A Field Guide to the Ferns of New England and Adjacent New York

by Michael Burgess

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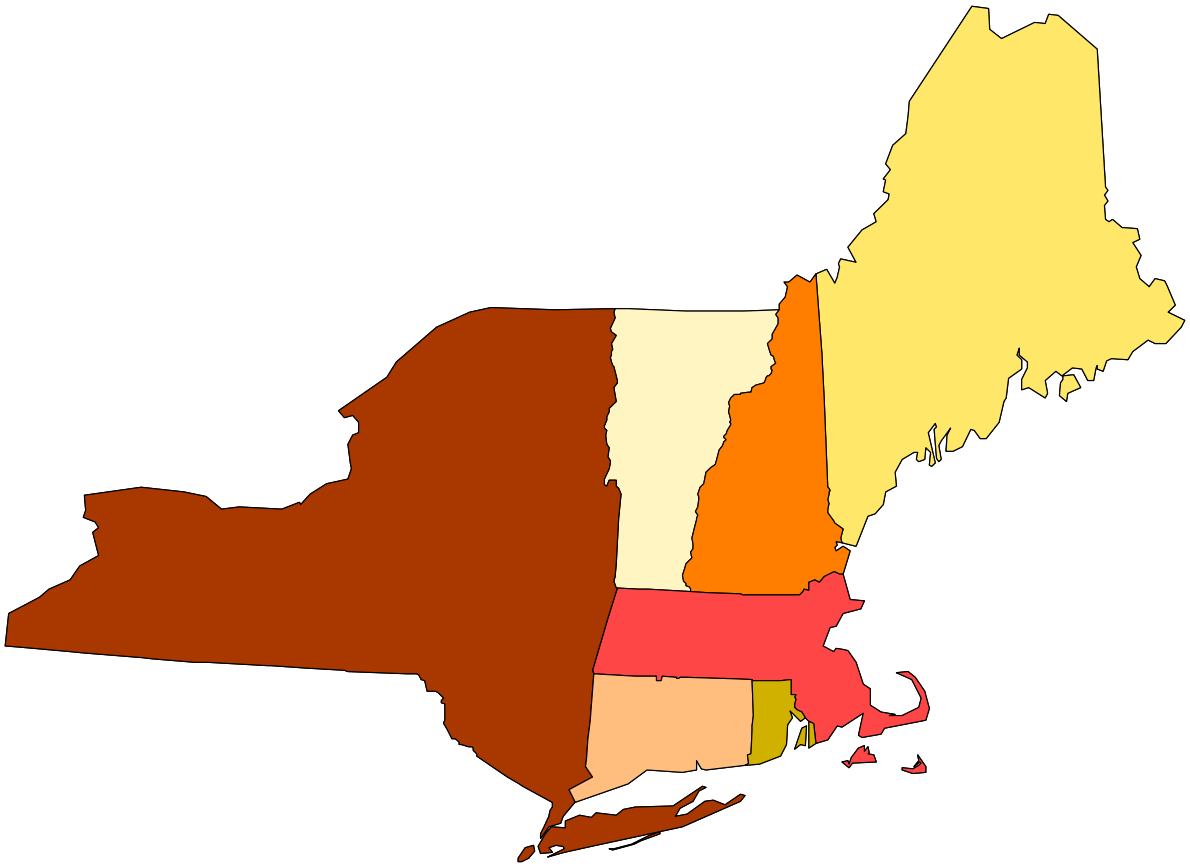
Area Of Coverage



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Lastly, I must extend a special thanks to my wife Susannah, who from the beginning of this project has always supported me with her kindness and enthusiasm. I simply could not have done it without her support!

