnum** (p. 48)
1b. Found growing on tree bark, rotten wood, logs, and sometimes rocks.....2
2a. Leaves wide-spreading to squarrose when moist, cells smooth, brood branches present in the local species ..... **Lindbergia** (p. 172)
2b. Leaves erect-spreading when moist, cells papillose on back side or both sides, brood branches absent ..... **Leskea** (p. 169)

Key BB

1a. Plants dendroid, creeping primary stem, erect or ascending secondary stem, no branching below, branched above ..... **Thamnobryum** (p. 263)
1b. Plants not dendroid, stems creeping 2
2a. Plants loosely tufted, branches loosely or occasionally densely terete, due to arching stems, setae rough throughout ..... **Oxyrrhynchium** (p. 83)
2b. Plants tufted or mat forming, branches terrete, complanate, or subcomplanate, setae smooth throughout ..... **Rhynchostegium** (p. 84)

Key BC

1a. Found growing on wet rocks in and beside streams, sometimes submerged ..... **Hygrohypnum** (p. 48)
1b. Found growing on the bark at the base of trees, on logs, sometimes rocks ..... **Leskea** (p. 169)

Nomenclature and Resources

The following list of moss genera is arranged alphabetically by family, genus, and species. The nomenclature, genera descriptions, substrate, and habitat information are based Crum and Anderson (1981) and Flora of North America editorial committee (1993+).

Amblystegiaceae

Amblystegium

Substrates: tree trunks, rotten wood, rock, soil
Habitats: swamps to xeric habitats

CoC: 5
Indicator Status: FACU

Plants of this genus are small and range in color from green to yellowish. The stems are irregularly branched. Stem and branch leaves are little differentiated; both are erect to spreading, sometimes straight or rarely subsecund. Leaves are 0.5 – 1 mm long, ovate to oblong-lanceolate with an acuminate apex. The leaves are not plicate. The cells of the leaf margin are not differentiated. The margins are plane and range from entire to finely toothed. The costa is single and usually reaches mid leaf, though it is sometimes shorter or may reach 75% of leaf length. The seta is reddish and reaches 1 to 2.5 cm and the capsules are cylindrical, inclined to horizontal about 1.5 – 2 mm long.

Species

Amblystegium serpens (Hedw.) Schimp.

Amblystegium serpens – Photo by ©Michael Lüth

Anacamptodon

Substrates: bark of trees, wet, sheltered niches, crotches, fissures, knotholes on logs, stumps, sometimes rotten wet rock

CoC: 5
Indicator Status: FACU

Plants of this genus are small to medium and range in color from yellow to green. Stems are creeping, branches more or less ascending, straight to slightly curved at apices and somewhat radiculose. The stems are freely branched. Stem and branch leaves are not much differentiated; both are erect, spreading, or subsecund. The leaves are ovate to oblong-lanceolate with a short acuminate apex. Leaves not plicate. The costa is single extending to mid leaf or beyond. The cells of leaf margin are not differentiated, the margins are erect. The margins are entire and more or less crenulate at the tip. The seta is yellow, straight, and 0.7 – 1.4 cm long. The capsules are erect, oblong-cylindric, yellow to brown, 0.8 – 2 mm long, and strongly constricted below the mouth when dry.

Species

Anacamptodon splachnoides (Froelich ex Bridel) Bridel

Rarity: S1

Anacamptodon splachnoides - Photo by Bob Klips

Calliergon

Habitats: Moist or wet, more or less nutrient-rich fens, shores, ditches, swampy forests

CoC: 8
Indicator Status: OBL

Plants of this genus are medium to very large and vary greatly in color (green, pale green, yellowish, brownish, or sometimes pale pink). Stems are more or less densely radially branched. Stem leaves are slightly variable in shape including ovate-cordate, triangular-ovate, or narrowly elongate-cordate abruptly narrowed to apex, apex rounded or obtuse to acuminate or cleft. The costa is single, ending just below the leaf apex. The leaves are straight, concave (possibly strongly so), but not plicate. Rhizoids or rhizoid initials are located at various points on the leaves or on stems either scattered or in rows. The margins are entire or occasionally slightly sinuate.

Species

Calliergon cordifolium (Hedw.) Kindb.

Rarity: S1/2

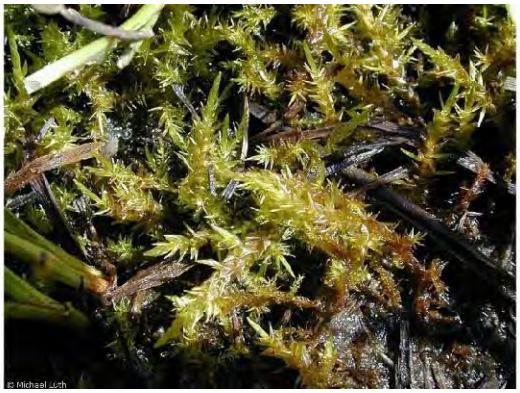
Habitats: Moist or wet, more or less nutrient-rich fens, shores, ditches, swampy forests, floating or submerged in lakes

Calliergon cordifolium – Photo by ©Michael Lüth

Calliergon gigantum (Schimp.) Kindb.

Rarity: S1/2

Habitats: Wet, more or less mineral-rich fens, ditches, shore



Calliergon giganteum - Photo by ©Michael Lüth

Calliergonella

Habitats: Wetlands (Calcareous wetlands, moderately rich fens, among sedges), lake margins, roadside ditches, in lawns

CoC: 5
Indicator Status: OBL

Plants of this genus are large (to 7 cm) in yellow-green or brownish loose tufts or mats. The stems are erect or semierect pinnately, subpinnately, or irregularly branched. Rhizoids arise from the ventral stem surface near the leaf base. The stem and branch leaves are not much differentiated. The leaves are erect-appressed and straight, 1.8 – 2.2 mm long. Leaves are of two forms, ovate and lanceolate, the apex usually cuspidate. The cells of the leaf margin are undifferentiated. The margins are plane to incurved and entire. The costa is short and double, inconspicuous or none. The leaves are plicate. The seta is long and more or less erect and the capsules are ovoid and horizontal.

Species

Calliergonella cuspidata (Hedw.) Loeske

Rarity: S1/2

Calliergonella cuspidata - Photo by ©Michael Lüth

Campyliadelphus

Substrate: rock, soil
Habitats: temporarily wet, calcareous or otherwise mineral-rich habitats

CoC: 5
Indicator Status: FACW

Plants of this genus are small to medium in size. They range in color from green to yellow-green to brownish. The stems are irregularly branched to pinnate. Rhizoids or rhizoid initials may arise from the underside of the costa at the point of the leaf insertion and the rhizoids may rarely form a dense, wooly or felted covering along the stems. The leaves are about 1 mm long and are spreading to almost erect. The leaves can be straight or falcate (curved like a sickle) and rounded-triangular or ovate to broadly ovate gradually to more or less suddenly narrowed to the apex. The leaves are concave and the acumen may be recurved in some leaves. The leaf margins are variable ranging from entire (smooth) to lightly toothed and are plane or slightly recurved near the base. The costa is single and extends to as much as 80% of the leaf length. The capsule is horizontal and cylindric to short-cylindric and curved in shape.

Species

Campyliadelphus chrysophyllus (Bridel) Kanda
=*Campylium chrysophyllum*
Rarity: S1/2

Campyliadelphus chrysophyllus - Photo by Keith Bowman

Campylium

Habitats: Intermediately mineral-rich fens, lake and river shores

CoC: 7
Indicator Status: FACW

Plants of this genus in New Jersey are medium in size. They range in color from green to yellowish or sometimes brownish. The stems are erect and irregularly branched to sometimes irregularly pinnate. Rhizoids or rhizoid initials are found on the stem or underside of the costa at the insertion and they rarely form a dense, wooly or felted covering along the stems. The rhizoids are slightly or strongly branched, smooth or slightly roughened with warty projections (papillae). The stem leaves are spreading to forming a 90 degree angle with the stem (squarrose). The leaves range from a little less than 2 mm to nearly 3 mm. Leaves are cordate or rounded-triangular with an acuminate apex and the acumen accounts for nearly 40% or more of the leaf length. The leaf margins are plane and can be entire (smooth) or slightly sinuate (toothed). The costa is quite variable, the leaves may possess no costa or a slender, single or double costa that extend to 25 to 33% of the leaf length. The capsules are horizontal, cylindric in shape, and curved.

Species

Campylium stellatum (Hedw.) C. Jens.

Rarity: S1/2

Campylium stellatum - Photo by Bob Klips

Campylophyllum

Substrates: soil, tree bases, decaying wood
Habitats: lowlands, forests, sheltered habitats

CoC: 5
Indicator Status: FAC

Plants of this genus in NJ are small, green or yellow-green. The stems are irregularly branched to pinnate. Rhizoids or rhizoid initials can be found on the stem or the lower side of the leaf where the costa joins the stem. The rhizoids can be slightly or strongly branched, and smooth or roughened, though this character is difficult to see in the field. The rhizoids rarely form a felted wooly layer (tomentum) on the stem. The stem leaves are erect when dry and more or less recurved when wet. The leaves can be somewhat oriented in the same direction (homomallous). The leaves are up to 1 mm long and narrowly to broadly ovate in shape with an acuminate apex that composes 40 to 60% of the leaf length. The leaf margins are plane or recurved near the base, and can be smooth (entire) or toothed (denticulate). The costa is short and double. The capsules are more or less horizontal, cylindric in shape, and slightly to distinctly curved. The capsules are held aloft on a seta about 1-2 cm long.

Species

Campylophyllum hispidulum (Bridel) Hedenas
=*Campylium hispidulum*

Cratoneuron

Substrates: rock, tree bases beside streams, springs, moist soil,
Habitats: moist or wet habitats in calcareous districts, calcareous fens

CoC: 7
Indicator Status: OBL

The plants in New Jersey are medium-sized and are typically green or yellowish, but can sometimes be more brownish. The stems are pinnate or irregularly branched. The rhizoids are found along the stem or on the lower side of the leaves at the intersection of the costa and the stem. The strongly branched rhizoids form a dense wooly and felted layer on the stem (tomentum). The stem leaves are longer than 1 mm long and straight or slightly curved (falcate) and narrowly to broadly triangular, rounded-triangular, or sometimes ovate in shape narrowing to an acuminate leaf apex. The leaf margins are plane or slightly recurved near the base and toothed (denticulate or serrulate) almost throughout. The costa is strong, single, and usually extending to the leaf tip (percurrent) or beyond (excurrent), although it sometimes ends well below leaf apex. The capsules are horizontal, cylindric in shape, and curved.

Species

Cratoneuron filicinum (Hedw.) Spruce
Rarity: S1

Cratoneuron filicinum – Photo by Michael Lüth

Drepanocladus

Substrates:
Habitats: variety of wetland habitats including mineral- and nutrient-rich wetlands, meso- to eutrophic terrestrial wetland habitats (fens), shores, ditches, submerged in pools and lakes, swampy forests

CoC: 5
Indicator Status: FAC

New Jersey plants variable ranging from small to large in a range of colors including green, yellow-green, yellowish, or brownish. The stems are sparsely and irregularly branched to sometimes more or less pinnate in basically one plane. Rhizoids are located along stem at the point of insertion of the costa on the lower side. The rhizoids are slightly or occasionally strongly branched, but rarely form a dense wooly and felted layer (tomentum). The stem leaves are erect-spreading, spreading, or sometimes forming 90 degree angles with the stem (squarrose). The leaves are highly variable ranging in length from less than 1 mm to greater than 6 mm and are straight or slightly curved (falcate). The leaves are concave and ovate (broadly), ovate-lanceolate, triangular, or rounded-triangular gradually narrowed to an acute to long-acuminate apex. The leaf margins are plane and smooth (entire), or slightly toothed (sinuate or denticulate). The costae are double and short or single and long, sometimes extending beyond the leaf apex (excurrent). The capsules are horizontal, cylindric in shape, and curved.

Species

Drepanocladus aduncus (Hedw.) Warnst.
=*Drepanocladus polycarpus*
Rarity: S1
Habitats: mineral- and nutrient-rich wetlands, eutrophic fens, shores, ditches, submerged in pools and lakes, swampy forests

Drepanocladus aduncus - Photo by Bob Klips

Drepanocladus polygamus (B.S.G.) L. Hedenas
=*Campylium polygamum*
=*Drepanocladus aduncus* var. *Kneiffii*
Rarity: S1/2
Habitats: mineral- and nutrient-rich wetlands, eutrophic fens, shores ditches, submerged in pools and lakes, swampy forest

Drepanocladus sordidus (Mull. Hal.) L. Henenas
Habitats: intermediately mineral-rich, meso- to eutrophic terrestrial wetland habitats, fens

Hamatocaulis

Substrates:
Habitats: mineral-rich, often slightly nutrient-enriched, spring-influenced habitats, lakeshores

CoC: 8
Indicator Status: FACW

New Jersey plants are medium-sized to very large, and variable in color including green, browninsh, variegated green and red, entirely red, or brownish to blackish red. The stems are pinnate or irregularly branched and in more or less one plane. Rhizoids or rhizoid initials can be found on the stem at or just below the leaf insertions. The stem leaves are ovate to broadly ovate and abruptly narrowed to an acute or acuminate apex. The leaves are concave, sometimes strongly so and usually distinctly plicate with the leaf suddenly curved near the tip. The leaf margins are irregularly and finely toothed near the leaf apex. The costa is single and ends beyond leaf middle.

Species
Hamatocaulis vernicosus (Mitt.) Hedenas
Rarity: S1

Hamatocaulis vernicosus – Photo by © Michael Lüth

Hygroamblystegium

Substrates: rock, tree trunks
Habitats: hardwood mesic forests, subxeric habitats, oligotrophic, calcareous spring areas, marshes, fens, ponds, fast flowing streams, and wet meadows

CoC: 3
Indicator Status: FACW

New Jersey plants are relatively small to large and range in color from yellow to dark green or sometimes blackish. The stems are irregularly and often freely branched. The rhizoids are sparsely branched and smooth often forming a dense, wooly, felted covering along the stem, but never arising from the underside of the costa surface. The stem and branch leaves are erect and may be slightly falcate-secund (turned in one direction). The leaves are upto 1 cm or longer and variously shaped including oblong-lanceolate to oblong-ovate, or rarely broadly ovate. The leaf apex is gradually narrowed to an acuminate, acute, or obtuse apex. Leaf margins are plane and smooth (entire) to toothed. The costa is broad and single extending to the leaf middle or extending to the leaf tip or beyond and is often curved beyond the leaf middle. The capsule is inclined, cylindric to oblong-cylindric in shape, and curved (arcuate).

Species

Hygroamblystegium varium var. *noterophilum* (Sull. & Lesq.) Vanderpoorten & Hedenas
Rarity: S1
Habitats: oligotrophic, calcareous spring areas

Hygroamblystegium varium var. *varium* (Hedwig) Monkemeyer
=*Hygroamblystegium fluviatile*
=*Hygroamblystegium tenax*
Substrates: rock, tree trunks
Habitats: hardwood mesic forests, subxeric habitats, marshes, fens, ponds, mountain fast flowing streams

Hygroamblystegium varium - Photo by Robert Klips

Hygroamblystegium varium var. *humile*
=*Leptodictyum humile*
Habitats: wet meadows, fens, marshes

Hygrohypnum

Substrates: irrigated, submerged or emergent rock (acid and calcareous), stone, wood
Habitats: in or along streams (montane)

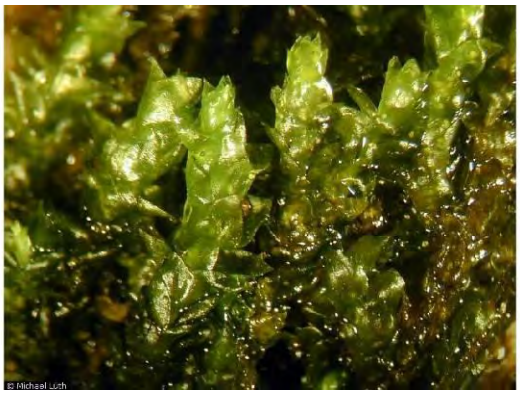
CoC: 5
Indicator Status: FACW

New Jersey plants are small to large vary in color, yellow-green, green, dark green, or blackish. The stems are unbranched or irregularly branched. The rhizoids are slightly to strongly branched and can be found along stem or on the lower side of the costa at inserstion and rarely form a dense, felted, wooly layer. The leaves are variably oriented: recurved, squarrose (or not), straight, falcate-secund. The leaves are also quite variable in shape including ovate, broadly ovate, oval, orbicular, ovate-lanceolate, oblong-lanceolate, or lanceolate and up to 1 mm or longer. . The leaf apex can be broadly rounded or obtuse and occasionally with a small pointed tip (apiculate), or acute and sometimes blunt. The apex is sometimes recurved. The margins are usually plane and can be smooth (entire) or weakly toothed. The costa is usually short and double ending below the middle of the leaf, but the costa is often single, slender or stout, and extending 50% to 75% of the leaf length, however, the costa can occasionally be double and long, rarely to the leaf tip. The capsules are erect and symmetric or inclined, ovoid to oblong-cylindric in shape, and slightly to strongly curved.

Species

Hygrohypnum closteri (Aust.) Grout
Rarity: S1
Substrates: irrigated or submerged rocks
Habitats: streams

Hygrohypnum duriusculum (DeNotaris) D. W. Jameson
Some specimens may be misidentified as *Hygrohypnum molle*
Substrates: irrigated, emergent acidic rock
Habitats: montane streams



Hygrohypnum duriusculum – Photo by Michael Lüth

Hygrohypnum eugyrium (Schimp.) Loeske
Rarity: S1
Substrates: irrigated acid rock
Habitats: in or along montane streams

Hygrohypnum luridum (Hedw.) Jenn

Rarity: S1

Substrates: irrigate calcareous rock, stone, wood

Habitats: montane streams

Hygrohypnum luridum – Photo by © Michael Lüth

Hygrohypnum ochraceum (Wils.) Loeske

Rarity: S1

Substrates: irrigate acidic rock and wood

Habitats: streams

Hygrohypnum ochraceum – Photo by © Michael Lüth

Leptodictyum

Substrates: humus, logs, tree bases, rock
Habitats: swamps, wet depressions in forests, aquatic, in streams and rivers

CoC: 5
Indicator Status: FACW

New Jersey plants are medium-sized and green, yellow-green, or brown-green. The stems are irregularly to sparingly branched. The rhizoids are slightly branched and found along the stem or the lower side of the costa at the insertion, but the rhizoids rarely form a dense, felted wooly layer. The stem and branch leaves are erect-spreading to wide-spreading. The leaves are typically oblong-lanceolate with and acuminate apex and 2-6 mm long. The leaf margins are plane and smooth (entire) or obscurely toothed. The costa is single and extends 60% to 75% the leaf length. The capsule is inclined to horizontal, cylindric in shape, and curved.

Species

Leptodictyum riparium (Hedw.) Warnst.

Leptodictyum riparium – Photo by ©Michael Lüth

Platydictya

Substrates: moist, shaded rock(limestone, sandstone), rock in damp, sheltered places, crevices of cliffs, under rock ledges, peaty soil, humus under overhanging turf, hollows under roots of trees, lower sides of logs, bark at base of hardwoods, exposed roots
Habitats: stream valleys and calcareous habitats

CoC: 5
Indicator Status: FAC

New Jersey plants are very small and light to dark green or brownish. The stems are freely and irregularly branched. The rhizoids are slightly branched and located at or below the leaf insertion and rarely forms a dense felted layer. The stem leaves are erect-appressed to losely spreading, though sometimes somewhat turned in one direction (subsecund). The leaves are lanceolate and very small (less than 0.5 mm) and the apex tapers to a point (acuminate). The leaf margins are plane and smooth (entire) to lightly toothed. The leaves are ecostate or the costa is very short, double, and indistinct. The capsules are erect or variously inclined, oblong-cylindric to oblong-ovoid in shape, and symmetric or asymmetric.

Species

Platydictya confervoides (Brid.) Crum
Rarity: S1
Substrates: moist, shaded limestone rock
Habitats: stream valleys

Platydictya confervoides - Photo by Bob Klips

Platydictya jungermannioides (Bridel) H. A. Crum
Substrates: rock in damp, sheltered places, crevices of cliffs, under rock ledges, peaty soil, humus under overhanging turf, hollows under roots of trees, lower sides of logs, calcareous habitats
Habitats: calcareous habitats

Platydictya minutissima (Sull. & Lesq.) Crum
Rarity: S1
Substrates: moist, shaded rock (limestone, sandstone)

Platydictya subtilis (Hedw.) Crum

Rarity: S1

Substrates: bark at base of hardwoods, exposed roots, logs

Platydictya subtilis – Photo by © Michael Lüth

Platylomella

Substrates: wet rock, tree roots, rotting wood, base of trees, rock (acid and calcareous)
Habitats: along streams, waterfalls, seeps (submerged or in splash zone) lowland and montane deciduous or mixed deciduous-coniferous forests

CoC: 7
Indicator Status: FAC

New Jersey plants can be small to somewhat large and they are dark green to blackish with yellowish green shoot apices. The stems are irregularly branched to subpinnate. The rhizoids are slightly branched and typically found at the base of shoots, though they may be adventitious at the tip on prostrate shoots or form a felted, wooly layer on the stem. The stem leaves are erect-spreading, straight or incurved and 0.5-1.5 mm long. The leaves are cordate-ovate to ovate-lanceolate in shape and the leaf tips are gradually or abruptly narrowed to a long point (acuminate), sometimes a short point (apiculate), and the leaf tips are often obtuse. The leaf margins are plane and toothed at the tip, to the base or sometimes not at all. The margins are differentiated conspicuously or occasionally inconspicuously so. The costa is strong and single and extends to the leaf tip (percurrent) or beyond (short-excurrent), usually continuous with the leaf margin at the tip. The branch leaves are similar to the stem leaves, though slightly smaller and narrower. The capsules are horizontal to nodding, oblong-cylindric in shape, asymmetric or sometimes curved.

Species

Platylomella lescurii (Sull.) Andrews
=*Sciaromium lescurii*
Rarity : S1

Pseudocampylium

Substrates: humus, litter, under dense grass and sedge vegetation
Habitats: mineral-rich and eutrophic wet meadows and swamps

CoC: 7
Indicator Status: FACW

New Jersey plants are small and light green to yellowish. The stems are freely and irregularly branched. The rhizoids are lightly to strongly branched and found on the stem or the lower side of the costa at the insertion, though they can rarely form a felted layer on the stem. The stem leaves are wide-spreading to a 90 degree angle to the stem (squarrose) and 0.5-0.7 mm long. The leaves are cordate-ovate in shape tapering to a long point (long acuminate). The leaf margins are plane or slightly recurved at the base and smooth or nearly so. The costa is single and reaches from 50% to 75% of the leaf length. The capsule is horizontal, subcylindric in shape, and curved.

Species

Pseudocampylium radicale (P. Beauvois) Vanderpoorten & Hedenas
=Campylium radicale
Rarity: S1/2

Sanionia

Substrates: rock, logs, stumps, trees, soil
Habitats: forests, open habitats, mires

CoC: 5
Indicator Status: FACW

New Jersey plants are small to large and green or yellowish green in color. The stems are variably branched from pinnate in more or less one plane, irregularly branched to almost unbranched. The rhizoids are slightly branched and arise from the stem or the lower side of the costa at its insertion, and may rarely form a felted layer on the stems. The stem leaves are crowded, curved sometimes greatly so, almost straight. The leaves are typically lanceolate in shape and most often pleated (plicate), though rarely leaves are not pleated. The leaf is tapered at the tip to a long pointed to very long pointed. The leaf margins can be incurved near the base, plane or recurved near the base and finely to distinctly toothed near the base and finely toothed or smooth at the tip. The costa is single extending into the leaf acumen. The capsules are horizontal, erect, or inclined, cylindric or short-cylindric in shape, and curved to straight.

Species

Sanionia uncinata (Hedw.) Loeske
=*Drepanocladus uncinata*
Rarity: S1

Sanionia uncinata – Photo by Michael Lüth

Sarmentypnum

Substrates:
Habitats: intermediately mineral-rich fens, around springs, submerged in lakes

CoC: 7
Indicator Status: FACW

New Jersey plants are medium-sized and green, yellowish, or sometimes with a red secondary pigment. The stems are sparsely to densely branched radially. The rhizoids can be found at various points on leaves and scattered in rows along the stem. The stem leaves are curved, sometimes strongly so, or occasionally straight and concave. The leaves can be indistinctly or not at all pleated. The stem leaves are ovate-triangular or ovate and gradually narrowed to the leaf apex. The leaf margins distinctly toothed near the base, the tip, or both. The costa is single and extends 60% to nearly 100% of the leaf length.

Species

Sarmentypnum exannulatum (Schimp.) Hedenas
=*Warnstorfia exannulata*

Sarmentypnum exannulatum – Photo by Michael Lüth

Scorpidium

Substrates: calcium-rich soil, bedrock
Habitats: mountains, fens (calcium-rich), springs, depressions (water-filled), shores, submerged, intermediately mineral-rich and often spring-influenced fens, shores, lakeshores

CoC: 9
Indicator Status: OBL

New Jersey plants are medium-sized to very large and vary in color including green, brownish yellow, brownish to blackish red, or red. The stems are irregularly branched to pinnate in more or less one plane. Rhizoids are located on the stem at or just below the leaf insertions. The stem leaves are ovate-lanceolate to broadly ovate in shape, sometimes almost circular and the apex is gradually or abruptly narrowed to the tip, suddenly curved at the tip, and sometimes indistinctly so or more or less straight. The leaf apices are obtuse, apiculate, acute, or acuminate. The leaves are concave and sometimes strongly so, and not or barely pleated. The leaf margins are entire near the base and finely toothed or more or less entire near the leaf tip. The leaves can have a single or double costa that is short or ending beyond the leaf middle, in rare instances the leaves may be ecostate.

Species

Scorpidium cossonii (Schimper) Hedenas
=*Limprichtia revolvens*
Rarity: S1
Substrates: calcium-rich soil, bedrock
Habitats: mountains, calcium-rich fens, springs, water-filled depressions, shores, submerged

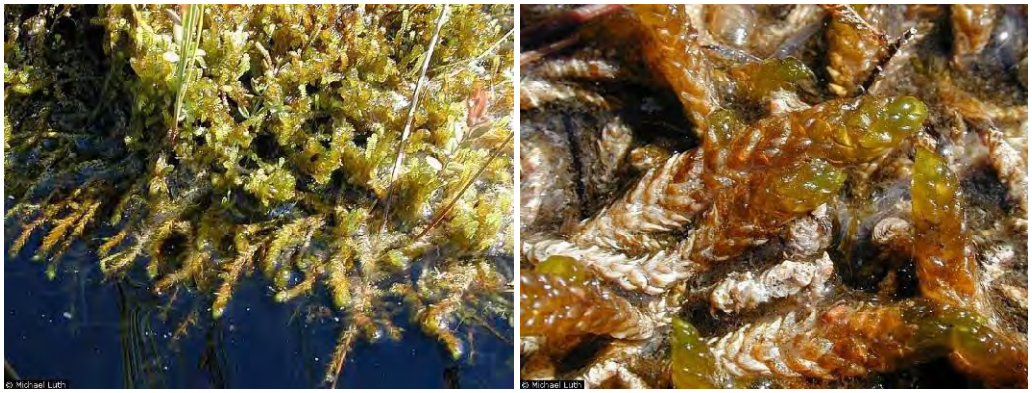
Scorpidium revolvens (Sw.) Rubers in A. Touw and W.V. Rubers
=*Limprichtia revolvens*
Rarity: S1
Habitats: mountains, intermediately mineral-rich and often spring-influenced fens, small periodically water-filled depressions, shores, submerged

Scorpidium revolvens – Photo by © Michael Lüth

Scorpidium scorpioides (Hedw.) Limpr.

Rarity: S1

Habitats: fens, pools, lakeshores, submerged in lakes



Scorpidium scorpiodes – Photos by © Michael Lüth

Warnstorfia

Substrates:
Habitats: mineral-poor and acidic, sometimes nutrient-rich habitats, fens, bog pools, depressions in rock, rock with trickling water

CoC: 7
Indicator Status: OBL

New Jersey plants are medium-sized and green, yellow-green, brownish, red-brown, or very rarely with clear red pigment. The stems are sparsely to densely branched radially. Rhizoids are located at various points on leaves and scattered or in rows along the stem. The stem leaves are straight or curved (falcate) and concave. The stem leaves are triangular to ovate and gradually narrowed to a long point, obtuse, or blunt tip. The leaf margins are toothed or smooth. The costa is single and extend 50% to 80% of the leaf length.

Species

Warnstorfia fluitans (Hedw.) Loeske
=*Drepanocladus fluitans*

Warnstorfia fluitans – Photo by © Michael Lüth

Andreaeaceae

Andreaea

Substrates: siliceous rock, Neutral to acidic boulders
Habitats: cliffs, boulders, cliffs and walls, generally wet sites

CoC: 7
Indicator Status: UPL

New Jersey plants are usually small and commonly cemented to substrate in a dense turf. The stems are erect with irregularly branching and have rhizoids at the base. Plants are reddish black, black, greenish, or brown. The stems are usually brown. The leaves are spirally arranged around stem in several rows and are usually brittle resulting in many broken leaves. Leaves are wide-spreading to 90 degrees (squarrose) or erect-spreading. The leaves are curved, sometimes in one direction, to straight. The leaves are short-lanceolate or broadly subulate from an ovate base, widest beyond the leaf middle with the apex oblique or symmetric. The leaves commonly end in a distinct single cell apiculus. The costa is absent in *A. rupestris* and present in *A. rothii* and usually filling the leaf apex. Leaf margins are plane to weakly incurved, seldom recurved and entire or occasionally weakly toothed. The sporophytes are terminal on an elongate gametophytic stalk called a pseudopodium, the seta is essentially absent. The capsule is 0.5-2 mm long, erect, elliptic in shape, and releasing spores from lateral longitudinal valves (usually 4).

Species

Andreaea rothii Web. & Mohr
Rarity: S1
Substrates: siliceous rock
Habitats: cliffs, boulders

Andreaea rothii – Photo by Michael Lüth

Andreaea rupestris Hedw.

Rarity: S1

Substrates: neutral to acidic boulders

Habitats: cliffs and walls, generally wet sites

Andreaea rupestris – Photo by Michael Lüth

Anomodontaceae

Anomodon

Substrates: bark deciduous trees (base, epiphytic), soil, rock (basic and acidic), vertical walls (limestone), logs
Habitats: deciduous forest (secondary), open spaces, mesic calcareous environments

CoC: 5
Indicator Status: FACU

New Jersey plants are small to large and more or less glaucous, green to rusty brown. The stems are branched and the branches are erect to arcuate, and sometimes attenuate to flagellate at the tips. The branch leaves are appressed to curved in a single direction (secund) or crispate when dry and complanate or erect to tightly overlapping when moist. The branch leaves are broadly ovate to lanceolate and more or less abruptly narrowed mid leaf. The leaf margins are plane, sometimes wavy (undulate) or revolute and smooth (entire), variously roughened (papillose, crenulate, serrulate) or sometimes toothed near the apex. The leaf apex can be rounded, obtuse, acute, or narrowly long pointed (acuminate). The costa is usually strong, though sometimes obscured by leaf cells and ending before the leaf middle. The leaf cells are roughened by 1 to many papillae on both surfaces. The seta extends to just over 2 cm. The capsules are symmetric.