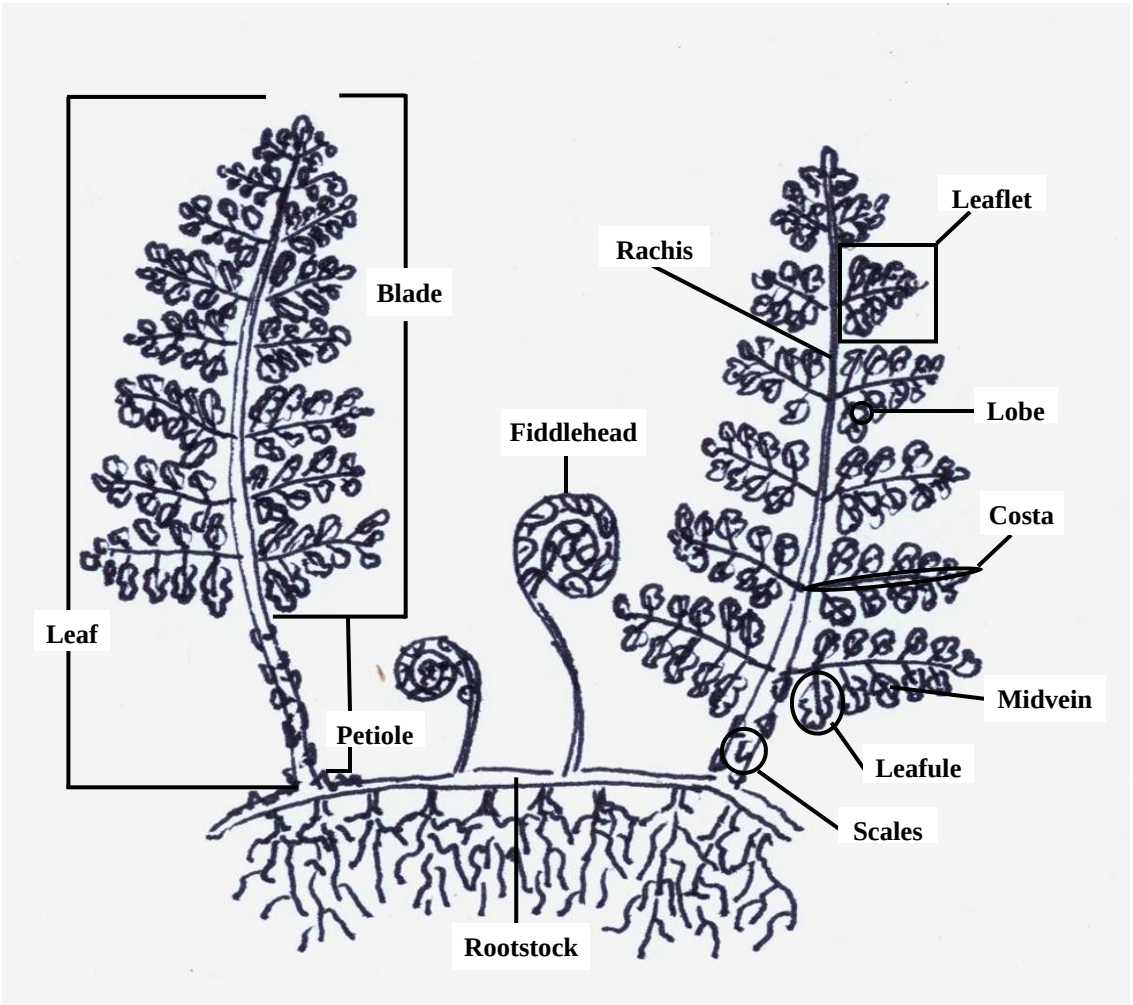
I acknowledge full responsibility for any errors or imperfections. I welcome any feedback in this regard at: michael_burgess@ antiochne.edu.

Introduction

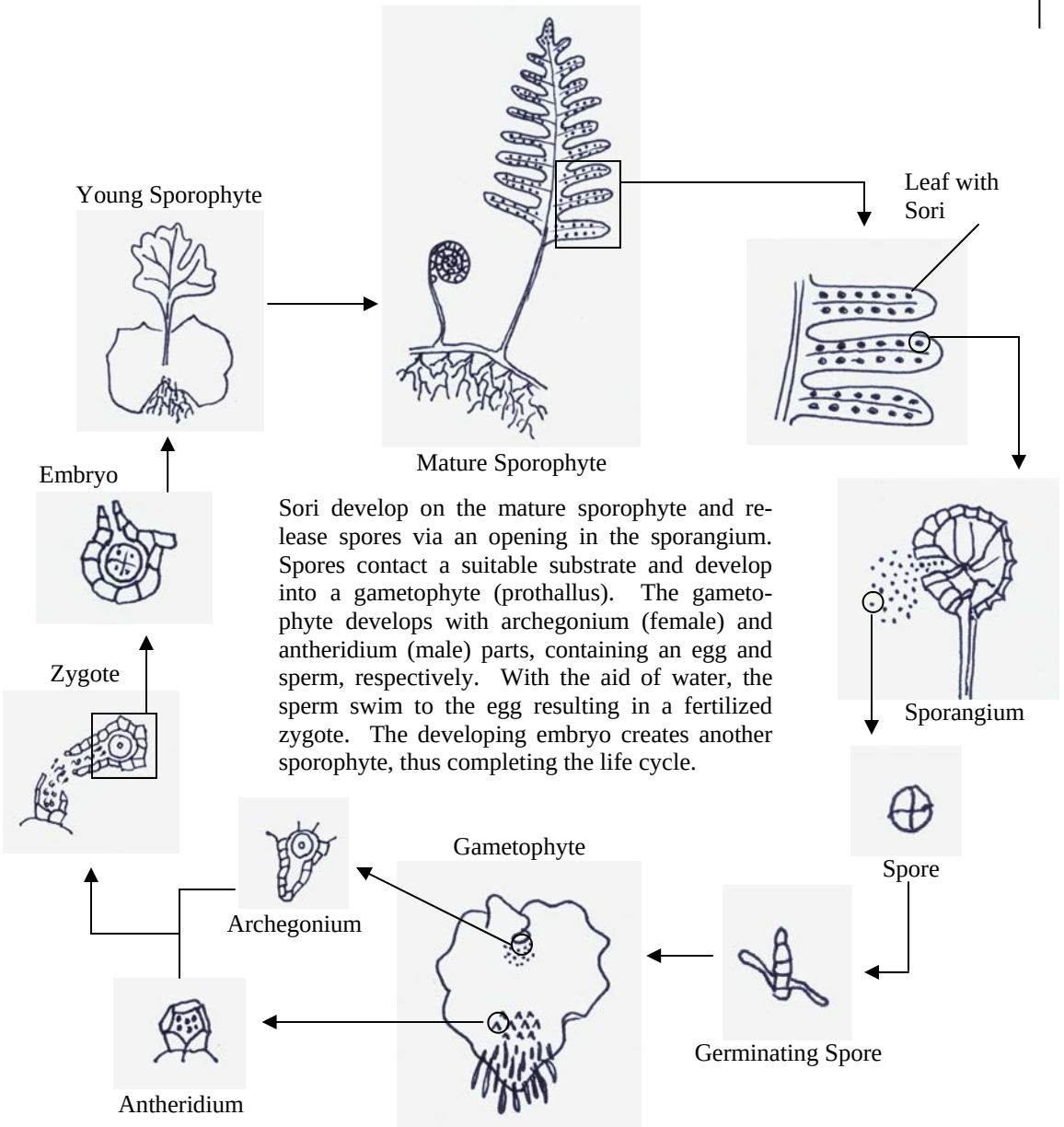
New England and adjacent New York are home to a wide array of ferns. Whether meandering about woodlands, wetlands or scurrying along rock outcroppings, one will almost always find a fern to investigate. It is the goal of this field guide to provide the user with a simple, concise, and easily accessible resource for identifying the many ferns of our area. All that is required is a basic understanding of morphological nomenclature and an eagerness to apply a careful eye to the species. Although identifying ferns can seem frustrating and perplexing at first, with time and some effort, this group of plants will provide a lifetime of exciting botanical study.

Since this guide concentrates on identification and descriptions of species, it only scratches the surface in regards to fern biology and phylogeny. There are many great resources that devote a more thorough treatment of these subjects. The place to start would be Robbin C. Moran's "A Natural History of Ferns".