Species

Anomodon attenuatus (Hedw.) Hub.
Substrates: tree bark, at base, soil, rock

Anomodon attenuatus - Photos by Keith Bowman

Anomodon minor (Hedw.) Lindb.

Rarity: S1/2

Substrates: calcareous rock, bark of trees

Habitats: deciduous forests

Anomodon minor - Photos by Bob Klips

Anomodon rostratus (Hedw.) Schimp.

Substrates: base or bark of deciduous trees, soil, fallen logs

Habitats: deciduous forests, open spaces, secondary forests, vertical calcareous rock, acidic (occasional)

Anomodon rostratus - Photo by Keith Bowman

Anomodon rugelii (C. Mull.) Keissl.

Rarity: [N, B, S1] S1

Substrates: tree trunks (generally 1-2 m above base), rock (basic and acidic)

Habitats: montane deciduous forests

Anomodon rugelii – Photo by ©Michael Lüth

Anomodon tristis (Cesati) Sullivant & Lesquereux

=*Haplohymenium trieste*

Rarity : S1/2

Substrates: bark of trees

Habitats: deciduous forests

Anomodon tristis - Photo by Robert Klips

Anomodon viticulosus (Hedw.) Hook. & Tayl.

Substrates: limetone rock or vertical walls, epiphytic

Habitats: mesic calcareous environments of montane deciduous forests

Anomodon viticulosus - Photos by Keith Bowman

Archidiaceae

Archidium

Substrates: moist open sandy, loamy, or clay soils, mud, and rock outcrops
Habitats: wide variety of open habitats (roadsides, ditches, meadows, prairies, sand dunes, and creeks)

CoC: 3
Indicator Status: FAC

New Jersey plants are less than 2 cm tall and mostly green. The stems are upright. The leaves are born on the upper portions of the stem. The leaves are ovate, ovate-lanceolate, linear-lanceolate to triangular and often reduced in the upper portion of the stem. The leaf apex is acute to acuminate. The leaves are flat or somewhat concave, and sometimes incurved or rarely curved in one direction (secund). The margins are plane, recurved or rarely incurved and the upper margins are smooth to finely toothed. The costa is absent or weak and single ending below the apex or more often strong and single extending into the leaf tip or beyond in a hairpoint. The capsules are immersed in the perichaetial leaves and brown or golden at maturity.

Species

Archidium ohioense Schimp. ex C. Mull.
Rarity: S1

Aulacomniaceae

Arrhenopterum

Substrates: mineral or humid soil, slopes of ravines, bark at tree bases
Habitats:

CoC: 5
Indicator Status: FAC

New Jersey plants grow in small mats. The shoots are glossy near the shoot tip. The stems are reddish brown or yellow and weakly complanate-foliate. Rhizoids are conspicuous along the stem. The plants are scarcely altered when moist. The leaves are oblong-ovate and concave, some are asymmetric. Leaf margins are revolute on one or both sides near the base and strongly toothed near the leaf tip. The leaf cells are smooth, bulging or roughened (papillae 1 per cell, weakly developed or absent) above and below. The costa is prominent, usually not straight throughout, extending nearly to the leaf apex and there are sometimes short lateral spurs. The seta is single, reddish brown in color, and stand 1 to 1.5 cm tall. The capsules are 3.5-5 mm long.

Species

Arrhenopterum heterostichum Hedw.
=*Aulacomnium heterostichum*

Arrhenopterum heterostichum - Photos by Keith Bowman

Aulacomnium

Substrates: peat, organic soil, moist to wet mineral soil, rock
Habitats: wet habitats, fens, marshes, swamps

CoC: 5
Indicator Status: FACW

New Jersey plants can be up to 10 cm tall in loose, irregular mats or dense cushions. The plants are yellow, yellow-green or brown to blackish with yellow, yellow-green, or yellowish brown stems. Rhizoids are located between the leaves along the entire stem and conspicuous whether moist or dry, sometimes the rhizoids are only visible among leaves at the base of the plants. The leaves are distant and do not cover the rhizoids, or the leaves overlap (imbricate) hiding the rhizoids. The leaves can be wavy (undulate), twisted or straight when dry and erect-spreading when moist. The leaves are broadly to narrowly lanceolate, widest near the base and most often concave. The leaf apices can be acute, acuminate, or narrowed, rounded and somewhat hooded (cucullate). The leaf margins are revolute in the lower 2/3 and irregularly toothed at the apex. The leaf cells are roughened with papillae. The costa is somewhat wavy. The seta stands 3-5 cm and the capsules are inclined to horizontal and 3-4 mm.

Species
Aulacomnium palustre (Hedw.) Schwaegr.

Aulacomnium palustre - Photo by Robert Klips

Bartramiaceae

Bartramia

Substrates: soil, rock, base of trees, downed trunks
Habitats: moist shady forests

CoC: 5
Indicator Status: FAC

New Jersey plants are dull green to glaucous, sometimes yellowish or yellowish brown in loose to dense tufts. The stems erect are variable in height standing between 0.5 and 8 cm tall. The leaves are flexuose to crisped when dry and laxly erect to erect-spreading when moist. The leaves are narrowly lanceolate to linear and measure 4 to 7 mm in length. The costa extends nearly to the leaf tip (subpercurrent) or beyond (excurrent). The leaf cells are roughened due to upturned cell ends (prorulose) on both surfaces. Leaf margins are plane or revolute and coarsely toothed near the apex and the teeth are paired. The seta is 0.5-2.5 cm and flexuose. The capsules are inclined or sometimes erect, subglobose, ovoid or pear-shaped (pyriforme) in shape and furrowed when dry.

Species
Bartramia pomiformis Hedw.

Bartramia pomiformis - Photo by Keith Bowman

Philonotis

Substrates: rock, soil
Habitats: seepy, open habitats wet places, roadsides, springs

CoC: 5
Indicator Status: FAC

New Jersey plants form lax to dense tufts and are glaucous to whitish or yellowish possibly brown toward the base. . The stems erect and simple to forked are quite variable in height ranging from 1 to 20 cm. The stems may have a whorl of branches. Rhizoids are more or less felted (tomentose) along the stem near the base. The leaves are in many rows or rarely in 5 distinct rows. The leaves are erect-spreading or somewhat curved in a single direction (secund) when dry and erect-spreading to spreading when moist. The uppermost leaves are not spiraled around the stem and sometimes appressed, erect to spreading, or imbricate. The leaves are ovate-lanceolate with apex narrowed to short (acute) to long pointed (acuminate) or rarely obtuse. The lower surface of the leaves is smooth or rough due to upturned cell ends (prorulose). The leaf margins are plane or revolute and toothed throughout, teeth may be single or paired. The costa extends to just below the leaf apex or beyond. The seta is single and straight or flexuose and about 1.5 to 4 cm long. The capsules are erect, horizontal, or inclined, globose to ovoid in shape, furrowed when dry and 1 to 3 mm long.

Species

Philonotis fontana var. *fontana* (Hedw.) Brid.

Substrates: rock, soil
Habitats: seepy, open habitats

Philonotis Fontana - Photo by Bob Klips

Philonotis marchica (Hedwig) Bridel

=*Philonotis muhlenbergii*

Rarity: S1

Substrates: rock, soil

Habitats: wet places, roadsides, springs

Philonotis marchica - Photo by Bob Klips

Plagiopus

Substrates: soil, humus, rock (basic and acidic)
Habitats: seeps, crevices of cliffs

CoC: 7
Indicator Status: FACU

New Jersey plants form dull olive green to brownish dense tufts. The stems are erect to ascending and are 2 to 10 cm long. The lower stems are covered in rhizoids. The leaves are in 3 rows and laxly erect or erect-spreading and somewhat curved when dry and erect-spreading when moist. The leaves are narrowly lanceolate with the apex narrowed to a long point. The leaf margins are revolute nearly throughout and often toothed (paired teeth) near the tip. The costa extends to just below the leaf apex (percurrent) to beyond (short-excurrent) and the lower surface is toothed. The seta is single, elongate, straight or flexuose and from 0.7-1.8 cm tall. The capsules are small.

Species

Plagiopus oederianus (Sw.) Crum & Anderson

Rarity: S1

Plagiopus oederianus – Photo by © Michael Lüth

Brachytheciaceae

Brachytheciastrum

Substrates: mineral soil, humus, litter, decaying wood, trunk bases
Habitats:

CoC: 4
Indicator Status: FAC

New Jersey plants are small to medium-sized in green to golden brown loose to dense tufts. The stems are creeping, ascending, or sometimes erect and regularly or irregularly pinnate. The stems can be densely or loosely terete- or subcomplanate-foliate, or sometimes julaceous. The branches are similar to the stems or more strongly complanate-foliate. The stem leaves are erect, densely arranged, straight, and often flexuose near the apex. The stem leaves are lanceolate with the apex gradually tapered to long pointed (acuminate) and slightly to strongly concave, not to moderately pleated (plicate). The leaf margins are variously toothed to almost entire. The costa extends to about 80% of the leaf length and may be thick or thin near the tip and there may be a terminal spine. The branch leaves are smaller, somewhat narrower, straight, and the lower side of the costa is strongly toothed. The seta is red-brown to reddish orange and slightly roughened in the lower portion and smooth near capsule or sometimes smooth throughout. Capsules are inclined, horizontal, or pendent; red-brown in color with age remaining partly greenish until almost mature; ovate, elongate, or cylindric in shape; and usually curved.

Species

Brachytheciastrum velutinum (Hedw.) Ignatov & Huttunen
Rarity: S1

Brachytheciastrum velutinum - Photo by © Michael Lüth

Brachythecium

Substrates: soil (wet), peat, rotten logs (affected by temporary flooding), rock (shaded, limestone), concrete blocks, trees (bases, trunks), litter
Habitats: wooded areas (open, moderately shaded), wet places, fens, swamps, swampy forests, alder, sedge swamps, alluvial sand banks along streams, temporary flooding depressions in xeric areas, forests, lawns exposed

CoC: 4
Indicator Status: FAC

New Jersey plants are small to large in loose to dense mats and variable in color ranging from light to dark green and sometimes whitish, yellowish, or brownish, becoming pale straw colored (stramineous) to yellow-brown with age. The stems are creeping, ascending, erect, or arching and densely to loosely terete-foliate, rarely subcomplanate-foliate or julaceous. The stems are irregularly or sometimes regularly pinnate and the branches are terete-, subcomplanate-, or complantate-foliate. Stem leaves are appressed, erect, variously spreading, or curved in one direction (falcate-secund). The stem leaves are often loosely or tightly imbricate or rarely somewhat spaced. Stem leaves are lanceolate, ovate, or triangular with apices abruptly or gradually tapered or acuminate, or occasionally piliferous and slightly to strongly concave, strongly to weakly pleated (plicate), appearing crumpled, or not at all plicate. Leaf margins are toothed or entire. The costa is moderate to somewhat stout extending 40 to 80% of the leaf length and may end with a terminal spine. Branch leaves are usually smaller and narrower with the apex more gradually acute or acuminate than the stem leaves. The seta is typically red-brown, but varies by species, becoming darker with age and may be rough or smooth. The capsules are inclined, horizontal, or somewhat pendent and the color is similar to that of seta, although it is usually darker in color, ovate, elongate, or cylindric in shape, and straight to curved.

Species

Brachythecium acuminatum (Hedw.) Aust.
=*Brachythecium oxycladon* - (Tropicos)
Rarity: S1/2
Substrates: tree trunks, bases

Brachythecium acutum (Mitt.) Sull.

Often identified as *B. salebrosum*

Rarity: S1/2

Substrates: wet soil, peat, rotten logs

Habitats: fens, swamps, swampy forests

Brachythecium acutum - Photo by Keith Bowman

Brachythecium campestre (Mull.Hal.) Schimper

Substrates: soil, limestone, concrete blocks, tree trunks

Habitats: wooded areas

Brachythecium laetum (Brid.) Schimp.

=Brachythecium digastrum

Rarity: S1

Substrates: soil, rock

Habitats: open and moderately shaded habitats

Brachythecium laetum - Photo by Keith Bowman

Brachythecium rivulare Schimp

Rarity: S1/2

Substrates: soil in rock logs (affected by temporary flooding)

Habitats: wet places, wet semiliquid peat in alder, sedge swamps, alluvial sand banks along streams, temporary flooding depressions in xeric areas,

Brachythecium rivulare – Photo by © Michael Lüth

Brachythecium rutabulum (Hedw.) Schimp.

Substrates: tree bases, rotten logs, litter and soil

Habitats: forests, shaded rock, lawns

Brachythecium rutabulum – Photo by © Michael Lüth

Brachythecium salebrosum (Web.& Mohr.) Schimp.

(likely either *B. acutum* or *B. campestre* , but this species is not found in NJ)

Substrates: soil, rock, tree bases, rotten logs,

Habitats: exposed to shady habitats

Bryhnia

Substrates: soil, rock faces, crevices, ledges, wood, rotten logs
Habitats: steep banks along roads and creeks, moist (wet) shaded to open habitats, forests, brooks

CoC: 3
Indicator Status: FACW

New Jersey plants are small to medium-sized in green or yellowish to brownish loose to dense tufts. The stems are creeping to ascending and unevenly foliate, julaceous or not and irregularly to regularly pinnate. The branches are moderately dense terete- to complanate-foliate, or sometimes julaceous. Stem leaves are erect or variously spreading. The leaves are typically imbricate-appressed and ovate, ovate-triangular, or lanceolate in shape with the apex gradually tapering, acute, acuminate, truncate, apiculate, or hooded (cucullate). The costa is broad throughout and extends 40 to 80% of the leaf length and may have a terminal spine on the lower side of the leaf. The leaf cells may be roughened by upturned cell ends (prorate). Branch leaves are smaller and narrower with acute to acuminate apex. The lower side of the costa is strongly toothed and more strongly prorate. The capsules are inclined to horizontal, brownish orange to red-brown in color, cylindric in shape, and not or only slightly curved.

Species

Bryhnia graminicolor (Brid.) Grout
Rarity: S1/2
Substrates: soil, rock faces, crevices, ledges, wood
Habitats: steep banks along roads and creeks, moist shaded to open habitats

Bryhnia graminicolor - Photo by Bob Klips

Bryhnia novae-angliae (Sull. & Lesq.) Grout

Substrates: soil, rock, rotten logs

Habitats: wet shady places, forests, along small brooks, wet places on slopes

Bryhnia novae-angliae – Photo by Keith Bowman

Bryoandersonia

Substrates: soil, landslides, rock, tree bases
Habitats: forest, among grasses in meadows and lawns

CoC: 3
Indicator Status: FAC

New Jersey plants are large and form dense or moderately dense tufts. The plants are green to golden brownish. Stems are worm-like (julaceous), irregularly pinnate and creeping or more commonly ascending to erect. The branches are terete-foliate. The stem leaves are erect- spreading, loosely imbricate in older parts of shoots and closely imbricate at shoot apices. The stem leaves are broadly ovate-triangular to broadly ovate with a gradually tapering, short-acuminate or apiculate apex. Stem leaves may be strongly concave or slightly plicate. The leaf margins are variously toothed. The costa is narrow extending 50 to 90% of the leaf length. Branch leaves are similar to stem leaves. The seta is less than 3 cm. The capsules are inclined to horizontal, brown in color, oblong in shape, and slightly curved.

Species
Bryoandersonia illecebra (Hedw.) Robins.

Bryoandersonia illecebra - Photos by Keith Bowman

Cirriphyllum

Substrates: soil, humus, duff, decaying wood, limestone
Habitats: mesic to wet forests, ravine slopes, tall herb vegetation

CoC: 5
Indicator Status: FACW

New Jersey plants are large and light green or whitish in loose tufts. Stems are usually worm-like (julaceous) or variously terete-foliate, regularly pinnate, and creeping. The branches are terete-foliate Stem leaves are erect, loosely imbricate to strongly concave, and not or only slightly pleated (plicate). Stem leaves are ovate or elliptic with an abruptly tapered, piliferous, apex. The leaf margins are variously toothed. The costa is moderate to somewhat stout extending 30 to 60% of the leaf length. The branch leaves are similar to the stem leaves, though smaller and narrower and often more gradually tapered and twisted just below apex. The seta is rough and dark brown. Capsules are inclined to horizontal, brown in color, ovate to elongate in shape, and slightly curved.

Species
Cirriphyllum piliferum (Hedw.) Grout
Rarity: S1

Clasmatodon

Substrates: tree trunks and bases, calcareous rocks
Habitats: flood plain forests

CoC: 4
Indicator Status: FAC

New Jersey plants are small in dull to bright green loose mats. Stems are irregularly branched, creeping and terete-foliate or occasionally subsecund. The branches are densely foliate. Stem leaves are appressed when dry and spreading when moist. Stem leaves are ovate to ovate-lanceolate and acute to narrowly obtuse at the apex. The leaves are concave and not plicate. Leaf margins are entire to toothed near the apex. The costa is slender extending 33 to 66% of the leaf length. Branch leaves similar to stem leaves. The seta is reddish and smooth up to 0.5 cm. Capsules are erect, brown in color, narrowly elliptic to oblong in shape, and symmetric.

Species
Clasmatodon parvulus (Hampe) Sullivant in A. Gray
Rarity: S1

Eurhynchiastrum

Substrates: soil, rock, decaying logs and stumps, tree bases, shady rock vertical surfaces
Habitats: forests, wet slopes of forested ravines, open ground in xeric steppe areas (among other mosses in granite, limestone)

CoC: 5
Indicator Status: FAC

New Jersey plants are small to medium-sized in green or yellowish to brownish in mats or tufts. Stems irregularly and densely branched, creeping to arching and loosely to densely terete-foliate. The branches are more densely foliate at their apices. Stem leaves are erect to slightly spreading, loosely to closely imbricate or somewhat spaced. Stem leaves are broadly ovate-triangular to ovate-lanceolate and gradually tapered or broadly acuminate at apex, rarely blunt. Stem leaves are slightly concave and not plicate, or plicate in larger plants. Leaf margins are toothed to nearly entire. The costa is strong extending 60 to 85% of the leaf length ending in a terminal spine. Branch leaves smaller and narrower than stem leaves. The Seta is red-brown, smooth or rarely slightly roughened at places, and less than 2 cm tall. Capsules are inclined to horizontal, red-brown in color, oblong in shape, and slightly curved on the upper side.

Species

Eurhynchiastrum pulchellum (Hedwig) Ignatov & Huttunen
=*Eurhynchium pulchellum*

Eurynchiastrum pulchellum – Photo by © Michael Lüth

Homalotheciella

Substrates: trunks of soft-barked trees, logs, roots, stumps, rock
Habitats: mesic to wet forests

CoC: 7
Indicator Status: FAC

New Jersey plants are small in yellowish dense mats. Stems are regularly or irregularly pinnate, creeping, and loosely imbricate-foliate. The branches are terete-foliate. Stem leaves are erect, often curved in the same direction (homomallous) and closely arranged. Stem leaves are concave, ovate in shape with a slender-acuminate apex. The margins are toothed. The costa is slender and sometimes indistinct and extending to the leaf middle or beyond. Branch leaves similar to stem leaves. The seta is light brown, roughened and less than 1cm long. Capsules are exserted, brown in color, erect, ovoid or slightly asymmetric in shape, and 1-1.5 mm long.

Species

Homalotheciella subcapillata (Hedw.) Broth.

Rarity: S1/2

Homalotheciella subcapillata - Photo by Bob Klips

Oxyrrhynchium

Substrates: soil, open humus, rock, rotten logs, tree bases
Habitats: forests, mesic to wet conditions, deep shade to sunny places

CoC: 3
Indicator Status: FAC

New Jersey plants are medium-sized in light green to whitish or brownish in loose tufts. Stems are irregularly or sometimes regularly branched, creeping to arching, and terete-foliate, julaceous or not. Branches are terete-, subcomplanate-, or sometimes distinctly complanata-foliate. Stem leaves are slightly spreading, loosely arranged to occasionally loosely imbricate. Stem leaves are variously concave, broadly ovate to ovate-lanceolate, and gradually tapered to acute or acuminate at apex. Leaf margins variously toothed. The costa is broad, extending 50 to 70% of the leaf length and ends in a terminal spine. Branch leaves are slightly to strongly differentiated. They are typically more elliptic, broadest at or below leaf middle, the base is often asymmetric, and the apex is more shortly acuminate to acute. Branch leaf costa is more strongly toothed toward the tip and the terminal spine is stouter. The seta is rough, red-brown in color, and 1-2.5 cm long. Capsules are inclined to horizontal, red-brown in color, elongate and curved, and 2 mm long.

Species
Oxyrrhynchium hians (Hedw.) Loeske

Oxyrrhynchium hians – Photo by © Michael Lüth

Rhynchostegiums

Substrates: soil, hardwoods, rotten logs, tree bases, rock
Habitats: forests, grasslands, limestone areas, small streams and springs, beds of waterfalls, seepy cliffs

CoC: 5
Indicator Status: FAC

New Jersey plants are medium-sized to large in deep green, light green, or whitish loose tufts or extensive mats becoming brownish or paler green with age. Stems are irregularly branched, creeping, terete- to subcomplanate-foliate. The branches are terete-, complanate-, or subcomplanate-foliate. The stem leaves erect or slightly spreading, gradually reflexed from erect base, imbricate to somewhat spaced. Stem leaves are flat to slightly concave, not or slightly plicate and broadly ovate or suborbicular to ovate-lanceolate with an acuminate or more or less broadly acute apex. Leaf margins are variously toothed. The costa is moderate to somewhat stout extending 40 to 85% of the leaf length and may end with a terminal spine on the underside of the leaf. Branch leaves are similar to stem leaves, though smaller and sometimes narrower. The seta is red-brown and smooth. Capsules are inclined to horizontal, red-brown to brown in color, oblong-cylindric in shape, and weakly curved.

Species

Rhynchostegium aquaticum A. Jaeger

Substrates: rock
Habitats: limestone areas, small streams and springs, beds of waterfalls, seepy cliffs

Rhynchostegium aquaticum - Photo by Keith Bowman

Rhynchostegium serrulatum (Hedwig) A. Jaeger

=*Steerecleus serrulatus*

Substrates: soil, hardwoods, rotten logs, tree bases, rock

Habitats: forests, grasslands

Rhynchostegium serrulatum - Photo by Bob Klips

Sciuro-hypnum

Substrates: soil (wet, mineral, humus, over rock), under tall herb vegetation duff, rich humus base of trees (hardwoods, conifers), wood (decaying) and logs, rock cliffs (temporarily submerged, wet, shaded) and outcrops, granitic boulders, limestone, concrete, deciduous trees (base, trunk)
Habitats: forests (coniferous, exposed or moderately shaded), dry habitats, wet places, swamps

CoC: 6
Indicator Status: FAC

New Jersey plants are small to large in light to deep green tufts, sometimes yellowish, brownish, or rarely brownish red with age. Stems are irregularly to regularly pinnate; creeping, ascending, or arching; and loosely to densely terete- or rarely complanate-foliate, julaceous or not. Branches are somewhat more densely foliate than stem, terete- to complanate-foliate. Stem leaves are erect to slightly spreading and reflexed and loosely arranged to closely imbricate. Stem leaves are concave and indistinctly plicate to not at all plicate; broadly ovate, ovate-lanceolate, or deltoid in shape; and gradually or abruptly tapered, acuminate, acute, or apiculate at the leaf apices. Leaf margins are coarsely toothed to nearly entire. The costa is weak or strong; broad at the base and narrowed toward the tip; extending to the mid-leaf or into the leaf tip; and may end in a small terminal spine on the underside of the leaf. Branch leaves smaller, narrower, costal terminal spine more often present. The seta is red-brown or sometimes cherry red and roughened to almost smooth. Capsules are inclined, horizontal, or pendent; dark red-brown in color; elongate to short-ovate in shape; and straight or curved.

Species

Sciuro-hypnum curtum (Lindberg) Ignatov
=Brachythecium curtum
Substrates: soil rich in humus, logs, mineral soil, tree bases, under tall herb vegetation
Habitats: forest floors, coniferous forests

Sciuro-hypnum oedipodium (Mitt.) Ignatov & Huttunen
=Brachythecium starkii ssp. *oedipodium*
=Brachythecium curtum
=Sciuro-hypnum curtum
Rarity: S1
Substrates: duff, decaying wood, humus, mineral soil, thin soil layers over rock

Sciuro-hypnum plumosum (Hedwig) Ignatov & Huttunen

=Brachythecium plumosum

Substrates: rock along creeks, temporarily submerged, wet, shaded rock cliffs and outcrops, wet soil, bark of tree bases

Sciuro-hypnum plumosum – Photo by © Michael Lüth

Sciuro-hypnum populeum (Hedwig) Ignatov & Huttunen

=Brachythecium populeum

Substrates: rock, granitic boulders, limestone, concrete, base and trunks of deciduous trees, soil

Habitats: exposed or moderately shaded, dry habitats

Sciuro-hypnum populeum – Photo by © Michael Lüth

Sciuro-hypnum reflexum (Starke) Ignatov & Huttunen

=Brachythecium reflexum

Substrates: base of trees (hardwoods, conifers), wood and litter

Habitats: boreal and hemiboreal forests

Sciuro-hypnum starkei (Bridel) Ignatov & Huttunen

=Brachythecium starkei

Substrates: soil, rich humus

Habitats: wet places, swamps, forests

Brachythecium starkei – Photo by © Michael Lüth

Tomenthypnum

Habitats: calcareous to intermediately mineral-rich habitats, mesotrophic fens, associated with calciphiles such as *Alacomnium* spp.

CoC: 9
Indicator Status: OBL

New Jersey plants are large and golden to yellow-green or golden brown in color. Stems pinnate or subpinnate in one plane. Rhizoids typically abundant, although they are sometimes reduced or absent, from proximal abaxial costa surface, forming conspicuous tomentum ove one entire side of stem, strongly branched, smooth, sometimes warty-papillose at base. Stem leaves are erect to erect-spreading and straight or falcate-secund. Stem leaves are strongly plicate and long-lanceolate to ovate-lanceolate in shape with a slender- or long-acuminate apex. Leaf margins are plane or narrowly and tightly recurved and entire or wavy. The costa is single and ending near the leaf apex. Branch leaves are similar to the stem leaves though smaller. The seta is reddish (darker below and lighter above), straight to somewhat flexuose or slightly twisted when dry, and 2 to 5 cm tall. Capsules are inclined to horizontal, oblong-cylindric in shape, and arcuate.

Species

Tomentypnum nitens (Hedw.) Loeske

Rarity: S1/2

Tomentypnum nitens - Photo by Keith Bowman

Bruchiaceae

Bruchia

Substrates: moist soil
Habitats: fields, among grasses

CoC: 4
Indicator Status: FACU

New Jersey plants are small, upright and ephemeral. The leaves are lanceolate to linear-lanceolate from a somewhat broadened ovate or oblong base, 1-2 mm long, apex acute to acuminate, and not contorted when dry. Leaf margins are entire or toothed. The upper leaves have ovate, obovate, or elliptic base and long-subulate above, and about 1 – 3 mm. The costa extends to the just below the leaf tips or just beyond. The seta is short, less than 0.5 mm. Capsules are short-exserted, obovate in shape with a short inflated neck.

Species

Bruchia flexuosa (Schwaegr.) C. Mull.

Rarity: S1/2

Bruchia flexuosa - Photo by Bob Klips

Trematodon

Substrates: Soil, sand, humus
Habitats:

CoC: 4
Indicator Status: FACU

New Jersey plants are small and yellowish and usually somewhat contorted when dry. Leaves are ovate-lanceolate to short- or long-subulate from an ovate or obovate base. Leaf margins are toothed at the apex. The costa extends into the apex ending below the apex, to the tip or beyond and often filling the leaf apex. The seta is 10-30 mm. Capsules are inclined and curved; long-cylindric and strumose at the base; and the neck is at least the length of the urn to as much as 2 to 3 times as long.

Species

Trematodon ambiguous (Hedw.) Hornsch.
Rarity: S1
Substrates: soil, humus

Trematodon ambiguous – Photo by © Michael Lüth

Trematodon longicollis Michx.
Rarity : S1
Substrates: soil, sand


Trematodon longicollis - Photo by Bob Klips

Bryaceae

Bryum

Substrates: soil, soil over rock
Habitats: crevices, nitrogen enriched sites, disturbed habitats

CoC: 1
Indicator Status: FACU

New Jersey plants are white-green to silver-green in gregarious or in dense mats. The stems are typically shorter than 1 cm and strongly rounded julaceous or sometimes gemmiform. The concave leaves are erect when moist. The leaves are ovate to ovate-lanceolate and 0.3 to 1.2 mm long with a broadly rounded to acute apex with a short apiculus which is sometimes present. The leaf bases are typically green and the upper 25% to 50% is hyaline or rarely entirely green. Leaf margins are rarely recurved below and plane above. The costa does not reach the leaf apex. The seta is brown to red-brown and 1 to 2 cm tall. Capsules are red to red-brown, ovate in shape, and 2-3 mm long with a differentiated hypophysis.

Species
Bryum argenteum Hedw.

Bryum argenteum - Photo by Keith Bowman

Gemmabryum

Substrates: soil (calcareous, dry to moist, disturbed, over rock), rotten wood, rock
Habitats: disturbed habitats, earth banks

CoC: 3
Indicator Status: FAC

New Jersey plants are small to large in green, yellow-green, pink, or red turfs or gregarious. Stems are not or strongly branched; gemmiform to evenly foliate; and up to 3 cm in height. The rhizoids are usually few. The leaves are imbricate to loosely set and slightly twisted when dry and spreading when moist. The flat or concave leaves are ovate, ovate-lanceolate, or triangular in shape and less than 3 mm long with a broadly rounded to acuminate apex with an apiculus occasionally present. The margins are plane to strongly revolute and entire to toothed near the apex and may be weakly differentiated. The costa is variable, ending below the apex to beyond the leaf tip as an awn. The seta is usually single, straight or somewhat flexuose, not bent. Capsules are erect, inclined, or nodding; pyriforme or ovate in shape; 1-5 mm long; and the hypophysis is slender or thick.