Fern Morphology



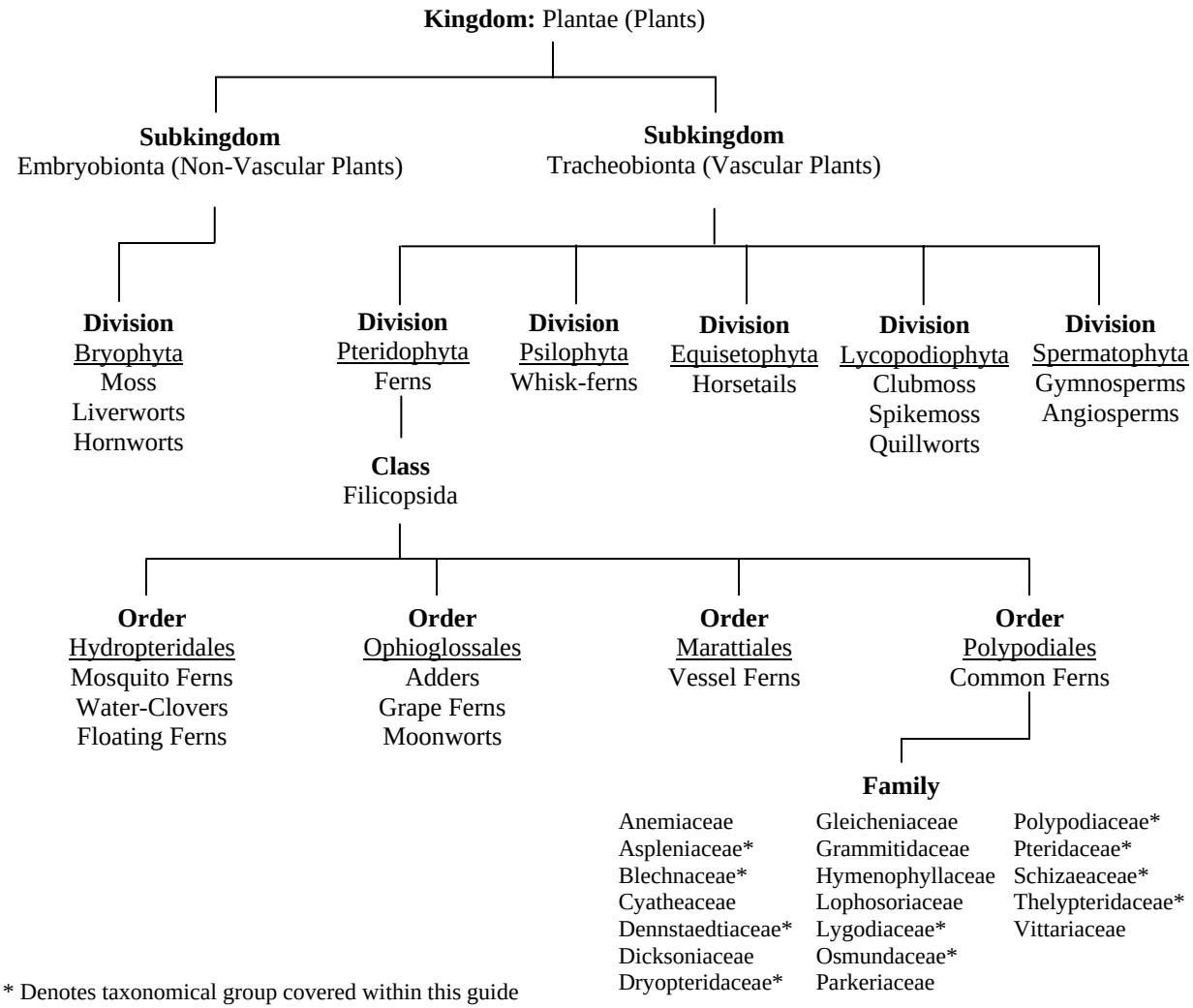
Fern Life Cycle



Sori develop on the mature sporophyte and release spores via an opening in the sporangium. Spores contact a suitable substrate and develop into a gametophyte (prothallus). The gametophyte develops with archegonium (female) and antheridium (male) parts, containing an egg and sperm, respectively. With the aid of water, the sperm swim to the egg resulting in a fertilized zygote. The developing embryo creates another sporophyte, thus completing the life cycle.

Taxonomic Classification

The following diagram depicts the current relationship of ferns with other members of the plant kingdom as described by the USDA Plant Database.



* Denotes taxonomical group covered within this guide

—ASPLENIACEAE—
Spleenwort Family

Genus: *Asplenium*
The Spleenworts

Species: *Asplenium montanum* (Mountain Spleenwort), *Asplenium platyneuron* (Ebony Spleenwort), *Asplenium rhizophyllum* (Walking Fern), *Asplenium ruta-muraria* (Wall Rue), *Asplenium scolopendrium* (Hart's Tongue Fern), *Asplenium trichomanes* (Maidenhair Spleenwort), *Asplenium trichomanes-ramosum* (Bright Green Spleenwort)

Remarks: There are approximately 700 *Asplenium* species distributed worldwide, the majority of which are found in tropical and sub-tropical regions. North America is home to 28 species. The plants of *Asplenium* are small to medium sized, delicate ferns with short creeping to erect rootstocks and wiry petioles. The spleenworts are generally monomorphic, although a few species are dimorphic. When found in the tropics the spleenworts are epiphytic and become most luxuriant in mid-elevation cloud forests; where as in temperate regions they are epipetric, often growing in crevices and cracks of limestone. Apogamy is especially common in *Asplenium*.