Species

Gemmabryum caespitosum (Hedwig) J.R. Spence
=*Bryum caespiticium*
Substrates: disturbed soil, earth banks, rotten wood, rock
Habitats: disturbed habitats

Gemmabryum caespitosum - Photo by Bob Klips

Gemmabryum dichotomum (Hedwig) J.R. Spence

=*Bryum dichotomum*

Rarity: S1

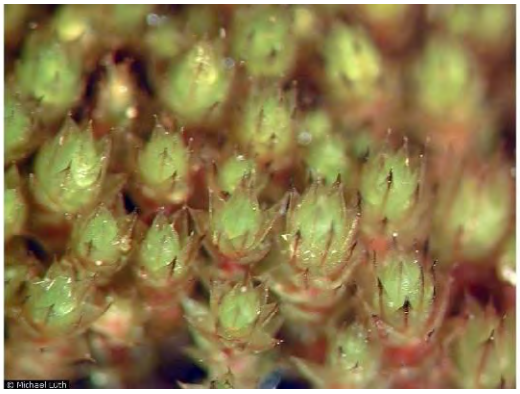
Substrates: dry to moist soil, soil over rock

Gemmabryum dichotomum – Photo by Michael Lüth

Gemmabryum radiculosum (Brid.) J.R. Spence & H.P. Ramsay

Rarity: S1

Substrates: dry disturbed calcareous soil, soil over rock



Gemmabryum radiculosum – Photo by © Michael Lüth

Imbribryum

Substrates: damp shaded siliceous rock, soil in rock crevices (splashed rock)
Habitats: waterfalls, seeps and springs (montane)

CoC: UA
Indicator Status: FAC

New Jersey plants are small to medium-sized in dark red to red-green, rarely entirely green turfs. The stems are often branched, evenly foliate, julaceous with a metallic sheen, and 0.5 to 3 cm tall. There are few rhizoids, although older stems are sometimes densely radiculose. The leaves are rigid, imbricate, and crowded ranging in color from dark red to red-green, though sometimes dark green. The concave leaves are ovate in shape, 1-3 mm long with a rounded to broadly acute apex. Leaf margins are revolute near the base, plane near the apex and entire to finely toothed near the apex. The costa is reddish, not quite reaching the leaf apex or rarely extending to the tip. The seta is more or less straight and red, red-brown, or purple in color. Capsules are nodding, dark red-brown in color, short-pyriform in shape, 2-3 mm long with a short neck.

Species

Imbribryum muehlenbeckii (Bruch & Schimper) N. Pedersen
=Bryum muehlenbeckii
Rarity: S1

Imbribryum muehlenbeckii – Photo by © Michael Lüth

Ptychostomum

Substrates: soil (dry to wet, sandy, organicsoil over rock), rock (calcareous)
Habitats: habitats along streams (calcareous), wetlands, fens

CoC: 6(?)
Indicator Status: FAC

New Jersey plants are small to very large in red, pink, yellow-green, or brown-green turfs. The stems are tufted, comose or evenly foliate, freely branched by subfloral innovations, and 0.5 to 4 cm tall, though they can sometimes reach 12 cm. There are few to many rhizoids. The leaves are weakly to strongly contorted or shrunken when dry and erect to erect-spreading when moist. The flat to concave leaves are ovate, ovate-lanceolate, or orbicular, less than 5 mm long with an obtuse to acuminate apex. The leaf margins are plane or revolute, typically differentiated, and entire to toothed near apex. The costa usually reaches the leaf tip and may extend beyond the apex forming a smooth or toothed awn. The seta is single and straight to flexuose. The capsules are highly variable; suberect, inclined, or nodding; ovate, obovate, pyriforme, clavate, or turbinate in shape; 2-7 mm long with a slender or thick hypophysis.

Species

Ptychostomum bimum (Schreber) J. R. Spence
=*Bryum pseudotriquetrum* (in part)
Substrates: wet soil, soil over rock, rock

Ptychostomum cernuum (Hedw.) Hornschuch
=*Bryum uliginosum*
Rarity: S1
Substrates: wet soil
Habitats: along streams, wetlands, calcareous habitats

Ptychostomum creberrimum (Taylor) J.R. Spence & H.P. Ramsay
=*Bryum lisae* var. *cuspidatum*
Rarity: S1
Substrates: damp to dry soil, soil over rock

Ptychostomum creberrimum - Photo by Bob Klips

Ptychostomum cyclophyllum (Schwgrischen) J. R. Spence
=Bryum cyclophyllum
Rarity: S1
Substrates: wet sandy or organic soil
Habitats: along streams, wetlands

Ptychostomum pendulum Hornsch.
=Bryum algovicum
Rarity: S1
Substrates: dry soil or rock (calcareous)

Ptychostomum pendulum – Photo by © Michael Lüth

Ptychostomum pseudotriquetrum (Hedwig) J. R. Spence & H. P. Ramsay ex Holyoak & N. Pedersen
=Byrum pseudotriquetrum
Substrates: wet soil, soil over rock, rock
Habitats: fens


Ptychostomum pseudotriquetrum - Photos by Bob Klips

Rhodobryum

Substrates: rich soil, rotten logs, tree bases, soil over rock, rock
Habitats: forests, forest edges, (often calcareous) boggy sites

CoC: 6
Indicator Status: FAC

New Jersey plants are large in dark or light green, sometimes red, mats. The stems are 1-5 cm tall, rose-like (rosulate), and often unbranched, though innovations may arise from below the terminal rosette with stolons present. There are few to many rhizoids at the base of the stem or arising in the leaf axils. The flat leaves are strongly contorted and shrunken when dry, erect-spreading when moist; ovate, obovate, or spathulate in shape; and 3-10 mm long with an acute, broadly acute, or cuspidate apex. Leaf margins are variously differentiated, revolute basally, to mid leaf or to near the apex, and toothed from mid leaf to apex. The costa is occasionally ending before leaf tip, but more often extending to the leaf tip or beyond forming a hair-point or apiculus that is often recurved. There are 1-8 setae per perichaetium and straight to slightly flexuose. Capsules are inclined to nodding, oblong to cylindric in shape, 3-5 mm long with a differentiated but very short hypophysis.

Species
Rhodobryum ontariense (Kindb.) Kindb.

Rhodobryum ontariense - Photos by Keith Bowman

Rosulabryum

Substrates: moist shaded soil, soil banks, rotting wood

CoC: 4
Indicator Status: FAC

New Jersey plants are small in bright green, low turfs or gregarious. The stems are 0.5-1.5 cm tall and distinctly rose-like (rosulate) with short innovations. The leaves of the main rosette and innovations are similar. Both leaf types are weakly concave, obovate in shape and 0.5-2.5 mm with an acute apex. The leaves are spirally twisted around the stem when dry and erect-spreading when moist. Cells of the leaf margin are distinctly differentiated, recurved to the middle of the leaf, and distinctly toothed near the apex. The costa is slender and extends beyond the leaf tip and greatly so forming a long awn that is sometimes hyaline. Capsules are inclined, red-brown in color, cylindric to elongate-pyriform in shape, and 3-5 mm long.

Species

Rosulabryum capillare (Hedwig) J. R. Spence

=Bryum capillare

Rarity: S1/2

Rosulabryum capillare – Photo by © Michael Lüth

Buxbaumiaceae

Buxbaumia

Substrates: decaying wood, humus, shallow acid soil and soil depressions on rock outcrops
Habitats: well-illuminated to somewhat shaded sites

CoC: 7 (?)
Indicator Status: FACU

New Jersey plants are microscopic and arising from a persistent protonema. The plants are best recognized by the sporophyte. The setae are erect, roughened, red-brown in color when mature, 4-11 mm long, and bulging where it joins the oblique capsule. This species is unlikely to be seen unless the sporophytes are present. Capsules, when mature, are broadly ovoid, 3-7 mm long and nearly as wide, oblique or nearly at right angles to seta. The capsules are rich, glossy, chestnut brown and the upper face is flattened and sharply differentiated from lower face by a dark brown ridge.

Species
Buxbaumia aphylla Hedw.

Buxbaumia aphylla - Photos by Keith Bowman

Climaciaceae

Climacium

Substrates: soil (mineral, sandy to clay, organic)
Habitats: mesic or hydric microhabitats, along and in streams, margins of ponds and lakes, swamps, fens, seepages, upland depressions

CoC: 3
Indicator Status: FAC

New Jersey plants are dendroid, coarse, glossy or dull. The leaves are erect to erect-spreading, loosely imbricate when dry or moist. The leaves are concave and deeply plicate and ovate in shape with a cordate base and an obtuse or acute apex that is sometimes short-apiculate. Stem leaf margins are nearly entire to toothed near the apex, while branch leaves are toothed nearly to the base, coarsely toothed in the upper 30% to 50% of the leaf. Paraphyllia are abundant. The costa is single. Set orange-brown to reddish. Capsule are erect and red-orange to red-brown in color. Specimens typically identified as *C. kindbergii* are prostrate or decumbent and not dendroid-erect in habit and may represent a form of *C. americanum*.

Species

Climacium americanum Brid.
Includes specimens identified as *Climacium kindbergii*
Substrates: mineral, sandy to clay soil
Habitats: mesic or hydric microhabitats, along and in streams, margins of ponds and lakes, swamps, fens, seepages, upland depressions

Climacium dendroides (Hedw.) Web. & Mohr
Rarity: S1
Substrates: organic substrates
Habitats: mesic or hydric microhabitas, along and in streams, margins of ponds and lakes, swamps, fens, seepages, upland depressions

Climacium dendroides - Photo by Keith Bowman

Cryphaeaceae

Cryphaea

Substrates: twigs, branches, trunks (shrubs and trees), logs, rock
Habitats: humid forests

CoC: 5
Indicator Status: FACU

New Jersey plants are small and green to glaucous or brownish green. The stems have secondary stems with prostrate bases and erect or spreading near the apices to spreading and ascending. The branches are short to elongate and simple. The colonies are recognized by the dull, wiry aspect of the mostly inconspicuous simple branches standing out from the substrate. The leaves are about 1 mm long, tightly imbricate when dry and usually wide-spreading when moist. Leaf margins are plane or somewhat recurved near the base. Leaf cells can be smooth or roughened by upturned cell ends on the lower side of the leaf especially near the leaf tip and the upper leaf surface is typically smooth. The seta is very short and capsules are immersed. The costa ends mid leaf or in base of acumen and laterally spurred with a tip that is more or less split in two.

Species

Cryphaea glomerata Schimper ex Sullivant in A. Gray
Rarity: S1

Dicranaceae

Dichodontium

Substrates: moist soil, rock (calcareous or acid)
Habitats: banks, wet cliffs, near streams

CoC: 7
Indicator Status: FAC

New Jersey plants forming mats, cushions, or loosely caespitose, dull yellow or green to dark green. The stems are erect and simple to sparingly branched standing 1.5-8 cm tall. The stems are lightly felted with rhizoids to radiculose below. The leaves are straight and slightly undulate and more or less strongly and irregularly contorted or crisped with incurved apices when dry and erect-spreading to squarrose from an erect base when wet. The concave leaves are 1-4 mm long and narrowly to broadly oblong- or ovate-lanceolate or strap-like (ligulate) with an acute to rounded-obtuse apex. The costa can be narrow or broad, roughed by papillae or smooth, and ends before the leaf apex. The leaf margins are variously recurved in the lower half and sometimes to the apex and smooth near the insertion by strongly roughened by papillae, but not toothed, near the apex. The seta is single and yellow becoming red-brown with age,erect, and 9-20 mm tall. The capsules are variously green, yellow to orange-green and between 1-2 mm long and smooth when dry.

Species

Dichodontium pellucidum (Hedw.) Schimp.

Rarity: S1

Dichodontium pellucidum – Photos by © Michael Lüth

Dicranella

Substrates: soil (wet,calcareous, sand, clay, or peat, covering upturned roots)
Habitats: disturbed sites (roadside ditaches) along woodland banks (shaded or open, trails, roads, streams), crevices of cliffs

CoC: 2
Indicator Status: FACU

New Jersey plants are green to yellowish green, or sometimes reddish in loose to dense tufts. The stems typically range from 0.5-5 cm in height, sometimes up to 11 cm, erect and can be either simple or forked. Rhizoids are common at the base of branches and stems. The leaves are erect-spreading or appressed to squarrose, straight or falcate-secund, and occasionally curled or crispate when dry. The leaves are concave to keeled, or rarely flat and short- to long-lanceolate with acute to obtuse apices. Leaf margins are plane to recurved and entire below and variously toothed above. The costa is single and may extend to just below the apex to beyond the leaf tip. The costa can be smooth or variously roughed while the leaf cells may be bulging or not. The seta is solitary, yellow or red becoming brown with age and smooth, elongate, erect or flexuose becoming twisted when dry. Capsules are erect or inclined, usually ovoid, oblong, cylindric, or sometimes subglobose in shape, straight or curved, smooth or variously furrowed when dry and often contracted below the mouth.

Species

Dicranella cerviculata (Hedw.) Schimp.
Rarity: S1
Substrates: sand, clay, or peaty soil,
Habitats: disturbed sites (roadbanks)

Dicranella cerviculata – Photo by © Michael Lüth

Dicranella heteromalla (Hedw.) Schimp.

Substrates: soil of shaded banks, soil covering upturned roots
Habitats: along woodland trails

Dicranella heteromalla - Photo by Bob Klips

Dicranella rufescens (With.) Schimp.

Rarity: S1
Substrates: wet soil
Habitats: banks of roads and streams

Dicranella schreberiana (Hedwig) Hilferty ex H. A. Crum & L. E. Anderson
=Dicranella schreberiana var. *robusta*

Rarity: S1
Substrates: wet soil or banks
Habitats: roadside ditches, crevices of cliffs

Dicranella schreberiana – Photo by © Michael Lüth

Dicranella varia (Hedw.) Schimp.

Rarity: S1/2

Substrates: wet, calcareous soil, especially clay

Habitats: open, disturbed places (roadside ditches)

Dicranella varia – Photo by © Michael Lüth

Dicranum

Substrates: humus, soil (exposed, sandy, peaty), soil and humus over sandstone and limestone (boulders), rock outcrops (limestone or acidic), bluffs, cliff faces, rotting wood (stumps and logs), coniferous or deciduous trees (trunks, bases), exposed tree roots, logs and bases of trees
Habitats: woodlands (open to exposed, dry to mesic, coniferous, deciduous), swamps, bogs, fens , marshes (*Sphagnum* hummocks), along streams, rock outcrops, cliffs, bluffs (dry), margins of lakes

CoC: 5
Indicator Status: FAC

New Jersey plants are yellowish green to dark green in dull or shiny tufts. The stems are erect, simple or forked and typically 0.5-12 cm tall, but may reach 18 cm. The stems are densely felted with white or reddish brown rhizoids, though the rhizoids are sometimes nearly absent. The rhizoids arise from the bases of branches or are scattered along stems. The leaves are usually lanceolate or rarely ovate with a subula that is keeled to tubulose and acute to obtuse apices. The leaves are erect-appressed or variously spreading and straight, and generally curved in the same direction (falcate-secund). The leaves are wavy (undulate), irregularly folded (rugose), or smooth and weakly curled, or crispate when dry. Some species have deciduous leaf tips that may serve as a means of asexual reproduction. Leaf margins are plane to incurved or involute and entire to toothed above and entire near the base. Leaf cells are smooth, bulging, or roughened by papillae or projecting cell ends. The costa single, extending to just before the leaf apex or beyond, smooth or toothed on under side of the leaf, and sometimes with 2-4 ridges ridges. There are 1 to 6 setae per perichaetium, cylindric in shape, straight or curved, and smooth, striate or furrowed when dry.

Species

Dicranum condensatum Hedw.

Substrates: exposed sandy soil, over sandstone and limestone
Habitats: pine woods

Dicranum flagellare Hedw.

Substrates: rotting wood (stumps and logs), base of trees, exposed tree roots, soil or humus over boulders

Habitats: mesic woods, (occasional) swamps and bogs

Dicranum flagellare - Photo by Keith Bowman

Dicranum fulvum Hook.

Substrates: sandstone, rock outcrops (limestone or acidic), bluffs, cliff faces, boulders, (rarely) bases of tree trunks, fallen trees and logs

Habitats: deciduous woodlands, especially along streams

Dicranum fulvum - Photo by Bob Klips

Dicranum fuscescens Turn.

Rarity: S1

Substrates: coniferous or deciduous tree trunks and bases of trees, rotten logs, stumps, soil, boulders, humus

Habitats: rock outcrops, cliff shelves, woodlands, (occasional) bogs

Dicranum fuscesens – Photos by © Michael Lüth

Dicranum montanum Hedw.

Substrates: rotting stumps and logs, tree bases (usually deciduous trees), occasionally soil or humus over rock, (boulders and cliff ledges)

Habitats: dry to mesic woods, rarely swamps

Dicranum montanum - Photo by Bob Klips

Dicranum muehlenbeckii Bruch & Schimp.

Rarity: S1

Substrates: humus and sandy soil (over boulders, among rocks)

Habitats: cliffs, bluffs, open woods, exposed sites

Dicranum muehlenbeckii – Photo by © Michael Lüth

Dicranum ontariense Peters.

Rarity: S1

Substrates: humus, soil, or soil over rock, rotten logs or stumps (rarely)

Habitats: mesic to dry coniferous woods, (occasional) swamps and bogs

Dicranum ontariense – Photo by © Michael Lüth

Dicranum polysetum Sw.

Rarity: S1/2
Substrates: humus, soil over acidic or calcareous rock, and decaying wood
Habitats: deciduous or coniferous forests (more often), bogs, fens, and swamps

Dicranum polysetum - Photo by Bob Klips

Dicranum rhabdocarpum Sull.

This species is not likely to be found in New Jersey and may represent misidentified *D. montanum* or *D. viride*
Rarity: S1
Substrates: soil, soil over rock, peaty soil or rotten wood

Dicranum scoparium Hedw.

Substrates: soil, humus, humus over rock, decaying stumps and logs, tree bases
Habitats: dry to mesic woodlands, bogs, fens and swamps

Dicranum scoparium - Photo by Keith Bowman

Dicranum spurium Hedw.

Substrates: sandy soil, decayed logs, acidic rock, humus

Habitats: exposed bluffs or outcrops in pine woods, sometimes bogs

Dicranum spurium - Photo by Bob Klips

Dicranum undulatum Brid.

Rarity: S1/2

Substrates: rocks, soil, rotten wood, or humus

Habitats: rock outcrops and cliffs, mesic woods, dry bluffs, (usually) wet habitats, such as bogs (*Sphagnum* hummocks), fens, swamps, marshes, margins of lakes

Dicranum viride (Sull. & Lesq.) Lindb.

Rarity: S1

Substrates: commonly growing on the base of trees (usually deciduous but sometimes coniferous, especially *Thuja*), rotten logs, stumps, rarely soil and acidic or limestone rock

Dicranum viride – Photo by © Michael Lüth

Paraleucobryum

Substrates: soil over noncalcareous boulders and cliffs, (occasionally) tree trunks, stumps, and rotten logs

CoC: 6
Indicator Status: FACW

New Jersey plants are whitish green, grayish green or yellowish green and glossy in loose to dense tufts. The stems are erect, simple or branched and 1-4 cm tall. Rhizoids are found on stems below the shoot apex among leaves. The leaves are awl-shaped (subulate) to narrowly lanceolate, gradually acuminate and subtubulose in the upper portion of the leaf and the apex is sometimes deciduous. The leaves are erect-spreading to curved in one direction (falcate-secund), especially at the stem tips, and are little changed when dry. The leaf margins are plane or incurved, and toothed from below the leaf middle to the apex. The costa is single extending to the leaf tip and fills from 50% to almost 70% of the leaf base and all of the subula. The perichaetial leaves have a broad base and are abruptly narrowed to a long awn. The yellowish brown seta is primarily single, although rarely there can be 2 per perichaetium. The seta is erect, straight to flexuose and twisted when dry. Capsules are erect to somewhat inclined, cylindric in shape, straight, smooth, and irregularly furrowed when dry.

Species

Paraleucobryum longifolium (Ehrhart ex Hedwig) Loeske

Rarity: S1

Paraleucobryum longifolium – Photo by © Michael Lüth

Rhabdoweisia

Substrates:
Habitats: dampish, shaded cliffs

CoC: 9
Indicator Status: FAC

New Jersey plants are perennial in short, dull green to brownish, loose tufts. The stems are erect standing 0.5-1 cm tall, though sometimes taller and forked by innovations. The red-brown rhizoids are located at base of the stem. Leaves are 2-3.5 mm long, narrowly lanceolate and gradually tapering to an acute apex. The leaves are crisped when dry and keeled, strongly divergent when moist. The leaf cells are smooth. The costa extends to just below the leaf apex (subpercurrent). Leaf margins are usually recurved and toothed with small teeth toward the leaf tip. The yellow seta is solitary are smooth and erect standing 2-4.5 mm. Capsules are brown to yellow-brown, erect and exserted, 0.7 – 1 mm long, ovoid to oblong-cylindric in shape, symmetric, and contracted below the mouth and deeply 8-furrowed when dry and empty.

Species

Rhabdoweisia crispata (Dickson ex Withering) Lindberg

Rarity: S1

Diphysciaceae

Diphyscium

Substrates: soil banks, soil
Habitats: forest floors

CoC: 3
Indicator Status: FACU

New Jersey plants dark green to brownish, dull in hard tufts. The stems are unbranched, erect standing only about 1 mm tall and strongly radiculose. Leaves are lingulate in shape with a blunt apex and range from 0.5-4 mm long. The leaves are crisped and imbricate when dry. Leaf cells roughened to smooth. The costa extending to near the leaf apex. Leaf margins are entire or weakly toothed with papillae. Perichaetial leaves with a smooth or spinulose awn often longer than the lamina. Capsules are broadly ovoid and 2-4 mm long.

Species
Diphyscium foliosum (Hedw.) Mohr.

Diphyscium foliosum - Photo by Keith Bowman

Disceliaceae

Discelium

Substrates:
Habitats: moist silty to fine sandy banks of somewhat shaded sites

CoC: 4
Indicator Status: FAC

New Jersey plants are recognized by a persistent green protonema bearing minute perichaetia and perigonia. The plants gregarious to widely spaced and only obvious when the sporophytes are present. The red-brown seta is smooth. Capsules are inclined to horizontal, subglobose to short-cylindric in shape.

Species

Discelium nudum (Dicks.) Brid.
Rarity: S1

Ditrichaceae

Ceratodon

Substrates: (colonizer) open soil, rock ledges, tree bases, roof tops, old wood
Habitats: various habitats, following fires

CoC: 1
Indicator Status: FAC

New Jersey plants are highly variable in color including green to dark green, brownish green, light green, or yellow-green, and tinged reddish brown or purple in loose to dense tufts, turfs, or mats. The stems are 0.2-4 cm long and often branched. The papillose rhizoids are located at the base of the stem. The leaves are slightly spreading, contorted or somewhat crisped and rarely straight when dry. Leaf shape is highly variable and can be lanceolate, ovate-lanceolate, triangular-lanceolate, or elliptical to ovate and somewhat concave. Leaf margins are recurved from the base to near the apex or rarely plane and irregularly toothed or smooth near the leaf apex. The costa extends to just below the apex (subpercurrent) to beyond the apex (excurrent), and sometimes as long, smooth awn. The seta is red, purplish, yellow, or yellow-orange, erect, elongate, and twisted when dry. Capsules are dark red to reddish or purplish brown to pale brown, pale yellow or yellow-orange. The capsules are exserted, erect to inclined or horizontal, oblong-ovoid to oblong-cylindric or cylindric in shape, and often somewhat asymmetric and deeply furrowed, smooth to strongly grooved or furrowed when dry and usually swollen on one side at the base (strumose).

Species
Ceratodon purpureus (Hedw.) Brid.

Ceratodon purpureus - Photo by Bob Klips

Cleistocarpidium

Substrates: wet soil, sand
Habitats: swamps

CoC: 5
Indicator Status: FACW

New Jersey plants are yellow-green in loose tufts. The stems are 0.3-0.8 cm long and simple with sparse rhizoids. The leaves are loosely erect when dry. Leaves are awl shaped (subulate) from an ovate-lanceolate to narrowly obovate base. The leaf margins are typically plane and entire, although toothed serrulate along the subla. The costa extends beyond the leaf apex (excurrent). The leaf subula is flexuose and smooth. The seta is short and erect. Capsules lack an operculum (cleistocarpous), ovoid broader at the base in shape, and immersed.

Species

Cleistocarpidium palustre (Bruch & Shimper) Ochyra & H. Bednarek -Ochya
=*Pleuridium palustre*
Rarity : S1

Cleistocarpidium palustre – Photo by © Michael Lüth

Ditrichum

Substrates: (pioneer) along roads, banks (moist, sand, clay, gravel), often in clearings, soil on upturned stumps, crevices of sandstone cliffs
Habitats: wooded clearings, trails, roads and other often disturbed habitats (dry, open or partly shaded), sometimes in cliff crevices

CoC: 2
Indicator Status: FACU

New Jersey plants form loose to dense tufts that are green to yellowish green near the apex and yellow-brown to brown below. The stems are typically short, but may reach 2 cm or more in height. The stems are simple or can sometimes have a few branches. Rhizoids are found at base of the stem. The leaves are rigid to flexuose or sometimes somewhat curved (falcate) when dry. Leaf margins are entire throughout or toothed near the apex. The costa extends to just below the apex or beyond and occupies most of the subula and from 1/6 to 1/3 the width of the leaf base. The leaves are smooth or rarely roughened. The seta is pale yellow to dark reddish brown, erect, elongate, or flexuose. Capsules are exserted, mostly erect and symmetric or sometimes more or less inclined, ovoid to cylindric in shape, and curved (arcuate).

Species

Ditrichum ambiguum Best
=*Ditrichum tortuloides*
Rarity: S1
Substrates: moist sandy sometimes clay banks, soil on upturned stumps, crevices of sandstone cliffs, often in clearings along roads.

Ditrichum lineare (Sw.) Lindb.
Substrates: (pioneer) bare clay, sandy or gravely soil banks
Habitats: wooded clearings, trails, roads and other often disturbed habitats

Ditrichum lineare – Photo by © Michael Lüth

Ditrichum pallidum (Hedw.) Hampe

Substrates: sandy or clay soil,

Habitats: dry, open or partly shaded habitats

Ditrichum pallidum - Photo by Bob Klips

Ditrichum pusillum (Hedw.) Hampe

Substrates: bare, disturbed calcium-free clay, sandy or gravely soil banks,

Habitats: disturbed habitats, along roads and trails, and sometimes in cliff crevices

Pleuridium

Substrates: soil (bare, wet, sand; forming tufts)
Habitats: open spaces of scrub oak association, roadside ditches and moist habitats, open weedy habitats, old- fields, creek bottoms, openings in woods

CoC: 3
Indicator Status: FAC

New Jersey plants are gregarious to loosely tufted and yellow-green. The stems are 0.3-0.7 cm tall and simple or branched. The rhizoids are found at the base of the stem. The leaves are erect-spreading or appressed when dry. The lower leaves are linear to triangular (deltoid) and the upper leaves are oblong to lanceolate with awl-shaped (subulate) to acuminate tips. Leaf margins are plane and slightly differentiated, though it may not be observable in the field. The leaf surface is sometimes roughened on the lower surface. The seta is short, erect or curved. Capsules are orange to brownish, erect and immersed, ovoid to elliptical in shape and lack an operculum (cleistocarpous).

Species

Pleuridium ravenelii Aust.
Rarity : S1
Substrates: bare sandy soil
Habitats: open spaces of scrub oak association

Pleuridium subulatum (Hedw.) Rabenh.
Substrates: wet sandy soil (tufts)
Habitats: roadside ditches and moist habitats

Pleuridium subulatum - Photo by Bob Klips

Pleuridium sullivantii Aust.
Rarity : S1
Substrates: sandy soil
Habitats: open weedy habitats, old- fields, creek bottoms, openings in woods, disturbed roadside habitats

Saelania

Substrates: soil
Habitats: steep banks (often protected by overhangs), roadsides, sheltered rock crevices

CoC: 4
Indicator Status: FACU

New Jersey plants are glaucous bluish green or sometimes yellowish green and tufted. The stems are simple or branched and typically short, but may reach 1.5 cm tall. The rhizoids are found at the base of the stem. The leaves are somewhat flexuose or contorted when dry and narrowly lanceolate, gradually tapering to a point (acuminate). Leaf margins are plane or narrowly recurved and entire below and irregularly toothed above, often doubly toothed. The costa is single extending to just below the leaf tip (percurrent) to just beyond (short-excurrent) and filling about 1/5 to 1/3 the width of leaf base. The leaf cells are smooth. The seta is yellow or yellow-brown, elongate, and erect. Capsules are exserted, yellow-brown, erect and symmetric, cylindric in shape, and more or less longitudinally plicate when dry and empty.

Species

Saelania glaucescens (Hedw.) Broth.

Rarity : S1

Saelania glaucescens – Photo by © Michael Lüth

Encalyptaceae

Encalypta

Substrates: calcareous soil and rock
Habitats: crevices and ledges

CoC: 7
Indicator Status: FACU

New Jersey plants are small to medium-sized, and frequently growing close together (gregarious). The stems are irregularly branched and occasionally the rhizoids form a dense layer on the stem. The leaves are oblong, elliptic, narrowly spatula-shaped (spathulate) or occasionally lanceolate with an apex that is broadly acute to rounded, with a small point (mucronate) to hair-pointed, and occasionally hooded (cucullate). Leaf margins are plane to weakly recurved on one or both sides and entire with a weak border. The costa is single extending to just below the apex (subpercurrent) to beyond (long-excurrent) in a long, smooth, hyaline awn. The leaf cells are roughened by papillae on one or both surfaces. The seta is brown to red or dark red, elongate, and smooth. Capsules are generally long exserted, but may be only slightly emergent, erect to inclined, cylindric in shape, and smooth or distinctly furrowed.

Species
Encalypta procera Bruch
Rarity: S1

Encalypta procera – Photo by Keith Bowman

Entodontaceae

Entodon

Substrates: bark at base (deciduous), rotten wood (logs, stumps), rock, soil, humus
Habitats: deciduous forests (dry)

CoC: 3
Indicator Status: FAC

New Jersey plants are medium-sized to moderately large in lustrous extensive mats. The stems are creeping and irregularly branched to subpinnate. The branches are relatively short, cylindrical (terete-foliate) or flattened (complanate-foliate). The leaves are oblong-lanceolate to oblong-ovate, and usually not pleated (plicate), although they may be slightly plicate in *E. brevisetus*. The seta is single. Capsules are yellow- to red-brown, cylindric in shape, and typically erect.

Species

Entodon brevisetus (Hook. & Wils.) Lindb.
Rarity: S1
Substrates: bark at base of hardwood trees, logs, stumps, rock

Entodon cladorrhizans (Hedw.) C. Mull.
Rarity: S1/2
Substrates: rotten wood, bark at base of trees, soil, humus, rock
Habitats: dry, deciduous forests

Entodon compressus (Hedw.) C. Mull.
Rarity: S1
Substrates: bark at base of trees, logs, stumps, rock, soil

Entodon seductrix (Hedw.) C. Mull.
Substrates: rotten wood, bark at base of trees, soil, rock,
Habitats: dry hardwood forests

Entodon seductrix - Photo by Bob Klips

Ephemeraceae

Ephemerum

Substrates: soil (moist to dried, disturbed), rotting wood (occasional)
Habitats: bogs (occasional), old fields, roadsides, mixed forests, basic habitats, meadows, pastures, sides of ditches and ravines, moist paths, swamps, disturbed, partly sunny areas

CoC: 3
Indicator Status: FAC

New Jersey plants are leafy ephemerals less than 3 mm tall, solitary, scattered, or gregarious on sparse or abundant persistent protonemata. The stems are absent. Leaves scarcely contorted when dry. The costa is well-developed, although it is generally absent or weak in *E. serratum*. The leaf cells are usually roughened by papillae. Capsules are more than 0.5 mm long, ovoid and distinctly apiculate in shape, and lack an operculum (cleistocarpous).

Species

Ephemerum cohaerens (Hedwig) Hampe
Substrates: moist or drying disturbed soil
Habitats: bogs (occasionally)

Ephemerum cohaerens - Photo by Bob Klips

Ephemerum crassinervium (Schwaegr.) Hampe
Rarity: S1
Substrates: moist drying disturbed soil
Habitats: old fields, roadsides, mixed forests

Ephemerum serratum (Hedw.) Hampe

Rarity: S1

Substrates: drying and dried soil

Habitats: basic habitats, meadows, pastures

Ephemerum serratum- Photo by © Michael Lüth

Ephemerum spinulosum Bruch & Schimp.

Rarity: S1

Substrates: moist or drying soil, rotting wood (occasional)

Habitats: sides of ditches and ravines, moist paths, old fields, swamps, disturbed, partly sunny areas

Micromitrium

Substrates: soil (bare, unfertilized)
Habitats: drying or dried ponds, edges of lakes or streams, open forests (partial shade), sparsely vegetated turf, old fields, moist or swampy woods

CoC: 3
Indicator Status: FAC

New Jersey plants are green, pale-yellow, or brown leafy ephemerals growing solitary, scattered, or gregarious on a sparse or abundant protonemata with upright, aerial, determinate branches. The stems are absent or present usually to 1 mm in height, but may extend to almost 4 mm in *M. synoicum*. Rhizoids are few or absent. The leaves are usually somewhat shriveled or contorted when dry. The costa is typically absent, but occasionally suggested by a few median cells with thick walls or by a short and indistinct double layer beyond the middle. Capsules are less than 0.4 mm long, golobose or subglobose in shape, without a multicellular apiculus, and lacking an operculum (cleistocarpous), or dehiscing along a ring of differentiated cells at or above the equator.

Species

Micromitrium tenerum (Bruch & Schimper) Crosby
=Micomitrium austinii
Rarity: S1
Substrates: bare soil
Habitats: old fields, drying ponds, moist or swampy woods, banks of streams

Micromitrium megalosporum Aust.
Rarity: S1
Substrates: unfertilized bare soil
Habitats: partial shade, sparsely vegetated turf

Micromitrium synoicum (James) Aust.
Rarity: S1
Substrates: bare soil
Habitats: drying or dried ponds, edges of lakes or streams, open forests

Fabroniaceae

Fabronia

Substrates: bark of trees, rock
Habitats:

CoC: 4
Indicator Status: FACU

New Jersey plants are very small, often in green, yellow-green, or gray-green silky mats. The stems are prostrate. The leaves are loosely appressed when dry and spreading when moist. The concave leaves are ovate to oblong-lanceolate, or rarely lanceolate with a variable apex from short (acute) to long pointed (acuminate), an awl-shaped tip to hair-point, or rarely blunt. The margins are plane and variously toothed (denticulate, dentate, or ciliate-dentate) or rarely entire. The costa is single and extending from 30% to 50% of the leaf length. The seta is single, light yellow, erect, and smooth. Capsules are 0.3 -1 mm long and ovoid to pyriforme in shape.

Species

Fabronia ciliaris (Brid.) Brid.

Rarity: S1

Fabronia ciliaris – Photo by © Michael Lüth

Fissidentaceae

Fissidens

Substrates: soil (bare, disturbed, damp, shaded, clay), around bases of trees, decaying wood, dripping limestone and sandstone rocks and boulders (subject to spray), stones and rocks (both acidic and basic), bases of trees, humus, bricks (infrequent), granite
Habitats: seepage areas, along streams (ravines, sometimes inundated, wooded), near waterfalls (sometimes inundated, often near the high-water level), meadows (moist), shaded sites, open and in woods, along paths, roadside banks, and waterfalls, flowing and non-flowing water, swamps, fens, coastal estuaries

CoC: 5
Indicator Status: FAC

New Jersey plants are pale to dark green, although sometimes becoming brownish to blackish especially in older portions. Plants are tiny to robust and may be scattered or in dense mats. Stems may have one or two forms, erect or horizontal and may be branched or unbranched. Rhizoids are found at the stem base or in the leaf axils. The leaves are arranged in two rows (distichous), sheath the stem, and consist of two vaginant laminae that clasp the stem. The ventral lamina is located above the vaginant laminae and a dorsal lamina that occupies the length of the leaf opposite the vaginant and ventral laminae. Leaves are arranged in few to numerous pairs, either pinnately or palmately arranged, and they change only a little to strongly crispate when dry. Leaves are ovate to linear-lanceolate and the vaginant laminae are mostly acute and may be equal and ending on or near margin or unequal with the minor lamina ending between costa and margin. The vaginant laminae of perichaetial leaves are often rounded and free in the upper portions or narrowed and ending on or near costa. Leaf margins entire to toothed (serrate) and may be differentiated. The costa is usually distinct, though it may be obscured, and variable in length from absent or nearly so to extending beyond the leaf apex (short-excurrent). The cells can be smooth (plane), bulging (mammillose), or variously roughened (papillose, or pluripapillose). The seta is yellow or reddish when young becoming darker with age, 1-2 rarely more, smooth or sometimes roughened, and straight or flexuous. Capsules are usually exserted, ovoid to cylindric in shape, and smooth.

Species

Fissidens adianthoides Hedw.

Substrates: soil, around bases of trees, decaying wood, dripping limestone and sandstone rocks and boulders
Habitats: seepage areas, along streams, near waterfalls, meadows


Fissidens adianthoides – Photo by © Michael Lüth

Fissidens bryoides Hedw.

Substrates: soil, stones and rocks (both acidic and basic) infrequently around bases of trees

Habitats: moist, shaded sites, along streams (sometimes inundated)


Fissidens bryoides – Photo by © Michael Lüth

Fissidens bushii (Cardot & Theriot) Cardot & Theirot

Substrates: bare or disturbed clayey soil, (infrequently) on rocks, stones, tree bases

Habitats: open and in woods, along paths, roadside banks, along streams, ravines

Fissidens closteri Aust.

Rarity: S1

Substrates: rocks

Habitats: along streams in woods (may be subject to flooding)

Fissidens dubius P. Beauv.

Rarity: S1/2
Substrates: soil and humus, bases of trees, decaying wood, rocks and boulders
Habitats: moist, shaded sites

Fissidens dubius – Photo by © Michael Lüth

Fissidens exilis Hedwig

Substrates: bare, damp soil
Habitats: shaded banks and in seepage areas (may be introduced)

Fissidens fontanus (B. Pyl.) Steud.

Rarity : S1/2
Substrates: attached to various substrata
Habitats: stagnant and flowing water, coastal estuaries

Fissidens hallianus (Sull. & Lesq.) Mitt.

Rarity: S1
Substrates: over limestone, granite, and bases of trees
Habitats: flowing and non-flowing water

Fissidens obtusifolius Wils.

Rarity: S1
Substrates: limestone and limestone bearing sandstone, bricks (infrequent)
Habitats: along streams and waterfalls (sometimes inundated, often near the high-water level)

Fissidens obtusifolius - Photo by Bob Klips

Fissidens osmundioides Hedw.

Rarity: S1/2

Substrates: rocks (acidic and basic) and boulders (subject to spray), soil and humus, around bases of trees

Habitats: moist, shaded sites, seepage areas, meadows, swamps, fens

Fissidens subbasilaris Hedw.

Rarity: S1

Substrates: bases of trees, rocks (mostly limestone), decaying wood (infrequent)

Fissidens subbasilaris - Photo by Bob Klips

Fissidens taxifolius Hedw.

Substrates: damp, shaded soil, humus, and rocks

Fissidens taxifolius - Photo by Bob Klips

Fontinalaceae

Dichelyma

Substrates: trunks and branches of trees and shrubs, sticks, roots, rock, boulders
Habitats: along edges of lakes, ponds, streams, seasonally submerged depressions in woods

CoC: 7
Indicator Status: OBL

New Jersey plants are small to large, semi-aquatic, and glossy. The stems are prostrate or pendent. Rhizoids may be unbranched or irregularly branched and arise from initials on the lower side of the leaf or at the leaf insertion. The leaves are long, narrow, and keeled-conduplicate and may be distant or crowded. The leaves are lanceolate to linear-lanceolate with an obtuse, short tapered (acute), or long tapered filiform apex. Leaf margins are plane or very narrowly recurved and entire or obscurely toothed below and more distinctly toothed above. The costa extends to just below the leaf apex (subpercurrent) or beyond (long-excurrent). The seta is 3-20 mm long. Capsules are immersed or emergent and oval, oval-oblong, subcylindric, or cylindric in shape.

Species

Dichelyma capillaceum (With.) Myr.
Rarity: S1

Fontinalis

Substrates: rock, sticks, logs, tree roots, boulders, base of trees, twigs
Habitats: streams, sloughs, swamps, pools, ponds, lakes, streams, rivers, summer dry streams, along or submerged in fast moving streams, ditches, floodplains

CoC: 7
Indicator Status: OBL

New Jersey plants are small to large, glossy. The stems are trailing. Rhizoids are unbranched or sparsely and irregularly branched and found on the primary stems and at base of secondary stems, and may arise in clusters on the lower side of the leaf to the leaf insertion. The keeled, conduplicate, concave, or plane leaves are closely or distantly spaced. Leaves are variable in shape including ovate, oblong-ovate, oblong-lanceolate, ovate-lanceolate, lanceolate, narrowly lanceolate, or linear. Leaf margins are sometimes broadly reflexed at the base, plane, erect, or involute or nearly so. The seta is very short, extending only 0.1-0.3 mm. Capsules are immersed to slightly emergent and ovoid to subcylindric in shape.

Species

Fontinalis antipyretica Hedw.
=*Fontinalis antipyretica* var. *gigantea*
Rarity: S1
Substrates: rock, sticks, logs, roots
Habitats: in streams, ponds, pools, ditches, swamps, floodplains, seasonally dry

Fontinalis antipyretica – Photo by © Michael Lüth

Fontinalis dalecarlica Schimper in P. Bruch and W. P. Schimper
Rarity: S1/2
Substrates: rock, tree roots
Habitats: along or submerged in fast moving streams, pools, lakes

Fontinalis hypnoides Hartm.
Rarity: S1
Substrates: rock, boulders, base of trees, roots, sticks
Habitats: in streams, swamps, lakes, ponds

Fontinalis novae-angliae Sull.

=Fontinalis novae-angliae var. *cymbifolia*

Substrates: rock, boulders, roots

Habitats: in ponds, lakes, streams, rivers, summer dry streams

Fontinalis sullivantii Lindb.

Rarity: S1/2

Substrates: rock, roots, tree bases, logs, sticks, twigs

Habitats: streams, sloughs, swamps, pools

Funariaceae

Aphanorrhegma

Substrates: soil, clay
Habitats: along creeks or trails in places subject to inundation, rarely among other mosses

CoC: 3
Indicator Status: FAC

New Jersey plants are very small, scattered or gregarious. The stems are erect, simple to branched, and standing up to 5 mm tall. The leaves are crispate to contorted when dry and erect-spreading when moist. The leaves are oblong-lanceolate with apices short and tapered to a point and 2-2.5 mm long. Leaf margins are toothed near the apex. The costa is single and extends to the leaf apex. The seta is short, to 0.2 mm, and erect. Capsules are immersed, erect, smooth, symmetric, globose in shape, and opening by an operculum.

Species
Aphanorrhegma serratum (Hook. f. & Wils.) Sull.
Rarity: S1

Aphanorrhegma serratum - Photo by Bob Klips

Funaria

Substrates: soil (sterile, gravel, bare, mineral)
Habitats: disturbed areas (burned over woods, around foundations, roadsides, greenhouses, campfire sites), wood, gravel

CoC: 1
Indicator Status: FAC

New Jersey plants are small to medium-sized, bright green to yellowish green, densely clustered or tufted. The stems are short, erect, and simple. The upper leaves are erect and larger above and reduced below. The concave leaves are oblong-ovate to broadly obovate above with a short (acute) or long (acuminate) tapering point. Leaf margins are erect and entire to toothed beyond the leaf middle. The costa is single and extending to just below the apex to beyond (excurrent). The seta is elongate and can be erect to strongly curved or twisted. The yellow to brown capsules are long exserted, inclined to pendent, pear-shaped (pyriforme), asymmetric and usually curved, and often variously grooved when dry and empty.

Species

Funaria flavicans Michx.
Rarity: S1
Substrates: sterile soil or gravel
Habitats: disturbed areas such as burned over woods, around foundations, and roadsides

Funaria hygrometrica Hedw.
Substrates: bare mineral soil
Habitats: disturbed habitats, greenhouses, campfire sites, and occasionally on wood or gravel

Funaria hygrometrica - Photo by Keith Bowman

Physcomitrium

Substrates: wet soil
Habitats: disturbed places

CoC: 1
Indicator Status: FAC

New Jersey plants are small and may be scattered more densely clustered (gregarious). The stems are simple or forked and erect standing 2-10 mm or sometimes up to 25 mm. The leaves are crisped to contorted when dry and erect to spreading when moist. The leaves are sometimes concave and hooded at the apex (cucullate) ovate-lanceolate, ovate, to obovate, ranging from 1.2-5 mm long with blunt, short tapered (acute) to long tapered (acuminate). Leaf margins are entire to toothed above. The costa is single and extends to just below the leaf tip (subpercurrent) to beyond (short-excurrent). The seta is erect typically standing 0.5 – 13 mm, but may occasionally reach 30 mm. The immersed to exserted capsules are erect and symmetric, but highly variable in shape including ovoid, globose, pear-shaped, or bell-shaped, and often urn-shaped when dry, and opening by an operculum.

Species

Physcomitrium immersum Sull.
Rarity: S1
Substrates: wet soil
Habitats: disturbed places

Physcomitrium pyriforme (Hedw.) Hampe
Substrates: wet soil
Habitats: disturbed places

Physcomitrium pyriforme - Photo by Bob Klips

Grimmiaceae

Bucklandiella

Substrates: rocks (acid), boulders and cliffs, bluffs, soil, gravel, granite rock underhangs, talus slopes
Habitats: dry to wet sites (exposed to shaded), seepage areas, mesic woodlands, along streams and creeks, lake shores, stony slopes

CoC: 7
Indicator Status: FAC

New Jersey plants are green, brown, yellowish, olive green, blackish brown or occasionally jet-black in small to large loose or compact tufts or more extensive mats. The erect to horizontal or creeping stems are variously branched (dichotomous, subpinnate, irregular) to unbranched. The leaves are lanceolate, oblong- or ovate-lanceolate and concave below, channeled or keeled above above. The leaf tips are various shape (acute or occasionally narrowly obtuse), toothing (entire or very seldom crenulate), length (long-piliferous to short-hyaline-tipped or sometimes epilose), and color (hyaline to yellowish hyaline). Leaf margins are variously recurved to revolute on one or both sides and entire. The costa is single extending to the leaf apex (percurrent). Leaf can be smooth or roughened (pseudopapillose). The seta is 1-3 per perichaetium and erect, smooth and twisted clockwise near the tip. Capsules are brown or blackish brown and exserted, straight, symmetric, ovoid, ellipsoid, obloid to narrowly cylindric in shape, narrowed at the mouth, with or without an indistinct neck.

Species

Bucklandiella microcarpa (Hedwig) Bednarek-Ochyra&Ochyra
=*Racomitrium canadense*
Substrates: acidic rocks, boulders and cliffs, soil or gravel, stony slopes and granite rock underhangs, talus slopes
Habitats: exposed, dry or moist sites

Bucklandiella microcarpa – Photo by © Michael Lüth

Bucklandiella venusta (Frisvoll) Bednarek-Ochyra&Ochyra
=*Racomitrium venustum*
Substrates: acidic rocks, boulders, cliff faces and bluffs
Habitats: dry and exposed to shaded and wet sites, seepage areas, mesic woodlands, along streams and creeks, lake shores

Codriophorus

Substrates: rock (shaded, acidic, calciferous, wet to periodically dry), boulders, cliffs, slabs and blocks
Habitats: in stream beds (seasonal), close to brooks and rivers (washed by wave action), lake shores, rapids of streams (often submerged) and waterfalls, damp and wet cliffs

CoC: 8
Indicator Status: FAC

New Jersey plants are small to large, mostly stiff and rigid, but may rarely be pliant, robust to slender, in green, yellow, olive, gray-green, brown to blackish mats. The stems are creeping to ascending and variously branched, sometimes with short, tuft-like horizontal branchlets. Leaves are variously shaped including lanceolate, ovate-or oblong-lanceolate, broadly ovate to broadly lingulate, and elliptical to oblong-elliptical. The leaves are deeply concave to channeled-concave with slender long-acuminate to rounded, rounded-obtuse to sub-acute, muticous or seldom with short to long awns at the apex. Leaf margins are mostly recurved on one or both sides and entire or variously toothed (errose-dentate to papillose-crenulate or crenate at apex). The costa is single and reaches to the leaf middle to the leaf tip and is entire or spurred and forked at the tip. The leaf cells are mostly roughened with large, flat papillae. The seta is twisted, erect, straight, and smooth. Capsules are brown, red-brown, or yellow-brown, straight, symmetric or nearly so, and ovoid to long-cylindric in shape.

Species

Codriophorus acicularis (Hedwig) P. Beauvois
=Racomitrium aciculare
Rarity : S1
Substrates: shaded acidic or rarely calciferous rocks (moist or wet, periodically dry), boulders, cliffs, slabs and blocks
Habitats: in stream beds, close to brooks and rivers (washed by wave action), in seasonal creeks, lake shores, rapids of streams (often submerged) and waterfalls

Codriophorus aciculare – Photo by © Michael Lüth

Codriophorus aduncoides (Bednarek-Ochya) Bednarek-Ochya & Ochya
=Racomitrium aduncoides
Substrates: wet acidic rocks and boulders
Habitats: in or close to streams, damp and wet cliffs, swiftly flowing brooks (often submerged) or on rocks in waterfalls and cascades

Grimmia

Substrates: rock (exposed to tree shaded, dry to wet, acidic or basic, limestone, sandstone, granite), granite and basalt cracks and exposed faces, open plains to montane streams or splash zones of lake shores

Habitats:CoC: 7 (?)
Indicator Status: FAC

New Jersey plants regularly stand 5 to 40 mm, although they may reach 70 mm in olive green, dark black-green to rusty-red-brown dense cushions to loose mats. Leaves are broadly oblong-ovate, oblong-lanceolate, to narrowly ovate-lanceolate, and rarely ligulate and may be concave or keeled toward the apex, which may be a small sharp tip (muticous) to a long-awn (rarely longer than the main leaf blade). Leaf margins are plane, incurved or recurved. The seta is short to long, straight, curved, or wavy. Capsules are immersed to long-exserted, erect, rarely pendent, symmetric or rarely bulging on one side toward the base, and ovoid to oblong, rarely globose or cylindric in shape.

Species

Grimmia elatior Bruch ex Balsamo-Crivelli & De Notaris

Substrates: exposed, dry acidic rock, basic limestone (occasionally)

Grimmia elatior – Photo by © Michael Lüth

Grimmia laevigata (Bridel) Bridel

=Funaria laevigata

Rarity: S1

Substrates: humid to dry, exposed, acidic, sandstone and granite and basalt

Habitats: open plains to montane

Grimmia laevigata – Photo by © Michael Lüth

Grimmia olneyi Sullivant

=Funaria olneyi

Rarity: S1/2

Substrates: cracks and exposed faces of dry to periodically wet, acidic or calcareous rocks

Habitats: streams or splash zones of lake shores

Grimmia pilifera P. Beauvois

=Funaria pilifera

Substrates: (exposed to tree shaded) dry limestone, sandstone and granite

Schistidium

Substrates: rock (wet or dry), concrete (rarely), mineral soil
Habitats: somewhat shaded to open habitats along water courses and lakes, sometimes along seasonally irrigated ledges or cliffs

CoC: 6(?)
Indicator Status: FAC

New Jersey plants form olive green, green, brown, or black dense cushions or loose mats that often have yellow, orange, or red pigments and are typically 10 to 40 mm, but may be shorter or may reach 180 mm tall. The leaves are keeled or concave below and sharply keeled or nearly flat above and variable in shape including ovate-lanceolate, ovate-triangular, lanceolate to linear-lanceolate or elliptical to strap-shaped (ligulate). Leaf tips are short pointed to long-awned and sometimes ending in a fleshy, multistratose apiculus. Leaf margins are recurved, plane or incurved. Leaf cells may be smooth or roughened by papillae. The seta is short and straight. Capsules are immersed, erect, symmetric, and cylindric or bell-shaped (campanulate).

Species

*Schistidium agassizii S*ull. & Lesq.
=Grimmia alpicola
=Grimmia agassizii
Rarity: S1
Substrates: wet or dry rocks
Habitats: along water courses and lakes

Schistidium apocarpum (Hedw.) Bruch. & Schimp.
=Grimmia apocarpa
Substrates: rocks
Habitats: somewhat shaded habitats

Schistidium apocarpum - Photo by Bob Klips

Schistidium liliputanum (Muller Hal.) Deguchi
=Grimmia liliputianum
Substrates: rock
Habitats: open to shaded habitats

Schistidium rivulare (Brid.) Podp.

Rarity: S1

Substrates: wet to dry rocks, concrete (rarely), mineral soil

Habitats: along water courses and lakes, sometimes along seasonally irrigated ledges or cliffs

Schistidium rivulare - Photo by Bob Klips

Schistidium viride H. Blom & C. Darigo

Hedwigiaceae

Hedwigia

Substrates: dry rock, acidic rock (granite, sedimentary), conglomerates, limestone, soil, cliffs, dry, sunny boulders, tree trunks and branches, asphalt shingles, edges of asphalt roads
Habitats: woods

CoC: 3
Indicator Status: FACU

New Jersey plants are large and sordid yellow-green, bright green (rarely), pale buff to red-brown with age, and sometimes hoary at the tips. The leaves are 1.5-3 mm long, erect to bent toward one side (subsecund) and overlapping (imbricate), and can occasionally be somewhat ridged (striolate) when dry. Leaf apices are short to long tapered to a point, or subpiliferous; concolorous or hyaline-white; channeled to tubular; and papillose below, toothed in the middle, and smooth above. Leaf apices are erect to lightly spreading when dry and wide-spreading and recurved or reflexed when moist. Leaf margins are recurved or sometimes plane in the lower 50% to 70% and plane, erect, or incurved in the acumen and in larger leaves variously toothed (dentate to spinulose-dentate) above. Leaf cells are smooth to roughened (simple-papillose). The seta is reddish brown, stout, and short, hidden among the perichaetial leaves. Capsules are deeply immersed, brown below and shiny red-brown at the mouth, top-shaped to urn shaped when dry, subglobose, short-ovoid, or obovoid when moist in shape, longitudinally wrinkled to sharply pleated (sulcate) when dry smooth except for neck and a wide mouth.

Species
Hedwigia ciliate (Hedw.) P. Beauv.

Hedwigia ciliate - Photo by Keith Bowman

Helodiaceae

Elodium

Substrates: (calciphile) soil (hydric, wet, sand, on rock ledges , dry - seasonally submerged), tree bases (wet), logs, wet depressions, thin soil on acid rock ledges, base and roots of *Alnus*

Habitats: wet habitats, open or wooded fens, along streams, edges of swamp forests, peat bogs (hummocks), cedar (Thuja) swampy hardwood forests, pond borders, swamps, fens, marshes, seepages, thickets, grassy wet meadows and bottomlands, seasonally wet areas, dry sinkhole ponds, top of hills and mountains in brushy marshes.

CoC: 8
Indicator Status: FACW

New Jersey plants are medium-sized to large and green to yellow-brown. The stems are erect or spreading and regularly more or less 1-pinnate. Paraphyllia (simple or branched, lanceolate-foliose) and pseudoparaphyllia (lanceolate-foliose) present, but not easily distinguished in the field. The stem leaves are erect or erect-spreading, ovate-lanceolate to rounded-cordate in shape, with an abruptly to gradually narrowed broad or slender acumen. Leaf margins are irregularly revolute below or strongly, revolute (broadly or narrowly) to apex, entire and minutely toothed near apex, or toothed throughout. The costa surface is smooth or with 1 or 2 teeth near the insertion. The leaf cells roughed on the lower side of the stem (1-papillose centrally over lumen or more often near distal ends). The branch leaves are similar to the stem leaves. The seta is 2-6 cm long.

Species

Elodium blandowii (Web. & Mohr.) Eckel

=Helodium blandowii

Rarity: S1

Substrates: (calciphile) hydric soil, wet tree bases

Habitats: open or wooded fens, wet habitats, along streams, edges of swamp forests, peat bogs (hummocks) and bogs of *Thuja occidentalis*

Elodium blandowii – Photo by © Michael Lüth

Elodium elodioides (Ren. & Card.) Eckel

=Helodium blandowii var. *helodioides*

Rarity: S1

Substrates: soil, logs, wet depressions, thin soil on acid rock ledges, wet sand

Habitats: swampy hardwood forests, pond borders, bogs, swamps

Elodium paludosum Austin

=Helodium paludosum

Rarity: S1/2

Substrates: dydric soil, logs, base and roots of *Alnus*, wet tree bases, dry soil (seasonally submerged)

Habitats: fens, marshes, swamps (hummocks) seepages, depressions in wet woods and thickets, grassy wet meadows and bottomlands, seasonally wet areas, dry sinkhole ponds, top of hills and mountains in brushy marshes.

Elodium paludosum - Photo by Bob Klips

Hylocomiaceae

Hylocomiastrum

Substrates: soil, humus, old logs, and rock
Habitats: moist forests, especially under spruce and fir

CoC: 8
Indicator Status: FACU

New Jersey plants have creeping stems, 1-3 mm wide across leafy stem, sypodial, remotely and irregularly pinnate to regularly 1- to 2-pinnate, paraphyllia many, base multiseriate, branches 1- or 2-seriate. Stem leaves erect to spreading, heteromallous, often remote, broadly ovate, ovate-deltoid, or ovate, strongly plicate (often obscuring costa), not rugose, 0.8-2.5 mm, margins serrulate to nearly entire basally, spinose-serrate to serrate in distal 2/3, apex acute to acuminate, costa single, double, or rarely triple, sometimes 2-fid, 1/3 -3/4 leaf length, laminal cells smooth. Branch leaves ovate to lanceolate. Capsule inclined to horizontal, ovoid to ovoid-ellipsoid, 1.3 – 2.5 mml. Seta 1-4.5 cm.

Species

Hylocomiastrum umbratum (Hedw.) Fleisch.

Rarity: S1

Hylocomiastrum umbratum - Photo by Keith Bowman

Hylocomium

Substrates: soil, humus, rotten logs, and rock
Habitats: (extensive areas of forest) moist conifer forests

CoC: 8
Indicator Status: FAC

New Jersey plants typically large, standing up to 20 cm tall in loose tufts. The only representative of this genus in New Jersey is easily recognized by an ascending series of flat, frondose tiers that are typically 20-35 mm wide, but may reach 50 mm wide. Although not often needed for identification, the stem leaves are tightly appressed to erect and not crowded, typically with paraphyllia forming a dense layer among the leaves. The stem leaves are 1.6-4 mm long, oblong-ovate to ovate in shape, and may be lightly pleated or sometimes distinctly wrinkled (rugose) in the acumen. The leaf apex may be abruptly tapered to a long point, or occasionally rounded, obtuse, or abruptly tapered to a short point. Leaf margins are toothed to nearly entire below and toothed above. The costa is double and extends from 25% to 50% of the leaf length and may be nearly absent. The leaf cells are roughed by upturned cell end. The branch leaves are ovate to elliptic-lanceolate. The seta when present stands from 0.5 to 2.5 cm tall. Capsules are inclined to pendent, mostly bent horizontal at the distinct neck, ovoid to ellipsoid in shape, and 1.7 – 2.8 mm.

Species

Hylocomium splendens (Hedw.) Schimp.

Rarity: S1/2

Hylocomium splendens - Photo by Keith Bowman

Loeskeobryum

Substrates: soil humus, rotten logs, and rock
Habitats: moist forests, mixed hemlock and cove hardwood forest

CoC: 8
Indicator Status: FACU

New Jersey plants are relatively large standing up to 12 cm tall. The stems are creeping to ascending and curved, and irregularly branched to regularly pinnate or bipinnate. Many paraphyllia are located along the stems. Stem leaves are spreading to squarrose-recurved, and not crowded. The slightly concave stem leaves are about 1-3 mm long, ovate to broadly ovate in shape with a moderately pleated (plicate) base and sometimes wrinkled (rugose) in the acumen. The leaf apex is gradually to abruptly acuminate with a slender acumen that is slightly channeled. Leaf margins are variously toothed and broadly incurved at the base of acumen. The costa is double and weak extending to the leaf middle. Leaf cells are smooth. Branch leaves are concave, ovate to elliptic-lanceolate in shape, 0.8-1.9 mm long, and spreading. Branch leaf apices are long to abruptly tapered to a point and straight. Seta is 1.2-4 cm long. Capsules are 1.6-2.7 mm long, inclined to horizontal, and ellipsoid in shape with a short neck.

Species

Loeskeobryum brevirostre (Brid.) Fleisch.
=Hylocomium brevirostre
Rarity: S1/2

Loeskeobryum brevirostre - Photo by Bob Klips

Pleurozium

CoC: 6
Indicator Status: FAC

Substrates: soil, humus, rock, forest floor (extensive mats)
Habitats: dry to wet forests, bogs, fens, and grass balds

New Jersey plants are potentially quite large up to 16 cm long. The stems are creeping to erect-ascending and irregularly to regularly (bi-) pinnate. The stems are red and distinctly visible through wet leaves. Stem leaves are loosely appressed to spreading, distinctly crowded and overlapping at the stem apices. The stem leaves are moderately concave, ovate to elliptic in shape, wrinkled when dry, not pleated (plicate) or wrinkled (rugose) when moist, and 1.5-2.8 mm long. The leaf apices are rounded to obtuse, often appearing to end in a blunt short point because of broadly incurved margins, and the apices are often recurved. Leaf margins are entire except near the leaf tip. The costa is double extending to less than 25% of the leaf length, but may appear to be lacking (ecostate). The leaf cells are smooth. Branch leaves are concave, elliptic to lanceolate in shape, and 0.8-1.9 mm long. The seta is 1.5-4.3 cm tall. Capsules are inclined to horizontal, ellipsoid in shape, and 1.5-2.5 mm long

Species
Pleurozium schreberi (Willdenow ex Bridel) Mitten

Pleurozium schreberi - Photo by Keith Bowman

Rhytidiadelphus

Substrates: soil, humus, less often on logs and rock
Habitats: forests from dry-mesic oak/hickory to wet *Thuja* swamps, northern coniferous forests

CoC: 7
Indicator Status: FAC

New Jersey plants are coarse up to 20 cm. The stems are creeping to ascending or erect and irregularly to unevenly pinnate with branches to 2.5 cm. The stem leaves are wide-spreading and crowded at the stem apices. The stem leaves are pleated) plicate or roughened (rugose), ovate-triangular in shape, with cordate-clasping base that is broadly rounded to insertion, and 3.2 – 4.9 mm long. The leaf apex is gradually narrowed to a long point , and the acumen is broad and flat or occasionally wrinkled. Leaf margins are lightly toothed (serrulate) to nearly entire below and lightly toothed above. The costa is double and extending 50% to almost 70% of the leaf length. The leaf cells are smooth to coarsely roughened due to upturned cell ends (prorate). Branch leaves are ovate to narrowly lanceolate and 1-8-3.1 mm long. Capsules are horizontal, oblong-cylindric in shape, and 1.8-3.5 mm long.