—BLECHNACEAE—
Chain Fern Family

Genus: *Woodwardia*
The Chain Ferns

Species: *Woodwardia areolata* (Netted Chain Fern), *Woodwardia virginica* (Virginia Chain Fern)

Remarks: *Woodwardia* consists of 14 species occurring in northern temperate zones, Central America, Mediterranean Europe, and East Asia. There are 3 species found in North America. *Woodwardia* species are medium to large, monomorphic and dimorphic ferns of terrestrial habitats. A unique characteristic is the netted veins found along the costae and midveins.

—DENNSTAEDTIACEAE—

Bracken Fern Family

Genus: *Dennstaedtia*

Hayscented Fern

Species: *Dennstaedtia punctilobula* (Eastern Hayscented Fern)

Remarks: There are 70 species of *Dennstaedtia* occurring worldwide, found mostly in the tropics. There are 3 species found in North America. *Dennstaedtia* species are medium sized, monomorphic terrestrial ferns, which often form dense colonies throughout our woodlands, sometimes leading to the suppression of other herbaceous and woody growth.

Genus: *Pteridium*

The Bracken Ferns

Species: *Pteridium aquilinum* (Western Bracken Fern)

Remarks: There is only one species commonly occurring throughout the world—it is a true cosmopolitan species. *P. aquilinum* is a monomorphic, terrestrial fern, which often forms dense colonies, sometimes leading to the suppression of other herbaceous growth. In some cases, *P. aquilinum* becomes so prolific that it is considered an irritating weed, since its deep rootstock resists the most ardent efforts to kill it.

—DRYOPTERIDACEAE—

Wood Fern Family

Genus: *Athyrium*

Lady Fern

Species: *Athyrium filix-femina* (Common Lady Fern)

Remarks: *Athyrium* consists of approximately 180 species worldwide, mostly found in temperate regions. There are 2 species in North America. *Athyrium* species are medium to large, monomorphic ferns generally occurring in terrestrial woodland habitats. They typically have short creeping rootstocks that produce clumps of leaves.

Genus: *Cystopteris*
The Bladder Ferns

Species: *Cystopteris bulbifera* (Bulblet Bladder Fern), *Cystopteris fragilis* (Brittle Bladder Fern), *Cystopteris protrusa* (Lowland Bladder Fern)

Remarks: There are 20 species of *Cystopteris* occurring throughout the temperate regions of the world, with 9 found in North America. *Cystopteris* species are delicate, monomorphic to slightly dimorphic ferns typically found in terrestrial habitats or growing as epiphytes . Species of this genus commonly hybridize rendering field identification difficult. One species, *C. bulbifera*, is unique in that it produces vegetative reproductive structures called bulblets, which can germinate to form new plants.

Genus: *Deparia*
False Spleenwort

Species: *Deparia acrostichoides* (Silver False Spleenwort)

Remarks: *Deparia* is comprised of 50 species primarily found in tropical regions of Asia, Africa, Australia and the Pacific Islands, with 2 species found in North America. *Deparia* species are medium sized, monomorphic ferns found in terrestrial habitats.

Genus: *Diplazium*
The Glade Ferns

Species: *Diplazium pycnocarpon* (Glade Fern)

Remarks: *Diplazium* consists of approximately 400 species worldwide, distributed mostly in tropical regions. There are only 3 species occurring in North America. *Diplazium* species are monomorphic ferns typically found in terrestrial or epiphytic habitats. Some species are apogamous.

Genus: *Dryopteris*
The Wood Ferns

Species: *Dryopteris campyloptera* (Mountain Wood Fern), *Dryopteris carthusiana* (Spinulose Wood Fern), *Dryopteris clintoniana* (Clinton's Wood Fern), *Dryopteris cristata* (Crested Wood Fern), *Dryopteris filix-mas* (Male Fern), *Dryopteris fragrans* (Fragrant Wood Fern), *Dryopteris goldiana* (Goldie's Wood Fern), *Dryopteris intermedia* (Intermediate Wood Fern), *Dryopteris marginalis* (Marginal Wood Fern)

Remarks: There are approximately 250 species of *Dryopteris* occurring worldwide, found mostly in the temperate regions of Asia. North America is home to 14 species. *Dryopteris* ferns exhibit broad habitat preferences, ranging from wetlands to uplands to rock outcroppings. They are monomorphic, medium to large sized, with scaly, stout petioles and variably cut blades. Some species of this genus commonly hybridize rendering field identification difficult, as some morphological characters often overlap. Apogamy is especially common in *Dryopteris*.

Genus: *Gymnocarpium*
Oak Ferns

Species: *Gymnocarpium dryopteris* (Western Oak Fern)

Remarks: *Gymnocarpium* consists of 8 species, with 5 occurring in the temperate regions of North America. *Gymnocarpium* species are monomorphic, small, delicate ferns found in shady and cool terrestrial habitats.

Genus: *Matteuccia*
Ostrich Fern

Species: *Matteuccia struthiopteris* (Ostrich Fern)

Remarks: There are 3 species of *Matteuccia* found in northern temperate regions, with only 1 species found in North America. These ferns are strongly dimorphic, with the fertile leaves persisting throughout the winter. The sterile leaves are very large and are said to resemble Ostrich feathers. As such, both the specific epithet and common name reflect this resemblance (*struthos* being Greek for ostrich). *Matteuccia* ferns are terrestrial and often found in moist to wet habitats. In addition, the young fiddleheads of *M. struthiopteris* are commonly harvested and used in various culinary dishes (see Appendix B pg. 153).

Genus: *Onoclea*
Sensitive Fern

Species: *Onoclea sensibilis* (Sensitive Fern)

Remarks: There is only 1 species for this genus, and it occurs in the temperate regions of the Northern Hemisphere and Asia. *O. sensibilis* is strongly dimorphic, with the fertile leaves persisting throughout the winter and in some cases, for a number of seasons. They are found in moist to wet habitats, commonly forming large colonies.

Genus: *Polystichum*
The Holly Ferns

Species: *Polystichum acrostichoides* (Christmas Fern), *Polystichum braunii* (Braun's Holly Fern)

Remarks: *Polystichum* is comprised of approximately 180 species occurring worldwide, with 15 found in North America. *Polystichum* species are leathery, stout ferns that are generally monomorphic, with the one exception—*P. acrostichoides*—being dimorphic. They are terrestrial ferns, mostly found growing in rocky areas. In addition, *P. acrostichoides* can occur in multiple variations, such that the margin of the leaflets are crisped, serrated, or entire.

Genus: *Woodsia*
The Cliff Ferns

Species: *Woodsia alpina* (Alpine Woodsia), *Woodsia glabella* (Smooth Woodsia), *Woodsia ilvensis* (Rusty Woodsia), *Woodsia obtusa* (Blunt Lobe Cliff Fern)

Remarks: There are approximately 30 species of *Woodsia* occurring in northern temperate regions and at high elevations throughout the tropics. There are 10 species found in North America, mostly growing on cliffs and ledges of acidic and calcareous rock types. *Woodsia* species are small, monomorphic ferns, generally covered on all parts with hairs, scales, and glands. In addition, the petioles have joints, where the fern eventually breaks off from, thus creating a stubbly appearance.

—LYGODIACEAE—
Climbing Fern Family

Genus: *Lygodium*
The Climbing Ferns

Species: *Lygodium palmatum* (American Climbing Fern)

Remarks: There are 40 *Lygodium* species occurring nearly worldwide, mostly in tropical regions, with some found in temperate zones. There are 3 species found in North America, 2 of which have escaped cultivation and the other—*L. palmatum*—being the only native species. The *Lygodium* species are a true anomaly within the fern world; they are climbing, vine-like ferns exhibiting indeterminate growth in which the rachis can reach 3-10 meters in length.

—OSMUNDACEAE—
Royal Fern Family

Genus: *Osmunda*
The Flowering Ferns

Species: *Osmunda cinnamomea* (Cinnamon Fern), *Osmunda claytoniana* (Interrupted Fern), *Osmunda regalis* (Royal Fern)

Remarks: There are 10 *Osmunda* species occurring nearly worldwide, mostly in tropical regions, with some found in temperate zones. There are 3 species found in North America, where they are concentrated in northern and eastern regions and are absent from western North America. These primitive plants are some of the largest of our native ferns. They have erect leaves that grow in a vase-like form and emanate from an ascending, mat forming rootstock. In some cases, the rootstock can stand a foot or more high, resembling the trunk of a tree fern. They are terrestrial ferns found in various, moist to wet habitats.