Species
Rhytidiadelphus triquetrus (Hedw.) Warnst.
Rarity: S1/2

Rhytidiadelphus triquetrus - Photo by Keith Bowman

Hypnaceae

Callicladium

Substrates: logs, stumps, base of trees, soil, rock
Habitats: conifer and hardwood forests

CoC: 4
Indicator Status: FAC

New Jersey plants are medium-size in extensive green, yellow-green, or brownish, glossy flat mats. Stems are 3-8 cm, creeping, somewhat complanate-foliate, and irregularly branched to subpinnate. The few rhizoids are in clusters just below the leaf insertion. The stem and branch leaves are similar, erect or erect-spreading, and ovate-lanceolate in shape with an acuminate apex. The leaves are concave, crowded, upturned-in a single direction (homomallous) particularly near branch ends, and scarcely altered on drying. Leaf margins are plane and entire. The costa is double and short or occasionally ecostate. The leaf cells are smooth. The seta is orange-red, 1.5-3.2 cm long, and flexuose. Capsules are reddish orange-brown, 1.7-3 mm long, suberect or inclined, rectangular, not or weakly curved, and contracted below mouth and may be slightly wrinkled when dry.

Species
Callicladium haldanianum (Grev.) Crum.

Ctenidium

Substrates: soil, thin soil over rock, humus, tree roots, decayed logs, stumps
Habitats: moist areas

CoC: 5
Indicator Status: FAC

New Jersey plants are small to medium-sized, or sometimes large in dull, light green mats. The stems are about 3 cm long and are usually creeping, and pinnately or subpinnately branched. The leaves at the stem apices are usually sickle-shaped and turned in on direction, and evenly divergent from the stem. Stem and branch leaves are differentiated. The stem leaves are ovate-lanceolate to triangular-acuminate in shape with the basal corners extending beyond the leaf insertion (decurrent), more or less 1 mm (0.8-1.3 mm) long, weakly pleated (plicate), spreading, and sickle-shaped (falcate). The branch leaves are smaller, but more elongate lanceolate than the stem leaves with margins rarely recurved near the base. The stem leaf margins are usually recurved below and plane above and variously toothed. The leaf apex is narrowed to an acumen from near the base or the middle of the leaf. The costa is usually double and short extending to about 25% of the leaf length. The leaf cells are roughened on the lower side of the leaf by upturned cell ends at least near the leaf tip. The seta is reddish, smooth, or occasionally roughened near the capsule. Capsules are nodding to horizontal, short-elliptic to cylindric and curved in shape, and not or somewhat constricted below the mouth.

Species

Ctenidium suberectifolium (Bridel) Buck & B. Allen
=*Ctenidium malacodes* (Hedwig) Mitten
Rarity: S1/2

Ctenidium suberectifolium - Photo by Keith Bowman

Herzogiella

Substrates: soil (shaded), humus, cliffs (acidic), rock, rotten logs, stumps, base of trees, exposed tree roots
Habitats: coniferous woods, swamps

CoC: 5
Indicator Status: FAC

New Jersey plants are medium-sized in light to yellowish or dark green, variously glossy thin to dense mats. Stems are 2 to 3 cm long and creeping to ascending or erect. The stems may be simple or sparingly and irregularly branched. The stem and branch leaves are similar and spreading. Leaf margins are plane, and variously toothed. Leaf apices are acuminate to long-acuminate. The costa is double and short or rarely absent. The leaf cells are smooth. The seta is light brown to red or yellowish. Capsules are erect to inclined, oblong or cylindric in shape, straight to curved, and often contracted below mouth when dry.

Species

Herzogiella striatella (Brid.) Iwats.

Substrates: shaded soil and humus, acidic cliffs and rock, rotten logs, stumps, base of trees, exposed tree roots

Herzogiella striatella – Photo by © Michael Lüth

Herzogiella turfacea (Lindb.) Iwats.

Rarity: S1/2
Substrates: humus, base of trees, rotten logs, stumps, rock
Habitats: coniferous woods, swamps

Homomallium

Substrates: boulders (limestone or sandstone), base of deciduous trees, exposed roots
Habitats: moist areas, streams, shaded ravines

CoC: 5
Indicator Status: FAC

New Jersey plants are medium-sized in dark green or yellowish brown and glossy or shiny dense, flat mats. The stems are 2-3 cm long, creeping, and irregularly straight branched. The stem and branch leaves are similar, erect-spreading or turned in one direction (homomallous), oblong-ovate in shape, and 0.5-1 mm long. Leaf apices are abruptly short-acuminate or awl-shaped (subulate). Leaf margins are erect and entire. The costa is double and short or absent (ecostate). The leaf cells are smooth. The seta is yellow-orange, red or purple, and 0.5-1.5 cm tall. Capsules are yellow to reddish brown, inclined to horizontal, oblong-cylindric in shape, 0.9-1.5 mm long, asymmetric, curved (arcuate), and contracted below the mouth.

Species

Homomallium adnatum (Hedw.) Broth.

Rarity: S1

Homomallium adnatum - Photo by Bob Klips

Hypnum

Substrates: epiphytic, rock, soil (moist, wet), humus, boulders, rotten wood (decaying logs), tree bases
Habitats: terrestrial, calcareous sites, forested areas, open sites, sandy lake and river margins, peatlands, swamp forests , fens

CoC: 5
Indicator Status: FAC

New Jersey plants are small to large in yellowish, green, or brown, glossy or dull tufts. Stems are creeping to erect and 1- or 2-pinnate or sometimes irregularly branched. Stem and branch leaves are similar, turned in one direction (secund), broadly to narrowly ovate in shape, and may be strongly pleated (plicate) or not at all. The leaf apex is gradually short to long tapered point. Leaf margins are sometimes recurved near the base, usually plane above, and wavy (sinuate) to entire below, toothed to entire above. The costa is double or obscured and usually extends 25% of the leaf length. The leaf cells are smooth. The seta is yellowish to reddish. Capsules are erect, inclined, or horizontal; long-cylindric to ovoid in shape; usually curved; and commonly contracted below mouth.

Species

Hypnum cupressiforme Hedw.
Substrates: epiphytic, rock
Habitats: terrestrial

Hypnum cupressiforme – Photo by © Michael Lüth

Hypnum cupressiforme var. *resupinatum* (Tayl.) Schimp.
Rarity: S1

Hypnum curvifolium Hedw.
Rarity: S1/2
Substrates: decaying logs, rock
Habitats: terrestrial, woodlands, peatlands


Hypnum curvifolium - Photo by Bob Klips

Hypnum imponens Hedw.
Substrates: decaying logs, rock, soil


Hypnum imponens - Photo by Keith Bowman

Hypnum lindbergii Mitt.
Substrates:, wet soil, humus, logs
Habitats: terrestrial, open sites, sandy lake and river margins, swamp forests


Hypnum lindbergii - Photo by Bob Klips

Hypnum pallescens (Hedw.) P. Beauv.

Rarity: S1/2

Substrates: rock, boulders, rotten wood, epiphytic on trees, especially tree bases

Habitats: forested areas

Hypnum pallescens – Photo by © Michael Lüth

Hypnum pratense Koch ex Spruce

Substrates: moist soil in fens

Habitats: terrestrial, fens, calcareous sites

Isopterygiopsis

Substrates: soil (calcareous), soil on overturned tree roots, base of trees, decaying wood
Habitats: cliffs (acidic), rock outcrops, boulders in woods, cliff crevices (acidic), rocky banks

CoC: 6
Indicator Status: FAC

New Jersey plants are small in light green to yellowish, glossy thin to dense mats. Stems are creeping, simple or sparingly and irregularly branched. Stem and branch leaves are similar, erect-spreading, occasionally turned in one direction (secund), and lanceolate or ovate- to oblong-lanceolate in shape. The leaf apex is abruptly to long acuminate. Leaf margins are plane to erect and entire or minutely toothed (serrulate). The costa is double and short or absent (ecostate). Leaf cells are smooth or minutely roughened by upturned cell ends (prorulose) on the lower side of the leaf. The seta is red to brown. Capsules are erect to nodding, oblong to ovoid in shape, straight to slightly curved (subarcuate), and contracted below mouth and wrinkled at neck when dry.

Species

Isopterygiopsis muelleriana (Schimp.) Iwats
Rarity: S1
Habitats: acidic cliffs, rock outcrops, boulders in woods

Isopterygiopsis pulchella (Hedw.) Iwats.
Rarity: S1
Substrates: calcareous soil, soil on overturned tree roots, base of trees, decaying wood
Habitats: acidic cliff crevices, rocky banks

Isopterygium

Substrates: base of trees, rotten logs, stumps, sandy soil, sedimentary rock
Habitats: dry wooded regions, swamps, wet roadside ditches

CoC: 6
Indicator Status: FAC

New Jersey plants are small in thin to dense whitish to yellowish mats. The stems are typically up to 2 cm long, but occasionally can reach 5 cm long. The stems are creeping and simple or sparingly and irregularly branched. The stem and branch leaves are similar, erect-spreading to ninety degrees from stem (squarrose), ovate or lanceolate in shape with a long gradually tapered apex. The leaves are not or only slightly wrinkled when dry and 0.7-1.8 mm long. Leaf margins are plane to erect and toothed to entire below and toothed above or rarely entire throughout. The costa is double and short or sometimes lacking (ecostate). Leaf cells are smooth. The seta is yellow to reddish brown and 0.5-1.5 cm tall. Capsules are nodding (cernuous) or rarely erect, light brown to orange-brown in color, ovoid to ellipsoid in shape, 0.5 to 2 mm long, straight or curved (arcuate) when mature, and usually contracted below mouth and sometimes wrinkled at the neck when dry.

Species

Isopterygium tenerum (Sw.) Mitt.

Platygyrium

Substrates: logs, stumps, tree trunks and bases, old wood structures, shaded rock, soil
Habitats: shady, moist forests

CoC: 3
Indicator Status: FACU

New Jersey plants are small to moderately large in thin, intricate green to bronze or darker, often blackish glossy mats. Stems are creeping with short or sometimes elongate branches that are ascending and often loosely foliate or sometimes julaceous. The branches are curved at apices or sometimes straight and subpinnate. Stem and branch leaves are similar, ascending and overlapping (imbricate), ovate-acuminate, may be pleated (plicate), and 0.8-1.1 mm long. Many conspicuous brood branchlets on branch apices are usually present. Leaf margins are somewhat to strongly recurved and entire to rarely slightly toothed near the tip. The costa short and double or often indistinct. The leaf cells are smooth. The seta is reddish. Capsules are erect, cylindric to subcylindric in shape, and may be either symmetric or asymmetric.

Species

Platygyrium repens (Brid.) Schimp.

Platygyrium repens - Photo by Bob Klips

Pseudotaxiphyllum

Substrates: rock (acidic), soil, humus (bank), base of trees, rotten logs, sandstone bluffs, cliff ledges (containing mica)
Habitats: woods

CoC: 6
Indicator Status: FAC

New Jersey plants are medium-sized in thin to dense dark or light green to yellowish, glossy mats. Stems are creeping and simple or sparingly and irregularly branched. Stem and branch leaves are similar and erect-spreading to forming 90 degrees with the stem (squarrose). Leaves are lanceolate, ovate-lanceolate, or oblong-lanceolate with a short to long tapered apex and may be smooth or wavy (undulate). Leaf margins are plane or narrowly recurved at the base and toothed to entire. The costa is double and short or absent (ecostate). The leaf cells are smooth or upper cells are sometimes roughened by upturned cells (prorulose) on the lower side of the leaf. The seta is yellow, red, reddish brown, or dark red. Capsules are erect to pendulous, ellipsoid to ovoid in shape, straight to slightly curved (subarcuate), and contracted below mouth and wrinkled at the neck when dry.

Species

Pseudotaxiphyllum distichaceum (Mitt.) Iwats.
Rarity: S1
Substrates: soil, humus banks, sandstone bluffs, cliff ledges containing mica

Pseudotaxiphyllum elegans (Brid.) Iwats.
Substrates: acidic rock and soil, humus, base of trees, rotten logs
Habitats: woods

Pseudotaxiphyllum elegans – Photo by © Michael Lüth

Ptilium

Habitats: Coniferous forest floors, peatlands, deciduous forests

CoC: 8
Indicator Status: FAC

New Jersey plants are large in loose dark green (deeply shaded sites) or orange-golden to rusty (exposed sites), shiny mats. Stems are suberect to ascending, 3-10 cm long, usually hooked at apices, and regularly pinnate, branches arising at right angles and 0.3-1.5 cm long, and usually hooked at apices. The leaves tapering to apex and 2-3 mm long. Stem and branch leaves are differentiated. Stem leaves form 90 degree angles with the stem (squarrose), broadly ovate, and strongly pleated (plicate). Leaf margins are plane and sharply toothed (serrulate) near the acuminate apex. The costa is absent (ecostate) or short and double. Leaf cells are smooth. Branch leaves are usually curved into a near circle and facing the same direction, pointing toward base of the main shoot and not the underside, oblong-lanceolate, 1-2 mm long, pleated (plicate), and tapering to apex. The seta is red-brown and 2-3 cm tall. Capsules are red-brown, horizontal, cylindric in shape, 1.5-2 mm long, curved (arcuate), and contracted below mouth.

Species

Ptilium crista-castrensis (Hedw.) De Not.

Rarity: S1

Ptilium crista-castrensis - Photos by Keith Bowman

Pylaisia

Substrates: tree trunks (broad-leafed) **CoC:** 5
Habitats: **Indicator Status:** FAC

New Jersey plants are small in low yellowish to whitish, shiny mats. Stems are creeping and regularly or irregularly pinnate and branches when dry are usually strongly. Stem and branch leaves are similar. Stem leaves are appressed when dry, erect-spreading when moist, ovate-lanceolate in shape, and not or slightly pleated (plicate). Leaf margins are plane or sometimes slightly involute near the tip and subentire to toothed near the acuminate apex. The costa is short and double or indistinct. The leaf cells are smooth. Branch leaves are narrowly ovate- to oblong-lanceolate, and may be smaller or occasionally somewhat larger than the stem leaves. The seta is yellowish or reddish. Capsules are erect to suberect, oblong-cylindric to oblong-ovoid in shape, straight, and not contracted below mouth.

Species

Pylaisia intricata (Hedwig) Schimper in P. Bruch and W. P. Schimper
=*Pylaisiella intricata*
Rarity: S1/2
Substrates: trunks of broad-leaved trees

Pylaisia polyantha (Hedwig) Schimper in P. Bruch and W. P. Schimper
=*Pylaisiella polyantha*
Rarity: S1
Substrates: tree trunks

Pylaisia polyantha – Photo by © Michael Lüth

Pylaisia selwynii Kindberg
=*Pylaisiella selwynii*
Rarity : S1
Substrates: tree trunks

Taxiphyllum

Substrates: soil (shaded, siliceous, calcareous), rock (shaded, siliceous, calcareous), base of trees, exposed tree roots, rotten logs
Habitats: cedar swamps

CoC: 6
Indicator Status: FAC

New Jersey plants are medium-sized to large in thin to dense light to dark green or yellowish, glossy mats. Stems are creeping, flattened (complanate-foliate) or rounded (julaceous or subjulaceous), and simple or sparingly and irregularly branched. Stem and branch leaves are similar, erect to wide-spreading to forming 90 degree angle with the stem (squarrose). Leaves are ovate, ovate-lanceolate, oblong-lanceolate, or oblong-ovate in shape and not or occasionally pleated (plicate) with a short to long pointed or subobtuse apex. Leaf margins are plane or recurved and toothed to entire at the base and toothed above. The costa is short and double or sometimes absent (ecostate). Leaf cells are smooth or roughened by upturned cell ends (prorulose) on the lower side of the leaves. The seta is yellowish to red. Capsules are nodding (cernuous), oblong-ovoid in shape, straight to curved (arcuate), and somewhat contracted below mouth and wrinkled at neck when dry.

Species

Taxiphyllum deplanatum (Bruch & Schimp.) Fleisch.

Rarity: S1/2
Substrates: shaded siliceous or calcareous soil and rock, base of trees, exposed tree roots, rotten logs
Habitats: cedar swamps

Taxiphyllum deplanatum - Photo by Bob Klips

Taxiphyllum taxirameum (Mitt.) Fleisch.

Rarity: S1

Substrates: shaded siliceous or calcareous soil and rock

Taxiphyllum taxirameum - Photo by Bob Klips

Leptodontaceae

Forsstroemia

Substrates: (epiphytic) boles of hardwood trees, rock, bark of evergreen trees
Habitats: shaded, relatively humid areas, along streams

CoC: 5
Indicator Status: FAC

New Jersey plants have secondary stems are irregularly pinnate and arise from their substrate. Stem and branch leaves are lanceolate, ovate-lanceolate, broadly ovate-lanceolate, oval, or deltoid in shape, and 1-3 mm long with an acute to short-acuminate apex. Stem leaves are loosely appressed to overlapping (imbricate) when dry and erect-spreading to forming 90 degree angles with the stem (squarrose) when moist. Leaf margins are recurved to mid leaf or beyond and entire or toothed above. The costa is single or double and ending below the apex. Branch leaves are similar to the stem leaves, but smaller. The costa is weak and single extending 25% to 75% of the leaf length or double and short. The seta is 0.4 -3.9 mm long. Capsules are immersed to exerted and 1-2.3 mm long.

Species

Forsstroemia trichomitria (Hedw.) Lindb.
Rarity: S1

Forsstroemia trichomitria - Photo by Keith Bowman

Leskeaceae

Haplocladium

Substrates: wood (damp), rock, humus, soil
Habitats: mesic habitats, woodlands

CoC: 5
Indicator Status: FACU

New Jersey plants are small to medium-sized in dense olive green, yellow-green, or brownish mats. Stems are pinnate to subpinnate with few or many paraphyllia. Rhizoids often arise from the axils of older leaves. Stem and branch leaves are dimorphic. Stem leaves are erect, curved, or slightly curved in one direction (subsecund) when dry and erect-spreading when moist. Stem leaves are ovate to sometimes triangular and pleated (plicate) or not with abruptly short- or long-acuminate apex. Leaf margins are plane to somewhat recurved below and weakly toothed. The costa is single and ending below the apex oar at the apex and is weakly flexuose above. Leaf cells are smooth to the leaf middle and roughened (1-papillose or prorulose) near the leaf apex. Branch leaves are smaller than stem leaves, with a margin that are more strongly serrate and the leaf cells are more strongly roughened (papillose). The seta is 1.5-3 cm long. Capsules are erect, inclined or horizontal, oblong, and curved.

Species

Haplocladium microphyllum Hedw.
=Bryohaplocladium microphyllum
Rarity: S1
Substrates: damp wood, rock, humus, soil
Habitats: woodlands

Haplocladium virginianum (Bridel) Brotherus in H. G. A. Engler and K. Prantl
=Bryohaplocladium virginianum
Substrates: soil, wood, rock
Habitats: mesic habitats

Haplocladium virginianum - Photo by Bob Klips

Leskea

Substrates: base and lower trunks of trees (hardwood and coniferous, bald cypress, pine, red cedar), logs, rock, soil around tree bases, shingle roofs
Habitats: flood plains, low areas near streams and creeks, roofs

CoC: 4
Indicator Status: FAC

New Jersey plants are small in pale green, dark green, or brownish mats. Stems are freely branched to subpinnate with a few paraphyllia, and sparsely radiculose. Stem and branch leaves are similar or differentiated. Stem leaves are erect or somewhat recurved when dry and erect-spreading when moist, oblong-ovate or ovate-lanceolate in shape, and pleated on one side, double pleated, or plane. Leaf apex may be short pointed, long pointed, or obtuse. Leaf margins are plane or more or less recurved below and entire to lightly toothed near the apex. The costa is single ending before the apex and often flexuose-curved near the leaf apex. Leaf cells are more or less roughened (papillose) on the lower side or both surfaces. The seta is 0.4-1.2 cm long. Capsules are erect, cylindric to oblong-cylindric in shape, and symmetric to distinctly curved.

Species

Leskea obscura Hedw.
Substrates: base and lower trunks of hardwood trees, bald cypress, pine, logs, rock
Habitats: flood plains

Leskea polycarpa Hedw.
Substrates: base and lower trunks of hardwood and coniferous trees, soil around tree bases, logs, rock
Habitats: low areas near streams and creeks, roofs

Leskea polycarpa – Photo by © Michael Lüth

Leskea gracilescens Hedw.

Substrates: base of trunks of hardwood trees, red cedar, soil around tree bases, logs, shingle roofs, rock

Leskea gracilescens - Photo by Bob Klips

Leskeella

Substrates: tree bark, calcareous rock
Habitats:

CoC: 5
Indicator Status: FACU

New Jersey plants are small in thin dark green to blackish mats or patches. Stems are appressed to their substrate and irregularly branched. Rhizoids are clustered and arising from base of leaves. Stem and branch leaves slightly differentiated. Stem leaves are appressed to erect when dry and erect-spreading when moist. Stem leaves are symmetric, 0.6-1.2 mm long, lanceolate in shape, and not to weakly pleated (plicate) on either side of costa. The leaf apex is slender abruptly to gradually acuminate or awl-shaped (subulate) and longer than main portion of the leaf. Leaf margins are recurved below and entire to weakly toothed above. The costa is single and end at or below the apex and typically fills the acumen. Leaf cells are smooth. Branch leaves are ovate to ovate-lanceolate, 0.4-0.8 mm long with a short pointed apex to awl-shaped. The seta is 1-1.2 cm long. Capsule are erect to inclined, subcylindric in shape, and symmetric.

Species

Leskeella nervosa (Brid.) Loeske

Rarity: S1

Leskeella nervosa - Photo by © Michael Lüth

Lindbergia

Substrates: tree trunks, roadside maples and elms, deciduous trees, cedar, pine, logs, rock

CoC: 4
Indicator Status: UPL

New Jersey plants are small in loose dark green to yellowish or brownish, dull mats. Stems are more or less straight when dry and irregularly branched. Rhizoids are found occasionally on the stem. Stem and branch leaves are similar. Stem leaves are crowded and overlapping (imbricate) when dry and wide-spreading to forming a 90 degree angle with the stem (squarrose) when moist. Leaves are ovate or ovate-lanceolate with a pale or yellowish short tapered point (acute to short-acuminate), although a hair-point may sometimes be present. Leaf margins are plane and entire or lightly toothed near the apex. The costa is single extending 50%- almost 70% of the leaf length, and straight to weakly flexuose. The leaf cells of the leaf middle are roughened with a single papillae and apical cells are smooth. The seta is 0.6-0.8 cm tall. Capsules are 1.5 mm, erect, oblong-cylindric in shape, and symmetric or weakly curved.

Species

Lindbergia brachyptera (Mitt.) Kindb.

Rarity: S1

Lindbergia brachyptera - Photo by Bob Klips

Leucobryaceae

Campylopus

Substrates: typically buried in white sand in depressions
Habitats: open pine and pine-oak forests and open grasslands, coastal lowlands

CoC: 9
Indicator Status: FACU

New Jersey plants are usually less than 1 cm, they may be large in loose dark green to brownish green or blackish mats. The leaves are erect and narrowly spreading (erect-patent). The stems may be sparsely felted with red or whitish rhizomes (tomentose). The leaves are 2.5-4 mm long, small, lanceolate, and ending in a straight tip. Leaf margins are entire. The costa fills about 33% of the leaf width and extends beyond the leaf apex (excurrent) in a straight, toothed, and hyaline point that is ridged on the lower side with prominent cells. The sporophytes are not known in the area.

Species
Campylopus carolinae Grout

Leucobryum

Substrates: humus (moist), soil (sandy), rotting logs and stumps, tree bases (hardwood and pine), rock ledges
Habitats: forests, bogs, and swamps

CoC: 3
Indicator Status: FAC

New Jersey plants are small to large in white to pale green, glaucous, grayish or pale brown compact to loose cushions or turfs. Stems are erect, 0.5-15 cm tall and branching. The leaves are crowded and spreading from an oblong-obovate to elliptic sheath, lanceolate or subulate-lanceolate in shape, and concave to nearly tubular. The leaves can be erect, spreading, reflexed to flexuose or curved in one direction (falcate-secund) and they are changed very little when dry. The costa is very thick and fills much of the leaf. The color of the leaf is due to several layers of clear cells above and below a single layer of green cells. The seta is 1-2 cm tall. Capsules are inclined, asymmetric, pleated (plicate) when dry, and often with a swelling at the base (strumose).

Species

Leucobryum albidum (Brid.) Lindb.
Substrates: moist humus, sandy soil, rotting logs and stumps, tree bases (hardwood and pine)
Habitats: forests, bogs, and swamps

Leucobryum glaucum (Hedw.) Angstr.
Substrates: humus, soil, rotting logs and stumps, tree bases and rock ledges
Habitats: forests, bogs, and swamps

Leucobryum glaucum - Photo by Keith Bowman

Leucodontaceae

Leucodon

Substrates: tree trunks, logs, stumps, rock, soil
Habitats: upland and montane forests

CoC: 7
Indicator Status: FACU

New Jersey plants are medium-sized to large in green to brownish, glossy or dull rigid tufts. The stems are irregularly branched, but are usually simple. The stem leaves are ovate to ovate-lanceolate in shape with an apex that is either abruptly or gradually tapered to a slender acumen. Leaf margins are plane to reflexed or revolute and entire. The leaves are ecostate. Leaf cells are smooth or rarely slightly roughened (papillose). Branch leaves are overlapping (imbricate), erect-appressed when dry and ascending to spreading when moist. The leaves are ovate-lanceolate with a short to long tapered point (acute to acuminate), somewhat concave, and larger than the stem leaves. The leaf margins are plane to reflexed and entire or toothed near the apex. The seta is short to elongate. Capsules are immersed to exserted and ovoid to pyriforme in shape.

Species

Leucodon brachypus Brid.
Rarity : S1
Substrates: tree bark, logs, stumps, rock
Habitats: upland and montane forests

Leucodon julaceus (Hedw.) Sull.
Substrates: tree trunks, logs, rock, soil

Leucodon julaceus - Photo by Bob Klips

Meesiaceae

Leptobryum

Substrates: soil, wood, rock
Habitats: disturbed habitats, greenhouses

CoC: 3
Indicator Status: FAC

New Jersey plants are typically 0.5 – 1.5 cm, but may reach 6 cm tall. The stem leaves are flexuose, erect, or wide-spreading, and long-lanceolate to linear in shape with an elliptically to 4-5 mm, with a narrowly acuminate apex. The leaves are flexuose when dry and erect to wide-spreading when moist. Leaf margins are plane and entire or sometimes toothed near the apex. Leaf cells are smooth. The costa is wide and ends in the apex. The seta is 1-4.5 cm tall. Capsules are 1.5-2.5 mm long.

Species

Leptobryum pyriforme (Hedw.) Wils.

Rarity: S1/2

Leptobryum pyriforme – Photo by (c) Michael Lüth

Meesia

Substrates: calcareous soil banks
Habitats: rich fens

CoC: 8
Indicator Status: OBL

New Jersey plants are relatively small standing 0.1-1.3 cm tall. The stem leaves are contorted when dry and wide-spreading and distinctly 3-ranked when moist. The leaves are strap-shaped (ligulate) to ovate-lanceolate and 1.5-4 mm long with a short point (acute). Leaf margins are plane to reflexed below to recurved throughout and lightly toothed. The costa is narrow and ends at or just below the apex. The leaf cells are smooth. The seta is 3-10 cm long. Capsules are 3-4.5 mm long.

Species

Meesia triquetra (Richt.) Angstr.

Rarity: S1

Meesia triquetra – Photo by © Michael Lüth

Mielichhoferiaceae

Pohlia

Substrates: soil (banks, acidic, gravelly, sandy, clay, disturbed), rock crevices, under roots, humus-rich soil banks, tree bases, soil on upturned tree bases, logs
Habitats: path banks, stream banks, rock crevices, disturbed places

CoC: 3
Indicator Status: FAC

New Jersey plants range from very small (0.1 cm) to large (10 cm) and may be found as scattered plants or in deep and sometimes extensive turfs. The leaves are erect to spreading, narrowly lanceolate to ovate-lanceolate, and 0.6-3.5 mm long with an acute (short-acuminate in *P. melanodon*) apex. Leaf margins are plane, although they are strongly revolute in *P. cardotti* and *P. crudoides*, and variously toothed near the apex or rarely entire. The costa ends well below the apex, just below the apex (subpercurrent), at the apex (percurrent), or rarely beyond (short-excurrent). The seta is single, straw colored (stramineous) to orange-brown, and straight or bent. Capsules are inclined, narrowly cylindric to broadly pear-shaped (pyriforme) or urn-shaped (urceolate), typically 1-6 mm long, but may reach 10 mm, and the neck is sometimes the length of the urn or more.

Species

Pohlia cruda (Hedw.) Lindb.

Rarity: S1
Substrates: soil banks, rock crevices, under roots, and paths


Pohlia cruda – Photos by © Michael Lüth

Pohlia annotina (Hedw.) Lindb.

Rarity: S1
Substrates: acid, gravelly or sandy disturbed soil
Habitats: path banks, steam banks

Pohlia annotina – Photo by © Michael Lüth

Pohlia elongata Hedw.

Rarity: S1
Substrates: humus-rich soil banks, tree bases
Habitats: along streams and paths

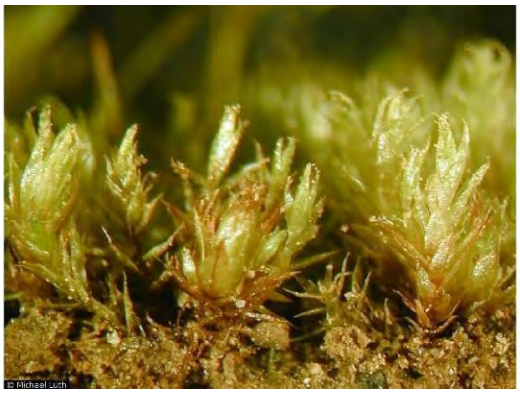
Pohlia elongata – Photo by © Michael Lüth

Pohlia lescuriana (Sull.) Ochi

Rarity: S1
Substrates: disturbed soil, soil on upturned tree bases
Habitats: path banks, rock crevices, along streams

Pohlia melanodon (Bridel) A.J. Shaw

Rarity: S1
Substrates: disturbed clay, sandy soil (rarely)
Habitats: path banks, along streams



Pohlia melanodon – Photo by © Michael Lüth

Pohlia nutans (Hedw.) Lindb.

Substrates: soil banks, logs, tree bases
Habitats: disturbed places


Pohlia nutans - Photo by Bob Klips

Pohlia proligera (Kindberg) Lindberg ex Arnell

Rarity: S1
Substrates: acid, sandy distubed soil
Habitats: path banks, steam banks

Pohlia proligera – Photo by © Michael Lüth

Pohlia wahlenbergii (F. Weber & D. Mohr) A. L. Andrews in A. J. Grout

Substrates: disturbed clay or sandy soil (rarely)

Habitats: path banks, along streams

Pohlia wahlenbergii – Photo by © Michael Lüth

Mniaceae

Mnium

Substrates: soil (moist, sandy, banks over rock), humus, rock (shaded, calcareous), tree bases, logs, stumps
Habitats: banks along streams, shorelines, cliff faces (shaded), forests, moist shaded sites

CoC: 6
Indicator Status: FAC

New Jersey plants are usually medium-sized, but range from small (0.5 cm) to large (8 cm). The plants form open to compact turfs or mats. The stems are red, reddish brown, or brown, or rarely yellowish brown, and erect, simple, or branched above. Rhizoids are brown and typically found at the base of the stem. The green to dark green, or sometimes yellowish leaves are often crisped and contorted, undulate, or spirally twisted when dry and more or less flat and variously erect-spreading, or spreading when moist. The leaves are quite variable in size (1.5-6.5 mm), shape (elliptic, obovate, oblong-ovate, ovate, ovate-elliptic, ovate- or elliptic-lanceolate, or obovate-spatulate) with a variable apex (acute, obtuse, rarely rounded, or acuminate, apiculate or sometimes cuspidate, cusp often toothed). Leaf margins, which can vary in color (green, reddish brown, or brown), are plane and toothed (above or to below the leaf middle) with usually paired and often sharp teeth that are sometimes single, small, and blunt, rarely rounded or indistinct. The costa extends to the leaf apex (percurrent) or beyond (excurrent), but may end well below to just below the apex. The seta is single or rarely double or triple, 1-5 cm tall, straight or wavy (flexuose) and usually yellowish becoming red with age. Capsules are horizontal to pendent; yellow, yellow-brown, or brown; oblong cylindric in shape; and 2-7 mm long.

Species

Mnium hornum Hedw.

Substrates: moist, sandy soil, humus
Habitats: banks along streams, shorelines, cliff faces

Mnium hornum - Photo by Bob Klips

Mnium lycopodioides Schwagrischen
=*Mnium ambiguum*
Rarity: S1
Substrates: shaded, often calcareous rock, tree bases, logs
Habitats: cliffs, banks along streams

Mnium lycopodiodes – Photo by © Michael Lüth

Mnium marginatum (Dickson ex Withering) P. Beauvois
Rarity: S1/2
Substrates: humus, soil, logs, rock, base of trees
Habitats: forests, shaded cliffs

Mnium marginatum – Photo by © Michael Lüth

Mnium spinulosum Bruch & Schimp.

Rarity: S1

Substrates: humus, logs, rock, base of trees

Habitats: forests

Mnium spinulosum – Photo by © Michael Lüth

Mnium stellare Hedw.

Rarity: S1/2

Substrates: base of trees, stumps, soil banks, soil over rock

Habitats: moist shaded sites

Mnium stellare – Michael Lüth

Plagiomnium

Substrates: humus, soil, peat, logs, rock, tree bases, stumps
Habitats: swamps, forests (wet, mesic, hardwood, fire-dependent), cliffs/talus (calcareous), wet meadows/carrs, forested rich peatlands, bogs, fens, shores of rivers and lakes

CoC: 5
Indicator Status: FAC

New Jersey plants (1-)2-5(-10) cm and form dense or open mats. The green or yellow-green stems usually become brownish with age. Fertile stems are erect and may or may not branch above and may be tree-like (dendroid) while sterile stems are horizontal (plagiotripic) or arching, and rarely erect and may grow up to 20 cm long. The green or yellow-green leaves rarely become black with age and are variously crisped or contorted when dry and erect-spreading and usually flat, occasionally irregularly wavy or transversely undulate when moist. The leaves are variable in size (1-14 mm), shape (elliptic, obovate, oblong, oblong-lingulate, oblong-elliptic, or rarely orbicular or diamond-shaped), and apex (acute, acuminate, obtuse, rounded, truncate, retuse, or emarginated, mucronate, apiculate or cuspidate, cusp toothed or not, and rarely bent to one side). Leaf margins, which may be green or yellow-green, are plane and toothed or rarely entire. Marginal teeth are single, sharp or blunt. The costa extends to the leaf apex (percurrent) or beyond (excurrent), but may rarely end below the apex. The margins are differentiated. The setae are single or multiple; yellow, yellow-green, brown, sometimes reddish or greenish, rarely orange, dark red, or blackish with age, 1.2-5 cm tall, and straight to flexuose. Capsules are horizontal to pendent; yellow or yellowish brown; cylindric, oblong, oblong-cylindric, obovoid, or ovoid in shape; 1.5-5 mm long.

Species

Plagiomnium ciliare (C. Mull.) T. Kop.

Substrates: humus, soil, logs, rock, tree bases
Habitats: swamps and mesic hardwood forests, wet and fire-dependent forests/woodlands, cliffs/talus

Plagiomnium ciliare - Photo by Keith Bowman

Plagiomnium cuspidatum (Hedw.) T. Kop.

Substrates: soil, logs, rock, stumps, or tree bases

Habitats: wet meadows/carrs, forested rich peatlands, wet forests, fire-dependent forests/woodlands, mesic hardwood forests, cliff/talus

Plagiomnium cuspidatum - Photo by Keith Bowman

Plagiomnium ellipticum (Brid.) T. Kop.

Substrates: peat or humus

Habitats: bogs, fens, wet meadows and forests, swamps, shores of rivers and lakes, fire-dependent forests/woodlands, cliff/talus

Plagiomnium ellipticum – Photo by © Michael Lüth

Plagiomnium medium (Bruch & Schimp.) T. Kop.

Rarity: S1

Substrates: soil, humus, rock, tree bases

Habitats: wet forests, cliffs/talus, fire-dependent forests, swamps

Plagiomnium medium - Photo by Bob Klips

Plagiomnium rostratum (Schrad.) T. Kop.

Rarity: S1/2

Substrates: rock, soil

Habitats: calcareous cliffs, woods

Plagiomnium rostratum – Photo by Michael Lüth

Pseudobryum

Substrates: moist soil or humus, boulders, tree roots
Habitats: swamps, fens, wet meadows, streams, wet depressions in forests

CoC: 8
Indicator Status: OBL

New Jersey plants are large and often form loose mats, but may often grow with other bryophytes. The stems are erect and typically stand 3-10 cm tall, but may reach 15 cm. Stems are brown and typically unbranched, although they are sometimes branched above. The green or yellow-green leaves may become dark brown with age. The leaves are crisped and weakly contorted when dry and erect or erect-spreading and often weakly undulate when moist. The leaves are typically 4-6 mm long, but may extend beyond this range and are broadly ovate, elliptic, or sometimes orbicular with a blunt or sharp apiculus. Leaf margins are plane and entire or lightly toothed to below leaf middle. Marginal teeth are single and blunt or sometimes rounded. The leaf margins are indistinctly differentiated. The costa extends to just below or well below the apex, but may rarely reach to the leaf apex. The orange-yellow seta is single or rarely double, flexuose and 2-5.5 cm tall. Capsules are yellowish brown, pendent, ovatein shape and 2-2.5 mm long.

Species

Pseudobryum cinclidioides (Hub.) T. Kop.
Rarity: S1

Rhizomnium

Substrates: logs(moist), humus, rock, logs
Habitats: swamps, seeps, along lakeshores and stream banks (forested), forests, cliffs (shaded)

CoC: 6
Indicator Status: FACW

New Jersey plants forms tufts or mats that stand 1-8 cm tall, but may reach 12 cm. The stems are red or reddish brown and may become almost black with age. Stems are usually erect, but may rarely be wavy at maturity or sterile stems sometimes arching and usually unbranched. Rhizoids are brown and mainly restricted to the stem bases. Leaves are variable in color (green, dark green, or occasionally reddish, reddish brown, or yellow-green), somewhat contorted when dry, and erect-spreading and flat, or sometimes undulate when moist. Leaves are obovate, elliptic, or rarely more or less orbicular and typically 1-7 mm long, though occasionally up to 13 mm with an apex that is usually rounded, occasionally notched (retuse), emarginate, or sometimes apiculate. Leaf margins are differentiated in structure and color (green, reddish, or brown, rarely blackish with age). Leaf margins are plane and entire. The costa extends to just below (subpercurrent) to well below apex, or extending to the apex (percurrent), distal abaxial surface smooth, maginal cells differentiated. The seta is single, reddish brown or occasionally orange, often pale, 1-5 cm long, and straight to somewhat flexuose. Capsules are horizontal to pendent; yellow or yellowish brown; elliptic, ovate, subglobose, oblong, or cylindric in shape; and 1-4.5 mm long.

Species

Rhizomnium appalachianum T. Kop.
Rarity: S1
Substrates: logs, moist soil, humus, rock
Habitats: swamps, seeps, along lakeshores and stream banks

Rhizomnium magnifolium (Horik.) T. Kop.
Rarity: S1
Substrates: moist soil, humus, rock
Habitats: forested stream banks, seeps

Rhizomnium magnifolium – Photo by Michael Lü

Rhizomnium punctatum (Hedw.) T. Kop.

Substrates: logs, moist soil, humus, rock

Habitats: forests, stream banks, shaded cliffs

Rhizomnium punctatum - Photo by Keith Bowman

Myriniaceae

Schwetschkeopsis

Substrates: base of hardwoods, acidic and basic rock

CoC: 6

Indicator Status: FACU

New Jersey plants are small to medium-sized and dark olive green. The stems are pinnate and branches may be simple or rarely with large secondary branches that are often flagelliform and usually all pointing in the same direction. Stems are usually conspicuously wider than the branches and the branches can be prostrate or ascending. Stem and branch leaves have similar shapes, but often noticeably differentiated in size. Leaves are ovate-lanceolate and 0.5-0.7 mm long with long or short tapered points. Leaf margins are toothed (serrulate). The costa may be absent (ecostate) or double and short. Leaf cells are swollen (mammillose) or roughened by projecting cell ends on the lower side of the leaf. The seta is orangish red, fading to yellow with age and 0.4-0.8 cm tall. Capsules are 1-1.4 mm long.

Species

Schwetschkeopsis fabronia (Schwaegr.) Broth.

Rarity: S1/2

Neckeraceae

Homalia

Substrates: base of trees, roots, rotten logs, boulders (shaded), banks (shaded), cliffs (limestone), soil
Habitats:

CoC: UA
Indicator Status: FACU

Plants medium-sized, shelf-forming, green to yellowish green, shiny and may be 3-7 cm. Stems are creeping and sparsely to irregularly branched. Pimary stems are somewhat stoloniferous with flagelliform branches or apices present. Primary stem leaves are appressed, oblong-ovate in shape, 0.5-1 mm long. Primary stem leaf margins are entires with an acute apex acute and the costa may be single, double, or occasionally absent. Secondary stem and branch leaves are erect-spreading and oblong-ovate to oblong-obovate in shape, symmetric, and flat and 1-3 mm long. The leaf apex is rounded, obtuse, or obtuse-apiculate. The costa is single extending 50% to 75% of the leaf length or double and very short. Leaf margins are entire below and toothed above. The seta is yellow to yellowish brown and 1-1.5(-2) cm tall. Capsules are erect to suberect, oblong-cylindric or oblong-ovoid in shape with a narrow neck.

Species
Homalia trichomanoides (Hedw.) Schimp.
Rarity: S1

Homalium trichomanoides – Photo by © Michael Lüth

Neckera

Substrates: base and trunks of trees, boulders, rock cliffs
Habitats: conifer and deciduous forests

CoC: 8
Indicator Status: FACU

New Jersey plants are medium-sized to large (5-11 cm) forming light to dark green or sometimes yellowish and usually shiny shelf-like growths on substrates. Stems either Unbranched or with few attenuate branches. Stem leaves are oblong-ovate, wavy (undulate), and typically 2-3 mm long or up to 5 mm with an acute to broadly acute apex. Leaf margins are toothed to entire below and toothed at the apex. The costa is absent (ecostate) or double and short. The seta is only about 0.1 cm long. Capsules are immersed and cylindric, oblong, or globose in shape.

Species

Neckera pennata Hedw.
Rarity: S1

Neckera pennata – Photo by © Michael Lüth

Orthotrichaceae

Amphidium

Substrates: seasonally wet crevices of cliffs (neutral to acidic)
Habitats:

CoC: 6
Indicator Status: FACU

New Jersey plants form dense cushions. The stems are erect and the branches are ascending. The leaves are twisted and contorted when dry and spreading when moist. The leaves are linear to narrowly lanceolate with an acute apex. Leaf margins are entire or toothed. The costa extends to the leaf apex (percurrent) or to somewhat beyond (short-excurrent). The upper cells are roughened (papillose). The marginal cells are not much differentiated. The seta is 1-3.5 mm tall. Capsules are mostly emergent to immersed, oblong in shape, 8-ribbed and constricted below mouth.

Species

Amphidium lapponicum (Hedw.) Schimp.
Rarity: S1
Substrates: seasonal wet crevices of neutral to acidic cliffs

Amphidium lapponicum – Photo by © Michael Lüth

Amphidium mougeotii (Bruch & Schimp.) Schimp.
Rarity: S1
Substrates: seasonally wet crevices of neutral to acidic cliffs

Amphidium mougeotii – Photo by © Michael Lüth

Drummondia

Substrates: trunks and branches of deciduous trees, conifers, logs
Habitats: dry, upland forests, cedar glades

CoC: 7
Indicator Status: FACU

New Jersey plants are medium-sized and form loose olive green, dark green, or yellow-brown mats. Stems are creeping with erect branches. The leaves are erect-appressed and stiff when dry and spreading to wide-spreading when moist. The leaves are broadly lanceolate to oblong-lanceolate in shape with an obtuse, acute, or cuspidate apex that is sometimes incurved. The leaf margins are entire and not differentiated. The costa extends to just below the apex and is broadly channeled. Stem leaves are concave, channeled, and 1.1-1.8 mm long. The seta is twisted and 2-3.5 mm long. Capsules are long-exserted, ovate to ovate-oblong in shape, 0.9-1.3 mm long, wrinkled when old and dry, and not constricted below the mouth, but sharply contracted to the seta.

Species

Drummondia prorepens (Hedw.) E.G. Britt.

Rarity: S1/2

Drummondia prorepens – Photo by Keith Bowman

Orthotrichum

Substrates: trees (trunks, lower branches, base, deciduous, conifers, *Populus*, *Juniperus*, aspen), rock (calcareous), boulders, bluffs (dry, exposed, calcareous, dolomite)
Habitats: river bottoms, forests (hardwood, open, mesic, dry), along streams (shaded edges), crevices of rock, trees along roadsides (*Juniperus*)

CoC: 4
Indicator Status: FAC

New Jersey plants typically form small tufts or loose cushions, although they can occasionally be relatively large. The stems are erect with erect to ascending branches. The leaves are usually erect-appressed and straight when dry and spreading to wide-spreading when moist. The leaves are ovate, oblong, lanceolate, strap-shaped (ligulate), or linear-lanceolate in shape with an acute, acuminate, apiculate, or obtuse apex. Leaf margins are entire or toothed near the apex. The costa usually ends the near apex. Leaf cells are roughened by papillae (1-4 per cell). The seta is up to 6 mm tall. Capsules are immersed, emergent, or exserted, globose to cylindric in shape, smooth or ribbed (8 or 16), and sometimes constricted below the mouth when dry.

Species

Orthotrichum anomalum Hedw.
Rarity: S1
Substrates: rock, especially limestone, base of trees, dead branches, dry rock faces in canyons


Orthotrichum anomalum - Photo by Keith Bowman

Orthotrichum elegans Schwagrichen ex Hooker & Greville
=*Orthotrichum speciosum* var. *elegans*
Rarity: S1
Substrates: deciduous trees, (especially *Populus*), conifers

Orthotrichum lescurii Austin
Substrates: calcareous rock

Orthotrichum obtusifolium Brid.

Rarity: S1
Substrates: tree trunks (*Populus, Juniperus,* aspen)
Habitats: river bottoms

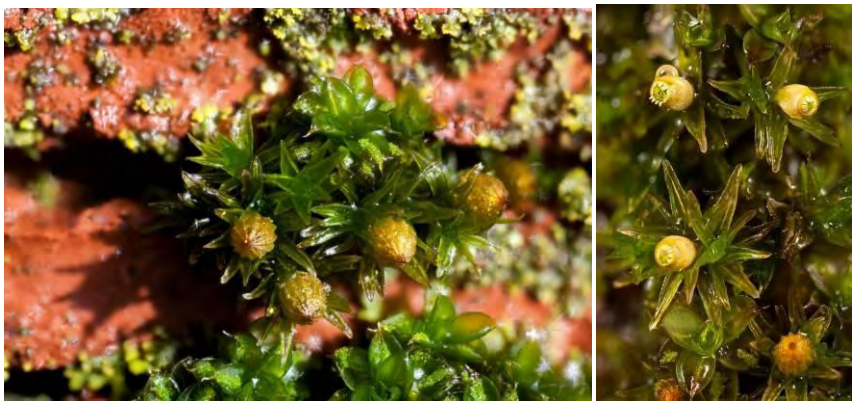
Orthotricum obtusifolium – Photo by © Michael Lüth

Orthotrichum ohioense Sull. & Lesq.

Rarity : S1/2
Substrates: deciduous trees
Habitats: mesic hardwood forests, along streams

Orthotrichum pumilum Sw.

Substrates: trunks, lower branches, base of deciduous trees, coniferous trees
Habitats: crevices of rock, open, hardwood forests, trees along roadsides



Orthotrichum pumilum - Photos by Bob Klips

Orthotrichum pusillum Mitt.

Rarity: S1/2
Substrates: trunks of deciduous trees
Habitats: open, dry woods, roadsides, (on *Juniperus*) along streams

Orthotrichum sordidum Sull. & Lesq

Substrates: trunks of deciduous and coniferous trees, boulders
Habitats: hardwood forests

Orthotrichum stellatum Brid.

Substrates: hardwood tree trunks

Habitats: moist forests, shaded stream edges

Orthotrichum strangulatum P. Beauv.

=Orthotrichum lescurii (in part)

Substrates: dry, exposed, calcareous or dolomite bluffs, rock faces

Orthotrichum strangulatum - Photo by Bob Klips

Ulota

Substrates: rock (acidic), trees (trunks, branches, deciduous, conifer, *Betula*)
Habitats:

CoC: 4
Indicator Status: FAC

New Jersey plants are small to medium-sized, in tufts or loose cushions. The stems are erect or rarely creeping and the branches are erect to ascending. The leaves are straight and not crisped to flexuose and crisped when dry and erect-spreading to spreading-flexuose when moist. Leaves are lanceolate, oblong-lanceolate, or linear-lanceolate in shape with an acuminate, acute, or narrowly obtuse apex. Leaf margins are entire. The costa extends to near the apex or rarely beyond (excurrent). At least some of the leaf cells are roughened due to papillae (1 or 2 per cell). The seta is 1-10 mm tall. Capsules are fully exserted, fusiform-cylindric, ovate-oblong, or rarely obovate in shape, slightly 8-plicate at mouth to strongly 8-ribbed the entire length or rarely smooth, and the mouth puckered or the capsule more or less constricted below mouth.

Species

Ulota coarctata (P.Beauv.) Hammar
Rarity: S1
Substrates: trunks and branches (deciduous and conifer trees)

Ulota coarctata – Photo by © Michael Lüth

Ulota crispa (Hedw.) Brid.
Substrates: branches and trunks of trees (*Betula*)


Ulota crispa - Photo by Keith Bowman

Ulota hutchinsiae (Sm.) Hammar

Rarity: S1

Substrates: acidic rock

Ulota hutchinsiae - Photo by Bob Klips

Plagiotheciaceae

Plagiothecium

Substrates: soil or humus (shaded, overlying boulders and cliffs), rotten logs, stumps, base of trees.
Habitats: woodlands (coniferous, inundated), swamps, fens, marshes

CoC: 6
Indicator Status: FAC

New Jersey plants are dark green to yellow-green, glossy or sometimes dull. The stems are typically 2-6 cm long and 0.5-4 mm wide across. The stems may be erect or prostrate and rounded and wormlike (julaceous) or flattened (complanata-foliate). The leaves can be symmetric or asymmetric and 0.7-4 mm long. The seta is yellow or orange to red-brown. Capsules are yellowish, orange-brown, reddish, light brown, or dark red when mature, oblong to ovoid in shape, smooth to ridged (striate), often wrinkled at the neck, and often contracted below mouth when dry.

Species

Plagiothecium cavifolium (Brid.) Iwats.

Substrates: shaded soil or humus (overlying boulders and cliffs), rotten logs, stumps, base of trees.

Plagiothecium cavifolium - Photo by Bob Klips

Plagiothecium denticulatum (Hedw.) Schimp.

Substrates: rotten logs, stumps, base of trees, humus or soil (overlying boulders and cliffs)
Habitats: woodlands

Plagiothecium denticulatum - Photo by Bob Klips

Plagiothecium laetum Schimp.

Rarity: S1

Substrates: rotten logs, stumps, base of trees, humus, soil (overlying boulders and cliffs)

Habitats: coniferous woods

Plagiothecium laetum – Photo by © Michael Lüth

Plagiothecium latebricola Schimp.

Rarity: S1

Substrates: rotten logs, stumps, base of trees, humus

Habitats: swamps, fens, marshes, inundated woods

Plagiothecium latebricola – Photo by © Michael Lüth

Polytrichaceae

Atrichum

Substrates: soil (sandy, exposed), humus, rotting logs (rarely)
Habitats: soil banks (along roads, trails), ditches (shaded) hummocks in clearings in woodlands (open or semishaded), along streams (wet banks), margins of fens, swamps, and marshes

CoC: 4
Indicator Status: FAC

New Jersey plants are small to robust forming loose tufts. Stems are typically unbranched, but may rarely be sparingly branched. The leaves are strongly crisped and contorted when dry and widely spreading and plane to more or less distinctly concave when moist. Leaf margins are differentiated and toothed to the middle of the leaf or below with single or paired teeth (the teeth and cells of leaf border are roughened in *A. crispum*). The costa is narrow, toothed on the lowerside of the leaf in upper half or rarely smooth and bearing lamellae on the upper side of the leaf. The individual lamellae are sheets of cells arising from the costa surface and running along the length of the costa and can be distinguished with magnification. The lamellae are more or less straight or tall with wavy (sinuous) margins, but may rarely be rudimentary, or almost absent. The leaves may be nearly plane or wavy (undulate) and toothed along the undulations on the underside. Leaf cells may be smooth or slightly convex on both surfaces (adaxial surface bulging-mammillose in *A. angustatum*), or roughened with minute rounded papillae. The seta is usually 1 per perichaetium, but there can be as many as 3, straight to flexuose, smooth, but twisted near the capsule when dry. Capsules are short- to long-cylindric in shape, more or less straight to curved (arcuate), rounded in cross-section (terete), finely ridged (striate) when dry, and lacking a basal constriction.

Species

Atrichum altecristatum (Ren. & Card.) Smyth & Smyth

Habitats: soil banks along roads, trails, hummocks in clearings in woodlands (open or semishaded conditions)

Atrichum altecristatum - Photo by Bob Klips

Atrichum angustatum (Brid.) Bruch & Schimp.

Substrates: exposed soil

Habitats: banks along roads and trails in woods

Atrichum angustatum - Photo by Bob Klips

Atrichum crispulum Bescherelle

=*Atrichum oerstedianum*

Substrates: soil, humus

Habitats: (mostly shaded habitats) often wet banks along streams, margins of fens and swamps

Atrichum crispum (James) Sull.

Substrates: sandy soil, rotting logs (rarely)

Habitats: along streams, roadside ditches (shaded habitats), margins of swamps and marshes, woods

Pogonatum

Substrates: soil (bare, sand, clay), steep banks (moist, clay, silt)
Habitats: banks of ditches or streams (usually open situations)

CoC: 3
Indicator Status: FACU

New Jersey plants are typically less than 0.5 cm and found as individual deep-green, or dull brownish stems scattered over a persistent bright green or dull green protonemal mat that may turn red-brown with age. The stems are simple. The leaves have a sheathing base that merges with a blade and the sheath is entire. Leaf margins are toothed or entire without a differentiated border. Numerous and compact lamellae arise from the upper surface of the leaf and occupy the full width of the blade. The seta is smooth. Capsules are ovoid to short-cylindric in shape, more or less regular to somewhat asymmetric, rounded in cross section (terete), or sometimes with 4 or more indistinct angles or ridges.

Species

Pogonatum brachyphyllum (Michx.) P. Beauv.
Substrates: bare sandy or clayey soil
Habitats: banks of ditches or streams (usually open situations)

Pogonatum pensilvanicum (Hedw.) P. Beauv.
Substrates: (pioneer) steep banks of moist clay or silt

Pogonatum pensilvanicum - Photo by Bob Klips

Polytrichastrum

Substrates: soil, humus, rocks
Habitats: damp to wet, chiefly coniferous forests dry to moist woods moist coniferous or hardwood forests

CoC: 5 (?)
Indicator Status: FAC

New Jersey plants are medium-sized to robust, in loose tufts. The stems arise from short underground rhizomes and are unbranched, although they can sometimes be sparingly branched. The leaves are more or less differentiated into a sheathing base and a divergent blade. The sheath is entire, hyaline-margined, and more or less abruptly contracted to the blade. Blade margins are sharply toothed to entire. The costa typically extends beyond the leaf apex (short-excurrent) or (in perichaetial leaves) into a toothed awn. The apex may rarely be hooded (cucullate). Numerous lamellae arise from the upper leaf surface are closely spaced and cover most of the upper surface of the blade. Leaf margins are more or less entire, finely toothed (sharp or rounded). The seta is solitary. Capsules are rounded in cross-section (terete) or more commonly 4-6 angled with the hypophysis tapering or distinct and cylindric but not sharply delimited.

Species

Polytrichastrum formosum (Hedwig) G. L. Smith
=*Polytrichum formosum*
Substrates: soil or humus
Habitats: damp to wet, chiefly coniferous forests

Polytrichastrum formosum – Photo by © Michael Lüth

Polytrichastrum ohioense (Renauld & Cardot) G. L. Smith

Substrates: soil, humus, rocks

Habitats: dry to moist woods

Polytrichastrum ohioense - Photos by Bob Klips

Polytrichastrum pallidisetum (Funck) G. L. Smith

Rarity: S1

Substrates: soil, humus, rocks

Habitats: moist coniferous or hardwood forests

Polytrichastrum pallidisetum – Photos by © Michael Lüth

Polytrichum

Substrates: soil (moist, well-drained, acid, sandy, gravelly, organic, exposed, overlying rocks and boulders), humus, rotten stumps
Habitats: wet habitats, pastures, old fields, meadows (sedge), peatlands, margins of bogs (*Sphagnum*) or swamps, heaths (wet), spruce forests (wet), open woods, roadside banks, openings following forest fire, trailside banks, road cuts, blowdowns, open ridge tops, rocky ridges and moraines

CoC: 4
Indicator Status: FAC

New Jersey plants form medium-sized to tall and robust loose to compact tufts. Stems arise from a horizontal underground rhizome and are loosely to densely leafed above with rhizoids at the base of the stem or rarely forming a wooly covering (tomentum) throughout. The leaves have a differentiated sheath and blade. The sheath is entire, often highly glossy, with a hyaline-margin. The blade margins are narrow, plane or erect and may be sharply toothed with stout, unicellular teeth or entire, broadened and more or less sharply inflexed, enclosing the lamellae (*P. juniperinum, P. piliferum, P. strictum*). The costa is typically extending beyond the leaf apex into a short tip (short-excurrent) or long, spinulose awn. The lamellae are numerous and closely spaced. The seta is solitary. Capsules are typically 4-angled, although they may sometimes be 5-angled and often somewhat broader toward the base forming winged or knife-edge angles following the shedding of the operculum. The capsules are suberect when young but become almost horizontal, with a disc-shaped hypophysis that is sharply separated from the urn by a deep basal constriction.

Species

Polytrichum commune Hedw.

Substrates: moist organic soil
Habitats: (often covering extensive areas) wet habitats, pastures, old fields, and meadows, peatlands, margins of bogs or swamps

Polytrichum commune - Photos by Bob Klips

Polytrichum commune var. *perigoniale* (Michx.) Hampe

Rarity: S1

Substrates: humus and moist sandy soil

Habitats: open woods, roadside banks

Polytrichum juniperinum Hedw.

Substrates: exposed, well-drained, mostly acid soils (thin and overlying rocks)

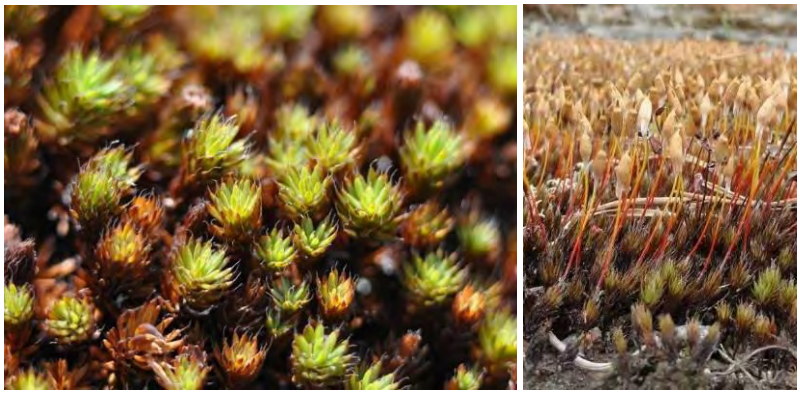
Habitats: old fields and open woods, in openings following forest fire, on trailside banks and road cuts, blowdowns and open ridge topes near timberline, only rarely in moist or wet situations

Polytrichum juniperinum - Photo by Bob Klips

Polytrichum piliferum Hedw.

Substrates: shallow well-drained sandy or gravelly soil over rocks and boulders (sunny situations)

Habitats: road cuts, old fields, burned over areas, heaths, rocky ridges and moraines



Polytrichum piliferum - Photo by Keith Bowman

Polytrichum strictum Brid.

Rarity: S1

Substrates: rotten stumps

Habitats: Sphagnum bogs, wet heaths, sedge meadows, wet spruce forests

Polytrichum strictum – Photo by © Michael Lüth

Pottiaceae

Acaulon

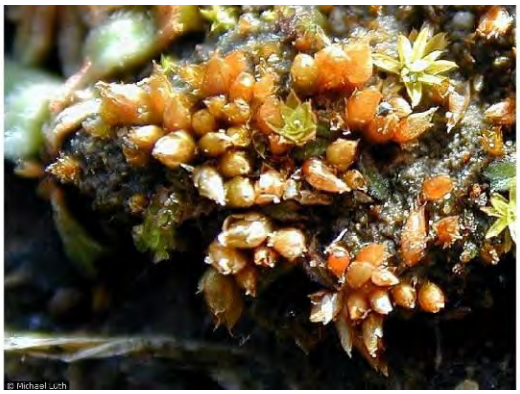
Substrates: soil (sand, clay)
Habitats: gravel pit, pasture, lawn, old fields, roadside banks, temporarily moist areas

CoC: 3
Indicator Status: UPL

New Jersey plants are short, reddish to yellowish brown above and brown below, and bulb-shaped and grow scattered or in more dense assemblages (gregarious). The stems are to 0.5 mm tall. Stem leaves strongly appressed with apices that are usually reflexed when dry and appressed to weakly spreading when moist. The leaves are ovate in shape, 0.5-1.75 mm long, and deeply concave. The lower margins are not differentiated, but the upper leaf margins are plane or very weakly recurved, entire to variously toothed, with a broadly acute or abruptly apiculate apex. The costa extends beyond the leaf apex (excurrent) in a stout, sharp apiculus, or occasionally a short somewhat toothed awn. The leaf cells are smooth or roughened due to papillae (large and simple, one per lumen). The seta is very short extending to only 0.2 mm. Capsules lack an operculum (cleistocarpous) are spherical in shape, and are about 0.4-0.7 mm long.

Species

Acaulon muticum (Hedw.) C. Mull.
=*A. muticum* var. *rufescens*
Rarity: S1
Substrates: soil
Habitats: gravel pit, pasture, lawn



Acaulon muticum – Photo by © Michael Lüth

Acaulon triquetrum (Spruce) Mull. Hal.

Substrates: soil, sand, clay

Habitats: old fields, pastures, roadside banks, temporarily moist areas

Acaulon triquetrum – Photo by © Michael Lüth

Barbula

Substrates: rock (sandstone, granite, limestone), soil (clay, sand, on rock), gravel, cement, associated with limestone or dolomite, bricks, mortar, walls, stumps
Habitats: woods, fields, road-cuts, paths, lawns, ditches

CoC: 2
Indicator Status: UPL

New Jersey plants form loose tufts (caespitose) or cushions that are yellowish brown, brown or blackish above and yellowish brown to reddish brown below. The stems are short to elongate up to 3.5 cm. The leaves are appressed and incurved to weakly spreading, often contorted or twisted about stem, occasionally catenulate when dry and spreading when moist. Leaves are strap-shaped (ligulate) or broadly concave, with bases that may be weakly differentiated to broadened and somewhat sheathing. The leaf apex is rounded to obtusely acute, usually mucronate, but occasionally entire or apiculate. Leaf margins are usually recurved in the lower half or more, occasionally plane throughout, and entire or occasionally weakly toothed near the apex. The costa extends to the apex (percurrent) or beyond (short excurrent) as a sharp point (mucro), or may occasionally end a few cells before the apex. Leaf cells are roughened by papillae (2-3 per lumen), smooth, or bulging. The seta is 0.5-2.5 cm tall. Capsules have an operculum and are ovate to long-cylindric in shape.

Species

Barbula convoluta Hedw.

Rarity: S1/2
Substrates: rock, soil, sand, thin soil on rock, gravel, cement, often associated with limestone or dolomite, bricks and mortar, walls, stumps
Habitats: woods, fields

Barbula convolute – Photo by © Michael Lüth

Barbula indica (Hook.) Spreng.

Rarity: S1

Substrates: Soil, clay, limestone, cement, walls

Barbula unguiculata Hedwig

Substrates: soil, sand, gravel, sandstone, granite, limestone, walls,

Habitats: roadcuts, paths, lawns, ditches

Barbula unguiculata - Photo by Bob Klips

Bryoerythrophyllum

Substrates: soil, rock (limestone, dolomite, gypsum, siliceous), mortar of wall, bark
Habitats: bluffs, forested and boggy areas, stream banks, lake shores

CoC: 4
Indicator Status: FACW

New Jersey plants are form turfs or loose tufts (caespitose) that are green above and red-brown below. Stems often short, but may reach 2 cm tall in sterile plants. Stem leaves are oblong-lanceolate to long-lanceolate, or occasionally ovate and 1.5-3.5 mm long with an acute to broadly acute apex. Leaf margins are recurved in lower 75% of the leaf or sometimes to theapex and are entire or toothed at the apex. The costa extends to the leaf apex (percurrent) or end 1-4 cells below the apex and is weakly convex or concave on the upper surface. The seta is elongate, usually more than 1 cm tall. Capsules have an operculum, are ellipsoidal to cylindric in shape, occasionally curved, and short to rather long (0.8-2.2 mm).

Species

Bryoerythrophyllum recurvirostrum (Hedwig) P.C. Chen

Didymodon

Substrates: soil (moist, clay, silt), conglomerate, rock (limestone, dolomite, sandstone, gypsum, shale, calcareous), concrete, culverts
Habitats: ledges, outcrops, cliffs, wet areas, moist areas, seepage, waterfalls

CoC: 3
Indicator Status: FACU

New Jersey plants form turfs or cushions that are light to blackish, olive or reddish green above and brown to reddish brown or tan below. The stems grow to 2.5 cm. The leaves are crowded, appressed-incurved, and occasionally twisted or curled when dry and spreading to strongly reflexed and occasionally keeled when moist. The leaves are 0.4-3 mm long or sometimes longer, ovate to long-lanceolate or long-triangular in shape with the upper surface usually broadly concave or occasionally channeled. The leaf apex narrowly short pointed (acute) to rounded and occasionally fragile or deciduous and falling off early (caduceus). The upper leaf margins are plane to recurved or revolute and smooth (entire) or occasionally weakly toothed (rounded or sharp). The costa extends to just several cells below the apex to just beyond the apex (short-excurrent). Leaf cells are smooth to roughened (papillose). The seta is yellowish to reddish brown, mostly 0.6-1.2 cm long, and twisted clockwise below and occasionally counterclockwise above. Capsules are operculate, elliptic to cylindric in shape, and about 0.6-1.5 mm long.

Species

Didymodon fallax (Hedw.) Zand.

Rarity: S1/2
Substrates: soil silt, conglomerate, dolomite, sandstone, concrete, culverts, gypsum, shale, calcareous rock

Didymodon fallax – Photo by © Michael Lüth

Didymodon ferrugineus (Schimper ex Bescherelle) M. O. Hill
=*Didymodon fallax* var. *reflexus*
Rarity: S1
Substrates: soil, limestone
Habitats: ledges and outcrops, wet areas

Didymodon tophaceus (Bridel) Lisa
Substrates: limestone, limy shale, dolomite, rock, moist clay
Habitats: cliffs, moist areas, seepage, waterfalls

Didymodon tophaseus – Photo by © Michael Lüth

Gymnostomum

Substrates: calcareous rock, wet soil (rarely)
Habitats: siturations, especially near waterfalls, moist gorge walls

CoC: 6
Indicator Status: FACU

New Jersey plants are light to dark green forming tufts (caespitose), crowded or rarely dense turfs. The leaves are appressed to appressed-incurved when dry and weakly spreading to spreading recurved when moist. Stem leaves are long-rectangular or long-elliptical to broadly lanceolate, straight to strongly reflexed, and 0.5-2 mm long with a rounded to broadly acute, occasionally apiculate apex. The costa extends to from just below the apex (subpercurrent) to the apex (percurrent). Leaf cells are roughened by papillae (3-5 per lumen). The seta is yellowish to reddish brown in color, generally 0.3-0.6 cm, and twisted clockwise. Capsules are yellowish to reddish brown, long- or rarely short-cylindric in shape, and 1.4-1.8 mm long or occasionally shorter.

Species

Gymnostomum aeruginosum Sm.

Rarity: S1/2

Gymnostomum aeruginosum - Photo by Bob Klips

Hymenostylium

Substrates: limestone and calcareous rocks and sediments
Habitats: calcareous regions, seepy bluffs, seepy ledges and cracks, moist soil along waterfalls, streams and rivers, cedar barrens (sandstone), forested and exposed sites

CoC: 7
Indicator Status: FACU

New Jersey plants form soft, dense tufts, cushions or sods that are yellow- to dark green above and pale brown below, or sordid brown throughout and the young leaves may occasionally be red tinged. Stems are often sparingly branched and typically 0.5-7 cm tall, but may occasionally reach 10 cm long. Rhizomes are typically found in abundance on the lower stem, but may occasionally reach the stem apex. The leaves erect-spreading wet or dry, usually less than 2 mm long and linear- to oblong-lanceolate in shape with a sharp to blunt short pointed (acute) apex, but the apex may sometimes be longer tapered (apiculate) with a clear cell, acuminate-mucronate, or even obtuse to round. Leaf margins are narrowly recurved below. The costa extends to about 2-6 cells below the apex, to the leaf apex (percurrent) or beyond (excurrent) as a stout tip (mucro). The cells of the lower side of the leaf are smooth or roughened by papillae (1-3 per lumen). The yellow seta becomes red-brown with age, is twisted clockwise, and stand 0.5-1 cm tall. Capsules are yellow to red-brown, variably globose, ovoid, obovoid, or subcylindric in shape, and about 0.5-1 mm long.

Species

Hymenostylium recurvirostrum (Hedw.) Dix.
Rarity: S1

Hyophila

Substrates: sedimentary rocks (loosely consolidated), soft limestone
Habitats: rocky riverbanks, streamsides and bluffs in shaded woods

CoC: 7
Indicator Status: FAC

New Jersey plants form loose or dense, dark green to red-brown or blackish tufts that may be dull or occasionally have a metallic sheen. The stems are densely foliate and typically 5-10 mm, but occasionally up to 20 mm tall. The leaves are concave when moist, up to 2.5 mm long, and oblong-spatulate to obovate with a rounded to rounded obtuse apex, or sometimes tapered to a point (apiculate). There are occasionally teeth in the upper 25% of the leaf margin. The costa is stout and prominent on the lower side of the leaf where it is smooth to occasionally roughed at the leaf apex. The leaf cells are typically bulging on the upper surface and flattened on the lower side. The seta is 6-7 mm tall and becoming reddish to yellow-brown with age. Capsules are erect, narrowly cylindric in shape from an indistinct neck, and 1.5-3 mm long.

Species

Hyophila involuta (Hook.) Jaeg.

Rarity: S1/2

Hyophila involuta - Photo by Bob Klips

Syntrichia

Substrates: bark of trees, rock, rock crevices, soil (dry to moist)
Habitats:

CoC: 5 (?)
Indicator Status: FACU

New Jersey plants form small to large green to yellow- or red-brown tufts. The stems are simple or forked. The leaves are appressed and variously twisted when dry and erect-spreading to squarrose when moist. The leaves are obovate, spatulate, or lingulate, rarely broadly oblong-lanceolate in shape with acute to truncate or emarginate, and often apiculate apices. Leaf margins are plane or revolute and usually entire. The costa is generally strong and extending to the apex (percurrent) to beyond (long-excurrent) forming a hyaline or colored awn, which can be smooth or roughened. The marginal cells of the leaf are sometimes differentiated, which may be visible in the field as a thicker-wall and different in color. Some species have obvious propagules on the upper surface of the costa (*S. papillosa*- spherical or ovoid gemmae) or the stem tip in the axils of the upper leaves (*S. laevipila*). The seta is red or brown, elongate, and smooth. Capsules are erect, straight or slightly curved, red or brown, cylindric in shape sometimes with a distinct neck, and usually ridged (striolate) when dry.

Species

Syntrichia laevipilia Brid.
=Tortula pagorum
Rarity: S1
Substrates: on bark of trees (occasional), rock (rarely)

Syntrichia laevipilia - Photo by Bob Klips

Syntrichia papillosa (Wilson) Juratzka

=Tortula papillosa

Rarity: S1

Substrates: bark of trees, rock crevices

Syntrichia papillosa - Photo by Bob Klips

Syntrichia ruralis (Hedwig) F. Weber & D. Mohr

=Tortula ruralis

Rarity: S1

Substrates: dry to moist soil and rock

Syntrichia ruralis - Photo by Keith Bowman

Tortella

Substrates: rock (acid or calcareous), rock crevices and surfaces, peaty humus, logs, soil (open, sand, humic, peaty), bark a the base of trees, organic debris, mortar and brick, concrete, rotten wood
Habitats: seepages, cliffs (crevices, ledges) maritime situations, prairies (dry), springs, fens, *Thuja* swamps, lake shores, bogs, near steams, forests (coniferous, deciduous, maritime, inland), dry, exposed or moist and shaded stations, calcareous regions, rock crevices (exposed or forest-shaded), boulders, wooded hillsides (dry)

CoC: 7
Indicator Status: FACU

New Jersey plants are small to medium-sized and form loose or dense tufts, mats or compact sods that are dull green, yellowish to dark green above and black, brown or tan below. The stems are erect and often branched. The stem leaves crispate to incurved when dry and spreading to recurved when moist. The leaves are elongate-oblong to linear-lanceolate or linear-subulate that is widest at or near the base with and acute or obtuse apex, hooded (cucullate) or concave, and with an apiculus, mucro or short subula. Leaf margins are plane to incurved near the leaf apex and generally entire and roughened by projecting papillae or otherwise varied in texture (occasionally somewhat to strongly wavy (undulate)). The costa is typically prominent and extending to the leaf apex (percurrent) or beyond (short-excurrent). Although the cells lower on the leaf are smoother, the upper leaf cells are roughened by papillae on both surfaces. The seta is 1-2 per perichaetium, yellow or reddish below with age, smooth, and may stand as much as 3 cm tall. Capsule are erect and symmetric or slightly inclined, yellow to reddish brown and darker red or brown at the mouth, elliptic to cylindric in shape, and more or less wrinkled-plicate when dry and empty.

Species

Tortella fragilis (Hook. & Wils.) Limpr.

Rarity: S1
Substrates: substrate probably dessicated some of the year, acid or calcareous rock, logs, peaty humus, open sands
Habitats: seepages, crevices and ledges of cliffs in maritime situations, dry prairies, springs, fens, *Thuja* swamps, lake shores

Tortella fragilis – Photo by © Michael Lüth

Tortella humilis (Hedw.) Jenn.

Substrates: bark a the base of trees, acid or basic substrates, rock crevices and surfaces, sandy or humic soil, organic debris, mortar and brick, concrete, maritime and inland forests

Habitats: *Thuja* swamps and bogs, near steams, hard and soft wood forests, dry, exposed or moist and shaded stations

Tortella humilis - Photo by Bob Klips

Tortella tortuosa (Hedw.) Limpr.

Rarity: S1

Substrates: rock, peaty soil and rotten wood

Habitats: calcareous regions, exposed or forest-shaded rock crevices, boulders, ledges of mountains, dry wooded hillsides, wet areas such as *Thuja* swamps, banks of streams over humus, river margins

Tortella tortuosa - Photo by Keith Bowman

Tortula

Substrates: soil, calcareous rock, bricks or walls
Habitats: lawns, fields, banks, crevices, ledges

CoC: 5
Indicator Status: FACU

New Jersey plants form green cushions that are sometimes blackish green above and yellow-brown to dark brown below. Stems are usually up to 2 cm tall and may branch occasionally. The rhizoids are often dense. Leaves are appressed-incurved to lax when dry and weak to wide-spreading when moist. Leaves are variable in shape ranging from obovate to spathulate, ovate to elliptical, and may be ligulate (strap-shaped) and 1-4 or upto 6 mm long. The leaf apex is broadly acute to rounded. Upper leaf surface can be flat to concave and broadly channeled, or grooved along the costa. The leaf margins are recurved below or sometimes plane and entire to lightly toothed at the apex, and occasionally differentiated. The costa extends to just below the apex, to the apex or beyond to form a short to long awn. The leaf cells may be smooth or roughened by 4-6 papillae per cell on the upper and lower leaf surface. The seta may be twisted counterclockwise, yellowish brown or brown in color and extend up to 2.5 cm tall. Capsules are yellowish brown or dark brown, usually lidded (some species are not), spherical, ovate, elliptic or cylindric in shape, and typically 0.5-3 mm long, but may reach 7 mm in length.

Species

Tortula acaulon (Withering) R. H. Zander
=Phascum cuspidatum
Rarity: S1
Substrates: soil
Habitats: lawns, fields, banks

Tortula acaulon - Photo by Bob Klips

Tortula muralis Hedw.

Rarity: S1/2

Substrates: calcareous rock, (often) bricks or walls

Tortula muralis – Photo by © Michael Lüth

Tortula obtusifolia (Schwagrichen) Mathieu

=Desmatodon obtusifolius

Rarity: S1

Substrates: soil, rock, limestone, calcareous sandstone, stone walls

Habitats: crevices, ledges

Tortula obtusifolia - Photos by Bob Klips

Tortula plinthobia (Sullivant & Lesquereux) Austin

Substrates: calcareous rocks, concrete, mortar, pavements, walls

Habitats: sedimentary outcrops

Tortula porteri (James) Brotherus

Substrates: Limestone or dolomitic rock

Tortula truncata (Hedwig) Mitten

=Pottia truncata

Rarity: S1

Substrates: soil (calcareous, with grasses)

Habitats: fields, lawns, roadsides

Pottia truncata - Photo by Bob Klips

Trichostomum

Substrates: soil, sandstone, calcareous rock, bluffs, boulders, logs
Habitats: bluffs, under overhanging ledges, seepage areas

CoC: 6
Indicator Status: FACU

New Jersey plants are form turfs that are yellowish green above and medium brown to light brown below (basally). The stems can reach about 3 cm. The leaves are flattened and lanceolate with an acute apex that may be plane or keeled. The upper margin is plane, entire or weakly toothed, and not bordered. Although it may be difficult to see in the field under low magnification, the clear basal cells form a U or V- shape and commonly run up margins. The upper leaf cells are roughened by multiple papillae. The seta is 0.4-1.5 cm tall. Capsules typically possess a lid (operculum), but some do not. The capsules are cylindric, ovate or elliptic in shape and about 1-3 mm long.

Species

Trichostomum tenuirostre (Hooker & Taylor) Lindberg
=*Oxystegus tenuirostris*
Rarity: S1

Trichostomum tenuirostre - Photo by Bob Klips

Weissia

Substrates: soil, rock (acid or calcareous substrates)
Habitats: (among grasses) disturbed areas, lawns, fields, roadsides

CoC: 2
Indicator Status: FACU

New Jersey plants are loosely tufted (caespitose) or form low cushions or turfs that are green above and brown to tan or yellow below. The stems can reach 1 cm in length. The leaves are incurved, commonly tubulose and often contorted or spiraled when dry and spreading when moist. The leaves are long-ligulate (strap-shaped), oblong or triangular to long-lanceolate, and typically 1.5-2.5, but occasionally up to 4 mm. The upper surfaces of the leaves are broadly channeled. The leaf apices are sharply acute to subulate, occasionally broadly acute, obtuse, or weakly hooded (cucullate). The leaf margins near the leaf apex are usually sharply incurved, but can occasionally be erect, or plane and the margins are entire. The costa extends beyond the leaf apex in a short and sharp tip. Leaf cells are roughened by papillae. The seta is short standing only 0.1-0.3 cm tall. Capsules possess or lack a lid (operculum), are elliptical to short-ovate or cylindric in shape, and 1-2.2 mm long.

Species

Weissia controversa Hedw.
Substrates: (weedy) soil, rock (acid or calcareous substrates)
Habitats: disturbed areas, roadsides, fields

Weissia controversa - Photo by Bob Klips

Weissia brachycarpa (Nees & Hornschuch) Juratzka
=*Weissia hedwigii*
Substrates: soil, limestone rocks
Habitats: grassy areas

Weissia muehlenbergiana (Swartz) W. D. Reese & B. A. E. Lemmon
=*Astomum muehlenbergiana*

Rarity: S1
Substrates: soil
Habitats: lawns, fields, among grasses, roadsides

Weissia muehlenbergiana - Photo by Bob Klips

Pterigynandraceae

Myurella

Substrates: calcareous rock
Habitats: calcareous habitats, seepages, rock crevices (mesic), fens, montane areas with calcareous rock

CoC: 7
Indicator Status: FAC

New Jersey plants are pale green, yellow-green, or glaucous green and threadlike. The stems are simple to irregularly branched. The leaves are erect to wide-spreading, overlapping (imbricate) or widely spaced. The leaves are round to ovate in shape with an obtuse, acuminate, or apiculate apex. Leaf margins are erect and nearly entire to variously toothed. The costa is single, double, short, weak, or almost absent. The leaf cells are faintly to distinctly roughened due to upturned cell ends or papillae. Capsules are erect to nearly horizontal, cylindric in shape, and symmetric.

Species

Myurella sibirica (C. Mull.) Reim.
Rarity: S1
Habitats: mesic, calcareous rock crevices

Myurella julacea (Schwaegr.) Schimp.
Rarity: S1
Habitats: calcareous habitats, seepages, rock crevices, fens, montane areas with calcareous rock

Myurella julacea – Photo by © Michael Lüth

Pterigynandrum

Substrates: mesic, rock shelves, acidic rock
Habitats: montane forests

CoC: 4
Indicator Status: FACU

New Jersey plants form green to yellow-green pendent to prostrate mats. The stems are freely and irregularly branched. The leaves are erect, somewhat falcate to pointed in one direction (homomallous), and overlapping (imbricate). The leaves are oblong elliptic and 0.6-1 mm in length with an obtuse to acute apex. Leaf margins are narrowly reflexed below, erect and toothed above. The costa is double, short, and narrow. The leaf cells are roughened by upturned cell end on the underside of the leaf. The seta is 0.5-1.5 cm tall. Capsules are erect, cylindric in shape, symmetric, and 1-2.5 mm long.

Species

Pterigynandrum filiforme Hedw.

Rarity: S1

Pterigynandrum filiforme – Photo by © Michael Lüth

Ptychomitriaceae

Campylostelium

Substrates: acidic sandstone boulders, cliffs, and sandstone rock shelters
Habitats: forests or openings

CoC: 8
Indicator Status: UPL

New Jersey plants are small and glossy in yellowish green loose turfs or tufts (caespitose). The stems are erect. Leaves loosely crispate to curved in to an almost circle (circinate) when dry, or linear from a slightly broader base, and 2-3 mm long. The leaf apices are acute or almost hooded (subcucullate). Leaf margins are erect and entire. The leaf cells are smooth. The seta is twisted below the capsule and often flexuous when dry and recurved when wet standing 5-7 mm tall. Capsules are 1-1.2 mm long, ovoid-cylindric in shape, and smooth or slightly wrinkled when dry.

Species
Campylostelium saxicola (F. Weber & D. Mohr) Bruch & Schimper
=Campylium saxicola
Rarity: S1

Campylostelium saxicola – Photo by © Michael Lüth

Ptychomitrium

Substrates: acidic and calcareous rocks, soil, (very rarely) tree bark
Habitats: open forests

CoC: 5
Indicator Status: FACU

New Jersey plants form small glossy dark green tufts (caespitose). The stems are erect or creeping (repent) and upto 0.5 cm tall. The leaves are oblong-lanceolate in shape with a variously hooded (cucullate to subcucullate) apex, 2 mm long, and erect to crispate when dry. Leaf margins are entire to variously toothed. Leaf cells are smooth or only slightly roughened due to papillae. There is only 1 seta per perichaetium and it is straight and stands 2-3 mm tall. Capsules are ovoid in shape, 0.75-1 mm long, and smooth or wrinkled when dry.

Species

Ptychomitrium incurvum (Schwaegr.) Spruce
Rarity: S1/2

Rhabdoweisiaceae

Oncophorus

Substrates: rotten logs, (less commonly) soil, humus, rock (moist) or bark at the base of coniferous trees (eg. *Thuja*)
Habitats: along streams or in flooded areas

CoC: 5
Indicator Status: FAC

New Jersey plants are erect and form loose to dense green to yellow-brown tufts that may be glossy to somewhat dull. The stems are typically 1-5 cm tall, but may reach 8 cm in height, are erect-spreading, and may be simple or branched. Rhizoids are found along the lower portion of the stem. The leaves are lanceolate from an ovate base that narrows gradually to abruptly to an awl-shaped (subulate) apex and are crisped and curled when dry. Leaf margins are plane or revolute and entire or often toothed at the leaf apex. The costa is strong, but narrow and extends to the leaf apex (percurrent) to just beyond (slightly excurrent). Leaf cells are smooth. The seta is between 5 and 20 mm tall, erect, twisted when dry, and yellow to reddish yellow. The yellow-brown capsules are inclined to horizontal, curved (arcuate), and cylindric in shape. The urn is 0.8-2 mm long, constricted below the mouth, and furrowed or smooth when dry.

Species

Oncophorus virens (Hedwig) Bridel
=Dicranum virens
Substrates: Moist rocks, rotten logs or soil

Oncophorus virens – Photo by © Michael Lüth

Oncophorus wahlenbergii Bridel
Substrates: rotten logs, (less commonly) soil, humus, rock or bark at the base of coniferous trees (eg. *Thuja*)
Habitats: along streams or in flooded areas

Rhytidiaceae

Rhytidium

Substrates: rock, thin layer of soil or humus overlying rock (calcareous or mafic),
Habitats: exposed rock ledges, rocky slopes, bluffs, semi-open dry forests (much less common on moist sites)

CoC: 7
Indicator Status: UPL

New Jersey plants are large to very large (to 10 cm) forming loose yellowish green to golden wefts. The prostrate (procumbent) to erect-ascending stems are turgid from crowded leaves and often end in hooked at apices. The stems are irregularly and sometimes sparsely branched to regularly pinnate with branches up to 10 mm long. There are few rhizoids located at the branch apices and sometimes along the stem. Stem and branch leaves are differentiated by size with the stem leaves larger ranging from 2.8-4.5 mm long and the branch leaves only 1.2-2.3 mm long. The leaves are oblong-ovate, ovate-lanceolate, or lanceolate in shape with an acuminate apex, curved in a single direction, obscurely pleated (plicate), and strongly wrinkled (rugose). The stem leaves are erect, crowded, and overlapping (imbricate). The leaf cells are coarsely roughened by upturned cell ends. Leaf margins are narrowly revolute almost to apex and nearly entire near the base and toothed above. The costa is single although sometimes the costa is spilt in 2, extends 30% - 50% of the leaf lengths and often ending in a terminal spine. The seta is elongate and smooth standing 2-2.5 cm tall. Capsules are oblong-ellipsoid to cylindric, 2-2.5 mm long, sub-erect to horizontal, curved (arcuate), and constricted below the mouth when dry.

Species
Rhytidium rugosum (Hedw.) Kindb.
Rarity: S1/2

Rhytidium rugosum – Photo by © Michael Lüth

Seligeriaceae

Seligeria

Substrates: (calcareous substrates) bare rock
Habitats: crevices and protected areas

CoC: 7
Indicator Status: UPL

New Jersey plants are olive green and minute forming loose tufts (gregarious), or larger and forming compact tufts and cushions. The stems are unbranched to rarely 2-3-branched. Leaves are twisted-spreading to stiffly erect when dry and generally erect-spreading to spreading –recurved, or sometimes slightly curved when moist. The leaves are linear-lanceolate to ovate-lanceolate, linear to stoutly awl-shaped (subulate) from a clasping ovate or oblong base. Leaf margins are plane and entire (*S. recurvata*) to toothed (*S. donniana*). The costa is single, ends near the apex to far beyond (long-excurrent), and filling the subula. Leaf cells are smooth. The seta is straight, flexuose or curving downwards (cygneous) and 1-3 mm long. Capsules are mostly erect, symmetric, cylindric-ovate to turbinate in shape, wider than long, widest at mouth only when old (*S. donniana*) or longer than broad and narrower at the mouth (*S. recurvata*).

Species

Seligeria donniana (Sm.) C. Mull.
Rarity: S1
Substrates: bare calcareous rock
Habitats: crevices and protected areas

Seligeria recurvata (Hedw.) Bruch & Schimp.
Rarity: S1
Substrates: calcareous substrates

Seligeria recurvata – Photo by © Michael Lüth

Sematophyllaceae

Brotherella

Substrates: logs, humus, tree trunks, rock
Habitats: forests

CoC: 5
Indicator Status: FAC

New Jersey plants are medium-sized forming dense pale green to yellow-green mats. The stems are 2-6 cm long flattened (complanate-foliate) and subpinnately to irregularly branched with the leaves strongly curved (falcate-secund) toward their substrate at the stem and branch apices. The leaves are 1-1.5 mm long, ovate in shape and tapering to the apex. Leaf margins are toothed in the acumen. The leaf cells are smooth. The seta is light brown and 1-1.5 cm tall. Capsules are inclined, oblong-cylindric in shape, and somewhat asymmetric.

Species
Brotherella recurvans (Michx.) Fleisch

Brotherella recurvans - Photo by Bob Klips

Hageniella

Substrates: rock (usually somewhat shaded)
Habitats: near streams

CoC: 7
Indicator Status: FACU

New Jersey plants are small forming shallow, dense, glossy, yellowish to golden green or brownish creeping mats. The stems are typically 1-3(-6) cm, shoots facing downward, and irregularly branched. The leaves are appressed to erect-spreading, and sometimes weakly curved in one direction (secund). The leaves are concave, 0.2-0.5 mm long, ovate in shape with a broadly acute apex and the base curving to the insertion point. Leaf margins are toothed at the apex. The costa is lacking (ecostate) or double. Leaf cells are smooth. The seta is red-brown and 1-1.5 cm tall. Capsules are operculate, inclined, sometimes nodding when dry and, ovoid to short-cylindric in shape, asymmetric, slightly curved, and 0.5-1 mm long.

Species

Hageniella micans (Mitten) B. C. Tan & Y. Jia

=Hygrohypnum micans

Rarity: S1

Hageniella micans – Photo by © Michael Lüth

Pylaisiadelpha

Substrates: rock, tree bases and trunks, logs
Habitats: broadleaf woodlands

CoC: 6
Indicator Status: FACU

New Jersey plants are small forming weakly glossy yellowish mats. The stems are red-brown, 1-4 cm long, reclining slender, regularly to irregularly branched, and branches prostrate or sometimes arching upward. The leaves are erect-ascending to curved in on direction (falcate-secund, homomallous) and lanceolate to oblong-lanceolate in shape with a narrowly acuminate apex. The stem leaves are crowded and 0.7-1 mm long. The branch leaves are similar, but slightly smaller. Leaf margins are entire except near the acumen. The costa is absent (ecostate) or double. Leaf cells are smooth. The seta is reddish and 0.5 cm tall. Capsules are erect, ovoid to cylindric in shape, symmetric, and 1 mm long.

Species

Pylaisiadelpha tenuirostris (Bruch & Schimp.) Buck

=Brotherella tenuirostris

Rarity: S1/2

Pylaisiadelpha tenuirostris - Photos by Bob Klips

Sematophyllum

Substrates: wet rock (siliceous), logs, bark of tree bases
Habitats: near streams, cliffs or in swamps

CoC: 6
Indicator Status: FAC

New Jersey plants are small to large forming loose to dense green, yellow-green, golden yellow, or golden brown, glossy or dull mats. The stems are 0.3-5 cm and irregularly branched. The leaves are erect-spreading to strongly curved in one direction (falcate-secund), often pointed in a single direction (homomallous), and oblong-lanceolate, oblong-ovate, or ovate in shape with an acute to acuminate apex. Leaf margins are entire. The costa is absent (ecostate) or double. The leaf cells are smooth. The seta is 0.4-2 cm tall. Capsules are inclined to horizontal or rarely erect and short-cylindric in shape.

Species

Sematophyllum adnatum (Michx.) Britt.
Rarity: S1/2
Substrates: logs, bark of tree bases, rock
Habitats: swamps

Sematophyllum demissum (Wils.) Mitt.
Rarity : S1
Substrates: wet siliceous rock
Habitats: near streams

Sematophyllum demissum – Photo by © Michael Lüth

Sematophyllum marylandicum (C. Mull.) Britt.
Rarity: S1
Substrates: wet rock,
Habitats: by streams, cliffs

Sphagnaceae

Sphagnum

Substrates: various
Habitats: various open or forested wetland habitats, wet forests

CoC: 7 (highly variable)
Indicator Status: OBL

New Jersey plants are typically upright with young branches arranged spirally around stem and in a distinct head (captitulum) at growing apex. The branches are grouped into fascicles along the stem. The fascicles usually contain branches growing out from the stem (spreading) and along the stem (pendent), but they may rarely only include spreading branches. The pendent branches are typically more slender than spreading branches and have a tendency to adhere to and cover the stem. The branch fascicles typically contain 2 spreading and 1-2 pendent branches, but there may be up to 12-14 per fascicle. Some species may lack branches or the branches may not be clearly differentiated. The branch leaves are normally inrolled and broadest about 25% to 35% the distance from the base and more or less tapered to a hooded (cucullate) to involute apex. The stem leaves more or less flat and usually broadest at the base. The stem and branch leaves are composed of alternating inflated, S-shaped to rhomboid clear (hyaline cells) and narrow linear green (chlorophyllous) cells. The hyaline cells are typically fibrillose and porose on branch leaves while stem leaves may be less fibrillose or not at all and less porose or not at all than the branch leaves although these features are not visible under low magnification. The sporophytes consist of a spherical capsule, a very short seta, and a foot, and are exserted on a pseudopodium of gametophytic tissue.

Sphagnum

Section Sphagnum

The swollen and inflated appearance of the spreading branches is the most distinctive feature of this section. The species in this section are typically large and possess a distinct head (capitulum). The colors are quite variable within the section and within individual species. Plants in this section are variable in color and can be pale green, green, yellowish, red, tan, brown, or dark brown. The individual stems can be green, brown or reddish and possess leaves that are commonly as large as or larger than branch leaves. The leaves can be variously tongue shape often with a broad rounded apex and border fringes. The pendent and spreading branches are differentiated. The pendent branches lack the swollen appearance of the spreading branches and are rather slender and often shorter. The fascicles contain 2 - 3 spreading branches and 1 - 3 pendent branches. The branches tend to be green with variously egg-shaped leaves, which have hood-shaped tips, a rough lower surface, and toothed margins.

Species

Sphagnum affine Ren. & Card.

Habitats: (widespread and often ruderal) wide variety of minerotrophic wetlands, forested mires

Sphagnum austinii Sull. ex Aust.

Rarity: S1

Habitats: ombrotrophic mires and large hummocks in blanket mires

Sphagnum centrale C. Jens.

Rarity: S1

Habitats: medium to rich fens (coniferous and sedge)

Sphagnum centrale – Photo by © Michael Lüth

Sphagnum henryense Warnst.

=Sphagnum palustre

Habitats: poor to medium fens (wooded), pond margins.

Sphagnum magellanicum Brid.

Habitats: (wide ecological amplitude) ombrotrophic to rich fen peatlands, mires (forested and open)

Sphagnum magellanicum – Photo by © Michael Lüth

Sphagnum palustre L.

Habitats: fens (forested and poor to rich sedge)


Sphagnum palustre - Photo by Bob Klips

Sphagnum papillosum Lindb.

Habitats: very poor to poor fen mire habitats

Sphagnum papillosum – Photo by © Michael Lüth

Sphagnum perichaetiale Hampe

Substrates: wet depressions in sandy substrates, low to moderate-sized hummocks

Habitats: (ruderal) often in areas recently burned, *Chamaecyparis* swamps

Sphagnum portoricense Hampe

Habitats: stream channels, shallow ponds, coniferous and hardwood swamps

Sphagnum portoricense – Photo by Kathleen Walz

Sphagnum

Section Rigida

The plants are low-growing, forming loose mats to compact cushions. The capitulum is often indistinct or sometimes concealed by upward growing branches. The colors are variable, pale green, straw-colored brownish to reddish. The stem leaves are much smaller than the branch leaves, which are tongue-shaped with a broadened at base giving them a rather triangular shape, with an entire margin. The branches are strongly differentiated, with the spreading branches much stronger than pendent branches. The fascicles contain 2 - 3 spreading branches and 2 sometimes 3 pendent branches. The branches are commonly green, though they can range from green to brownish. The branch leaves egg-shaped to long egg-shaped with a broadly, rather short tips which are smooth and toothed, and fine sharp teeth on the margins.

Species

Sphagnum strictum Sull.

Rarity: S1

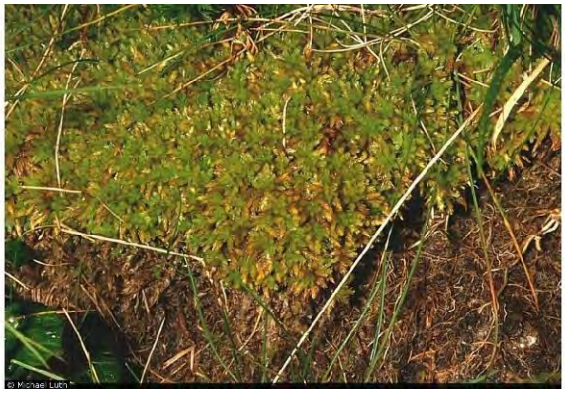
Substrates: peaty sand among grasses

Habitats: (pioneer species) pine barrens, burned-over savannas, seeps in mountainous areas inland

Sphagnum compactum Lamarck & de Candolle

Substrates: poorly drained sand, siliceous rocks, bare peat

Habitats: ombrotrophic to weakly minerotrophic



Sphagnum compactum – Photo by © Michael Lüth

Sphagnum

Section Squarrosa

The plants in this section range in size from medium to quite large. The capitulum is quite distinct in the members of this section. The colors vary from green to yellowish-brown. The stems range from green to dark reddish brown and have egg-shaped to tongue-shaped leaves that have a broad, fringed tip and for the most part lack a distinct border along margins or at the base. The branches are differentiated with the pendent branches thinner, though similar in length, than the spreading branches. The branches are green with leaves that are spreading at right angles from the stem or sometimes just spreading. The leaves are egg-shaped, some long, others spearhead shaped. The leaf margins are entire and in rolled and smooth at the top.

Species

Sphagnum squarrosum Crome

Rarity: S1/2

Habitats: (loose carpets) wet coniferous forests, *Thuja* swamps, karrs, medium fens, and stream margins

Sphagnum squarrosum - Photo by Keith Bowman

Sphagnum teres Ångström in C. J. Hartman

Rarity: S1/2

Habitats: strongly minerotrophic, open to medium rich fens, coniferous mires, rich, weakly acidic to slightly basic mires

Sphagnum teres – Photo by © Michael Lüth

Sphagnum

Section Isocladus

The plants are coarse and robust and usually found floating or submerged, but sometimes stranded by a lowered water table. The capitulum is not distinctly apparent on members of this section, though the leaves are crowded into a tuft. The color of the plants is variable and changes whether the plants are wet or dry. When wet the plants are deep green throughout or dark reddish brown to blackish brown with yellowish branch tips becoming shiny pale green to straw colored or brown when dry. The stems are green to brownish with leaves which are much smaller than branch leaves and broadly triangular in shape. The stem leaves also have entire borders and rounded leaf tips. The branches are not differentiated in appearance. The fascicles contain 2 - 3 branches. The branch stems are green with leaves taper at both ends and can be variously elongated and narrowed and sometime may be egg or tongue-shaped. The leaf tips can be tubular due to in-rolled margins or sometimes just flat and rounded.

Species

Sphagnum macrophyllum Brid.

Rarity : S1/2

Habitats: (floating or stranded) margins of shallow lakes and ponds, constantly wet seeps

Sphagnum cribrosum Lindberg

=*Sphagnum macrophyllum* var. *floridanum*

Rarity: S1

Habitats: (floating or stranded) margins of shallow acidic lakes and ponds

Sphagnum

Section Cuspidata

The plants of members of this section are variable ranging from lax, free floating to compact terrestrial forms. The capitulum is usually distinct, though varying in colors including green, whitish, pale, yellow-green to light brownish, and rarely dark-colored. The stems are green, brown, dark brown, sometimes pink in parts. The stem leaves are triangular to tongue-shaped and tend to be smaller than branch leaves, apex apiculate, acute, broad, or erose and split, border narrow or broad at base. The branches are differentiated with the pendent branches more slender and delicate than the spreading branches. The fascicles contain 2 - 3 spreading branches and 1 - 3 pendent branches. The branches are green to pinkish with egg-shaped to lance-shaped leaves, which are usually longer than the stem leaves. The branch leaves can have entire to slightly toothed margins entire and tips which roll inward exposing a smooth lower surface.

Species

Sphagnum angustifolium (Russ.) C. Jens.

Rarity: S1

Habitats: (carpets, floating mats, low hummocks and hummock sides) ombrotrophic to rich fens, open mires, sedge fens and muskeg

Sphagnum angustifolium – Photo by © Michael Lüth

Sphagnum atlanticum R.E. Andrus

Habitats: (loose carpets in pools) weakly minerotrophic fens

Sphagnum cuspidatum Hoffm.

Habitats: (carpets) ombrotrophic to weakly minerotrophic mires

Sphagnum cuspidatum – Photo by © Michael Lüth

Sphagnum fallax (Klinggr.) Klinggr.

Habitats: (pioneer species, extensive mats) poor fen habitats, ombrotrophic mires (hummock bases)

Sphagnum fallax – Photo by © Michael Lüth

Sphagnum flexuosum Dozy & Molk.

Rarity: S1/2

Habitats: (carpets) poor to medium fens (mostly sedge-fens) and mire edge habitat

Sphagnum flexuosum – Photo by © Michael Lüth

Sphagnum isoviitae Flatb.

Habitats: (carpets) wide variety of poor to medium fen habitats of both mire edge and mire wide (not found in ombrotrophic mires)

Sphagnum majus subsp. *norvegicum* (Russ.) C. Jens. ssp. *norvegicum* Flatb.

Rarity: S1

Habitats: weakly minerotrophic habitats such as poor sedge fens, lake edges, and floating mats

Sphagnum majus subsp. *majus* (Russow) C. Jensen

Habitats: (wet carpets, on floating mats, mixed with *S. cuspidatum*) ombrotrophic to poor fen habitats

Sphagnum majus - Photo by © Michael Lüth

Sphagnum mississippiense Andrus

=Sphagnum cuspidatum

Rarity: S1

Habitats: (mats) seasonally wet depressions in coastal plain

Sphagnum pulchrum (Lindberg) Warnstorf

Habitats: (abundant, dense carpets at water level, on floating mats) poor fens and raised bogs

Sphagnum recurvum P. Beauv.

Habitats: (carpets) variety of very poor to poor fen habitats including sedge fens

Sphagnum riparium Angstr.

Rarity: S1

Habitats: (extensive carpets) weakly minerotrophic mires

Sphagnum riparium - Photo by Keith Bowman

Sphagnum tenellum (Brid.) Bory

Rarity: S1/2

Habitats: (wet depressions) variety of ombrotopic and weakly minerotrophic habitats

Sphagnum tenellum – Photo by © Michael Lüth

Sphagnum torreyanum Sull.

Habitats:

(wet, often floating carpets) weakly minerotrophic mires

Sphagnum trinitense C. Mull.

Habitats: (submerged or stranded) edge of shallow, acidic pond, lakes, and roadside ditches

Sphagnum viride Flatb.

Habitats: (widespread, wet carpets) weakly minerotrophic mires

Sphagnum

Section Subsecunda

The members of this section can be erect to prostrate, and are extremely variable. The capitulum is not often well-developed. The colors are limited in their ability to aid in identification as individuals can be green, yellowish, light brown, golden brown, reddish brown, or dark brown. The stems are green to dark brown and possess leaves which can be smaller the branch leaves, but in some species they are distinctly larger, and others which lie in between. The branch leaves range from triangular, egg-shape, to tongue-shaped and can have rounded and sometimes raged notched tips. The branches are not always distinctly differentiated, with the spreading and pendent branches very similar. The fascicles contain 1 - 3 spreading branches and sometimes are few as no pendent branches to as many as 4. The branch stems are green with oval, egg-shaped or long-egg-shaped leaves.

Species

Sphagnum carolinianum Andrus

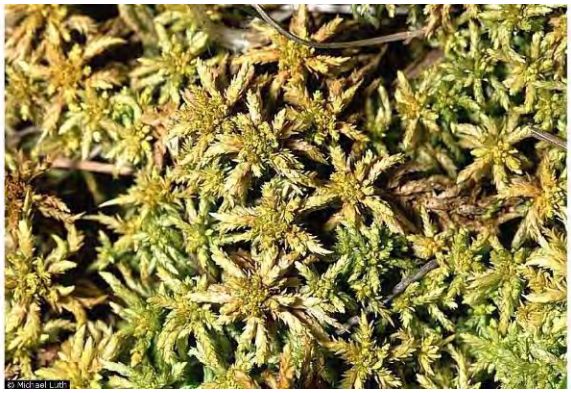
Rarity: S1/2

Habitats: (wet or floating carpets) pools in weakly minerotrophic mires

Sphagnum contortum Schultz

Rarity: S1

Habitats: (very minerotrophic) slightly basic mires (intolerant of shade)



Sphagnum contortum – Photo by © Michael Lüth

Sphagnum cyclophyllum Sullivant in A. Gray

Substrates: bare sand (subjected to submersion for a portion of the year)

Habitats: open grassy savannas, pine barrens, ditches

Sphagnum cyclophyllum – Photo by Kathleen Walz

Sphagnum lescurii Sull.

=Sphagnum subsecundum

Habitats: (weakly minerotrophic) broad range of wetlands (often aquatic or periodically dried)

Sphagnum lescurii - Photo by Bob Klips

Sphagnum platyphyllum (Braithw.) Warnst.

Rarity: S1

Habitats: (minerotrophic) shores of lakes, ponds, streams, margins of open fens, especially seasonlly flooded sites

Sphagnum platyphyllum – Photo by © Michael Lüth

Sphagnum pylaesii Brid.

Substrates: wet rock

Habitats: (weakly minerotrophic) poor fens

Sphagnum pylaesii – Photo by Kathleen Walz

Sphagnum subsecundum Nees

Rarity: S1

Habitats: (minerotrophic) edges of open, poor fens, open medium fens

Sphagnum subsecundum – Photo by © Michael Lüth

Sphagnum

Section Acutifolia

Size is variable in this section with plants ranging from small to robust. The capitulum is distinct in this section. The plants can be green, brown, pink, or red. The stems are green, red or brown with leaves which are similar in size to branch leaves. The stem leaves range in shape from triangular with a narrow tip to tongue-shaped with a narrow base and broad rounded tip. The leaf tips can be entire to lacerate and the leaf borders entire or finely fringed. The branches types are differentiated with spreading branches that are generally longer and thicker than the pendent branches. The fascicles contain 2 - 3 spreading branches and 1 - 2 pendent branches. The branch stems are green with egg-shaped leaves, which can be more or less elongate. The leaf margins entire or toothed and in-rolled near the leaf tip, which is smooth at back.

Species

Sphagnum angermanicum Melin

Habitats: Minerotrophic, hydrophytic

Sphagnum bartlettianum Warnst.

Habitats: (Ecology poorly understood) weakly minerotrophic sites such as the mires in the NJ Pine Barrens

Sphagnum capillifolium (Ehrh.) Hedw.

Rarity: S1/2

Substrates: wet, acidic rocks and peat

Habitats: (ombrotrophic, dense mats and carpets) broad range of acidic environments forested fen vegetation (infrequently)

Sphagnum capillifolium – Photo by © Michael Lüth

Sphagnum fimbriatum Wilson & Hooker in J. D. Hooker

Substrates: mineral soil

Habitats: (minerotrophic) margins of bogs and poor fens, medium open and forested fens

Sphagnum fimbriatum - Photo by Bob Klips

Sphagnum flavicomans (Card.) Warnst.

Habitats: (ombrotrophic to weakly minerotrophic and hygrophytic, hummocks) margins of ponds, poor fens (with shade), wet forests along coast (carpets)

Sphagnum fuscum (Schimp.) Klinggr.

Rarity: S1/2

Habitats: mires, hummocks, fens

Sphagnum fuscum – Photo by © Michael Lüth

Sphagnum girgensohnii Russ.

Habitats: (shade tolerant, carpets) moist forest floors, along small streams

Sphagnum girghensohnii – Photo by © Michael Lüth

Sphagnum molle Sull.

Habitats: (weakly minerotrophic and hygrophytic) poor frens and sand dunes, (tight cushions among grasses and sedges) savannas, pine barrens, swamps, pond margins, and ditches (may tolerate periodic dessication)

Sphagnum quinquefarium (Lindberg) Warnstorf

Rarity: S1

Substrates: wet mineral bedrock, damp coniferous humus

Habitats: (weakly minerotrophic and hygrophytic) coastal and montane regions

Sphagnum quinquefarium – Photo by © Michael Lüth

Sphagnum rubellum Wils.

Habitats: (carpets and hummocks) poor fens and ombrotrophic mires

Sphagnum rubellum – Photo by © Michael Lüth

Sphagnum russowii Warnst.

Rarity: S1/2

Habitats: (shade-tolerant and minerotrophic) margins of mires, open portions of poor to rich fens, wet coniferous forests

Sphagnum subfulvum Sjörs

Rarity: S1

Habitats: (hygrophytic and minerotrophic, hummock former) shrubby and wooded medium and rich fens

Sphagnum subtile (Russ.) Warnst.

Rarity : S1

Habitats: hummocks, fens, mires

Sphagnum tenerum Sullivant in A. Gray

Substrates: damp sand and thin humus

Habitats: pond margins, open savannas, and pine barrens

Sphagnum warnstorfii Russ.

Rarity : S1/2

Habitats: (hygrophytic and minerotrophic) medium to rich fens

Sphagnum warnstorfii – Photo by © Michael Lüth

Splachnaceae

Splachnum

Substrates: dung of herbivores (such as moose, cattle)
Habitats: muskeg and boggy habitats

CoC: 8
Indicator Status: OBL

New Jersey plants form soft, loose light to dark green or yellow-green tufts. The stems are 0.2-3.5 cm long and covered in rhizoids (radiculose). The stem leaves are obovate to long-lanceolate in shape with an obtuse, acute, or acuminate apex. Leaf margins are entire or toothed above. The costa extends to the leaf apex or just below. The distinct sporophyte is the obvious field character of this taxon. The seta is 0.2-6.5 cm tall and may be flexuose or twisted. The capsules have a distinct urn and hypophysis. The urns of *S. ampullaceum* are yellow-brown and the hypophyses are uellow or pink, or rarely red and top-shaped (turbinate), while the urns of *S. pensylvanicum* are orange-brown and the hypophysies are greenish, dark red or purplish and globose or narrowly pear-shaped (pyriforme).

Species

Splachnum ampullaceum Hedw.
Rarity: S1

Splachnum ampullaceum – Photo by © Michael Lüth

Splachnum pensylvanicum (Brid.) Grout
Rarity: S1

Tetraplodon

Substrates: dung of carnivores, old bones, owl pellets

CoC: 7
Indicator Status: FACW

New Jersey plants form dense tufts that are often brown below and bright green to yellow-green above. The stems are 2-8 cm tall and often matted with rhizoids below. The leaves are long-lanceolate, concave, and 3-4 mm long. Leaf margins typically have large teeth, but may occasionally be entire with a slender long acuminate apex. The costa nearly fills the leaf apex (subula). The seta is brownish and 0.2-0.4 cm tall. Capsules have an operculum, are brown becoming darker with age, ovate-cylindric in shape with the hypophysis wider than the urn and the same color or darker than the urn.

Species

Tetraplodon angustatus (Hedw.) Bruch & Schimp.

Rarity: S1

Tetraplodon angustatus – Photo by © Michael Lüth

Tetraphidaceae

Tetraphis

Substrates: well-decayed wood, stumps, and logs, sometimes on sandstone or very humic soil

CoC: 4
Indicator Status: FAC

New Jersey plants are minute and budlike or merely small, forming dense turfs or scattered patches that are green above and reddish brown below. The stems are many, 0.8-1.5 cm or rarely taller and naked below and densely foliate above. The leaves are spreading, keeled, and pellucid when moist and slightly contorted when dry. The leaves are variable in size (1-3 mm long) and shape. The lower leaves are ovate to ovate-lanceolate with the costa ending well below the apex and the upper leaves are linear and acute to acuminate with an entire margin that is broadly reflexed and the costa ending just below the apex (subpercurrent). The leaf cells are smooth. Stalked, discoid gemmae are borne in a rosette of rounded bracts formed on top of vegetative stem in both sterile and fertile material. The seta is 6-17 mm tall and straight. Capsules are narrowly cylindric in shape, 2-3 mm long, symmetric or slightly curved, and brown to reddish brown.

Species
Tetraphis pellucida Hedw.

Tetraphis pellucida - Photos by Bob Klips

Thamnobryaceae

Thamnobryum

Substrates: rock, logs, deeply shaded wet rock ledges, limestone cliffs, sandstone
Habitats: *Tsuga* hardwood forests, mixed deciduous forests

CoC: 5
Indicator Status: FACU

New Jersey plants are medium-sized to large in dull to shiny dark green to yellow-green tree-like growth forms (dendroid). The stems form a stipe that is perpendicular to the substrate with pinnate to sparsely branched in the upper stem. The secondary stem leaves are erect to erect-spreading, ovate in shape, somewhat asymmetric, and concave with a broadly acute to obtuse apex. Leaf margins are entire below and toothed (serrate) at the apex with straight teeth. The costa is single and extending just below the leaf apex (subpercurrent). The seta is 1 cm long. Capsules are cylindric in shape.

Species
Thamnobryum alleghaniense (C. Mull.) Nieuwl.

Thamnobryum alleghaniense - Photo by Keith Bowman

Theliaceae

Thelia

Substrates: sandy soil, road banks, soil over rock (granite, limestone, sandstone), base and trunk of trees, rotting logs and stumps, humus, soil, rock

CoC: 5
Indicator Status: FACU

New Jersey plants are small to medium-sized in thick glaucous, bluish green mats. The stems are once pinnate or irregularly branched with branches erect-ascending and simple or further irregularly branched. The rhizoids are reddish brown, densely branched, and forming a wooly covering on the stems. The stems and branches are swollen (tumid) to worm-shaped (julaceous). The leaves are deltoid-ovate with a broadly acute to obtuse apex that is abruptly contracted into a long apiculate acumen or hair-point (pilifer) with long-ciliate margins. The costa is single or sometimes double and extending 50% to 75% of the leaf length and it is sometimes spurred or split at the tip. Leaf cells are roughed due to papillae (1-multiple per cell). The seta is yellowish when young and turning red when mature, smooth, and flexuose when dry. Capsules are cylindric to ovoid-cylindric in shape, symmetric to somewhat curved, and smooth to weakly wrinkled when dry.

Species

Thelia asprella (Schimper) Sullivant in A. Gray

Substrates: tree trunks, rotting stumps, humus, soil at base of trees, over rock, on ground

Thelia asprella - Photo by Bob Klips

Thelia hirtella (Hedw.) Sull.

Substrates: tree trunks, rotting stumps, humus, soil, base of trees, rock

Thelia lescurii Sull.

Substrates: sandy soil, road banks, soil over rock (granite, limestone, sandstone), base of trees, rotting logs.

Thelia lescurii –Photo by Keith Bowman

Thuidiaceae

Abietinella

Substrates: dry, exposed calcareous rock and soil, sand, talus at base of cliffs, humus
Habitats: stabilized dunes, open coniferous forests

CoC: 5
Indicator Status: FACU

New Jersey plants are large and dark green, yellowish brown, or dark brown, sometimes blackish tinged. The stems may reach 12 cm long, erect-ascending and pinnately branched. The branches are short, unequal, and tapered. The stem leaves are erect when dry and erect-spreading when moist. The leaves are orange at the insertion, pleated (plicate), and 1.2-1.8 mm long. The stem leaves are ovate in shape. Leaf margins are recurved at least below and roughened (crenulate-papillose). The costa is 75% of the leaf length. Stem leaf cells are roughed with papillae on both surfaces. The branch leaves are 0.6-0.7 mm long and erect when dry and erect-spreading when moist. The branch leaves are ovate in shape with an acute to broadly acuminate apex. Leaf margins are plane and roughened (crenulate-papillose). The costa is strong and extends 75% of the leaf length. Leaf cells are roughened by papillae on both surfaces. The seta is smooth and 2-2.5 cm long. Capsules are inclined, cylindric in shape, curved (arcuate), yellow-brown, and 2-3 mm long.

Species

Abietinella abietina (Hedw.) Fleisch.

Rarity: S1

Abietinella abietina - Photos by Keith Bowman

Cyrto-hypnum

Substrates: moist woods, moist rock, limestone, sandstone, quartzite, rotten logs, base of trees

CoC: 7
Indicator Status: FACU

New Jersey plants are small. The stems are creeping and pinnately or bipinnately branched. The stem leaves are broadly triangular to broadly ovate in shape. Leaf margins are recurved at least basally and roughened (crenulate-papillose). The costa is single and extends 75% of the leaf length or to just below the leaf apex. Stem leaf cells are roughened buy 1 to many papillae on both surfaces. The branch leaves are ovate to oblong-ovate in shape with obtuse to short-acuminate apices. Leaf margins are plane and roughened (crenulate-papillose). The costa is 50% to 85% of the leaf length and covered with cells apically or not. The seta is smooth or roughened with papillae. Capsules are inclined to horizontal, cylindric in shape, and asymmetric.

Species

Cyrto-hypnum minutulum (Hedw.) Buck & Crum
Rarity: S1
Substrates: moist woods, rotten logs, rock, limestone, base of trees

Cyrto-hypnum pygmaeum (Schimp.) Buck & Crum
Rarity: S1
Substrates: moist woods, moist rock, limestone, sandstone, quartzite

Cyrto-hypnum pygmaeum - Photo by Bob Klips

Rauiella

Substrates: bark, base of hardwoods
Habitats: mature forests

CoC: 6
Indicator Status: UPL

New Jersey plants are medium-sized. The stems are 4-6 cm long, creeping, and more or less pinnately branched (2-3 mm long). The stem leaves are erect-spreading when moist. The leaves are broadly ovate to cordate-deltoid in shape with narrowly long-acuminate apices. Leaf margins are loosely revolute below and plane above. The leaf cells are roughened with papillae (3-6 per cell). Branch leaves are 0.4 mm long and ovate in shape with an acute apex. Branch leaves appressed when dry and erect-spreading when moist. The costa is whitish (pellucid) below. The leaf cells are roughened by papillae (4-6 per cell). The seta is smooth and 1-2 cm tall. Capsules are suberect to horizontal, short-cylindric in shape, and curved (arcuate).

Species

Rauiella scita (P. Beauv.) Reim.
Rarity: S1

Thuidium

Substrates: soil (calcareous, moist), humus, rock, logs, stumps, base of trees
Habitats: woodlands, swampy places, calcareous habitats, clearings

CoC: 3
Indicator Status: FAC

New Jersey plants are large. Stems are creeping to arched-ascending, 2- or 3-pinnate with abundant paraphyllia. Stem leaves are ovate in shape. Leaf margins are plane, reflexed, or revolute and roughened-toothed below and toothed above. The costa is single ending below the apex. The leaf cells are coarsely roughened with papillae. Branch leaves are ovate in shape usually with an acute apex. Leaf margins are incurved, erect, or recurved and entire to toothed (denticulate). The costa extends to just below the leaf apex. The leaf cells are roughened with papillae. The seta is smooth or rarely roughened (papillose). Capsules are inclined to horizontal, curved-cylindric in shape, and asymmetric.

Species

Thuidium delicatulum (Hedw.) Schimp.

Substrates: soil, humus, rock, logs, stumps, base of trees
Habitats: woodlands

Thuidium delicatulum - Photo by Keith Bowman

Thuidium delicatulum var. *radicans* (Kindberg) H.A. Crum et al.

=Thuidium philibertii
Rarity: S1

Substrates: (Calciphile)soil, humus, rock, logs
Habitats: swampy places

Thuidium delicatulum var. *radicans* – Photo by © Michael Lüth

Thuidium recognitum (Hedw.) Lindb.

Rarity: S1/2

Substrates: moist soil, humus, rock, logs, bark at base of trees,

Habitats: calcareous habitats, woodlands, clearings

Thuidium recognitum – Photo by © Michael Lüth

Timmiaceae

Timmia

Substrates: moist humus
Habitats: deciduous forests, shady calcareous sites, along major rivers, and disturbed sites such as lawns, golf courses or cemeteries.

CoC: 3
Indicator Status: FACU

New Jersey plants form compact or loose tufts that are brownish below and bright to yellowish green above. The stems are dark reddish black, coarsely roughened, stiff, erect, and mostly unbranched. There are usually abundant rhizoids at the base of the stems and the leaf axils. The leaves crisped to overlapping (imbricate) and occasionally inrolled when dry and erect-patent to spreading when moist. The leaves are often 2-8 mm long, lanceolate or long-lanceolate in shape with a sheathing, entire base occupying the lower 15% - 33% of the leaf, and a toothed limb. Leaf cells are smooth on the upper surface or roughened by papillae on the lower surface. The costa is single, strong, and extending to just below the leaf tip (subpercurrent) to beyond (excurrent). The seta is single or double, terminal, erect, elongate and 1.4-3.5 cm tall. Capsules are pendulous to nearly erect, ovate to oblong-cylindric in shape, and smooth. The calyptra has a median longitudinal split and is sometimes persistent on the neck of the capsule or seta.

Species

Timmia megapolitana Hedw.
Rarity: S1

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Lüth, M. 2004. *Pictures of bryophytes from Europe [CD-ROM]*. Published by the author.

Kathleen Walz contributed many photos from her personal collections.

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