—POLYPODIACEAE—

Polypody Family

Genus: *Polypodium*

The Polypody Ferns

Species: *Polypodium appalachianum* (Appalachian Polypody), *Polypodium virginianum* (Rock Polypody)

Remarks: There are 100 *Polypodium* species occurring worldwide, with 11 in North America. They are small to medium sized, monomorphic ferns commonly found in clumps atop rocks and occasionally in soil. In periods of drought, when leaves whither, *Polypodium* species are able to rapidly recover following exposure to moisture.

—PTERIDACEAE—

Maidenhair Fern Family

Genus: *Adiantum*

The Maidenhairs

Species: *Adiantum pedatum* (Northern Maidenhair)

Remarks: *Adiantum* consists of approximately 200 species that mostly grow in the tropical to forested temperate regions of the world. North America is home to 9 species. Maidenhairs are terrestrial and tend to prefer mesic substrates, found along shaded stream banks and seepages. The maidenhairs are small to medium sized ferns with wiry, purplish-black, glossy petioles and rachises. Their leaflets are round to oblong and are said to resemble the leaf of *Ginkgo biloba*.

Genus: *Cheilanthes*
The Lip Ferns

Species: *Cheilanthes lanosa* (Hairy Lip Fern)

Remarks: *Cheilanthes* is comprised of 150 species, mostly confined to the Western Hemisphere, with a few occurring in Europe, Asia, Africa, Australia and the Pacific Islands. There are 28 species in North America, with a majority occurring in the deserts of the southwestern United States. *Cheilanthes* species are small to medium sized, monomorphic ferns, well adapted to the heat and desiccation stresses of their southerly habitats. A unique adaptation to such stresses is the ability of many species to curl up during dry periods, appearing dead, and then revive following a rain. In addition, a number of species are so well adapted to desert life that their gametophytes do not require water for fertilization. The Lip Ferns are found growing high up on cliffs, rock ledges and in crevices, and amongst boulders. Apogamy is especially common in *Cheilanthes*.

Genus: *Cryptogramma*
The Rock Brakes

Species: *Cryptogramma stelleri* (Fragile Rock Brake)

Remarks: There are approximately 11 *Cryptogramma* species worldwide, with 4 occurring in North America, and only 1 species in South America. The ferns of *Cryptogramma* are small and dimorphic. The fertile leaves are approximately a third taller than the sterile leaves, and the margin of the leaflets are curled. *C. stelleri* is a true rock lover, growing in cool, moist rock crevices of limestone and other calcareous rock of more northerly areas. The *Cryptogramma* are one of the few fern taxa able to withstand the harsh boreal climate that stretches from Labrador, west to Alaska.

Genus: *Pellaea*
The Cliff Brakes

Species: *Pellaea atropurpurea* (Purple Cliff Brake)

Remarks: *Pellaea* includes approximately 40 species, mostly in the Western Hemisphere, with some occurring in Asia, Africa, Australia, and the Pacific Islands. There are 15 species in North America. Within the United States, the majority of *Pellaea* ferns are found in the drier regions of the Southwest. They are small to medium sized, monomorphic to partially dimorphic, epipetric ferns. The fertile leaves typically exhibit leaflets with a curled margin that cover the sporangia. Apogamy is especially common in *Pellaea*.

—SCHIZAEACEAE—

Curly Grass Family

Genus: *Schizaea*

The Curly Grass Ferns

Species: *Schizaea pusilla* (Little Curly Grass Fern)

Remarks: *Schizaea* consists of 10 species, mainly occurring in tropical regions. Only *S. pusilla* is found in North America. *Schizaea* species are strongly dimorphic, terrestrial ferns that resemble (as the common name implies) curled grass. *S. pusilla* only grows in acidic wetlands, particularly sphagnum bogs and cedar swamps. Concerning the range of this guide, it is only found in the coastal plain of New York.

—THELYEPTERIDACEAE—

Marsh Fern Family

Genus: *Phegopteris*

The Beech Ferns

Species: *Phegopteris connectilis* (Long Beech Fern), *Phegopteris hexagonoptera* (Broad Beech Fern)

Remarks: *Phegopteris* contains 3 species worldwide, occurring in northern temperate and boreal regions. The 2 species mentioned above are the only ones found in North America. *Phegopteris* ferns are monomorphic and are found in terrestrial habitats. They are unique in that the leaflets are winged to the rachis.

Genus: *Thelypteris*

The Marsh Ferns

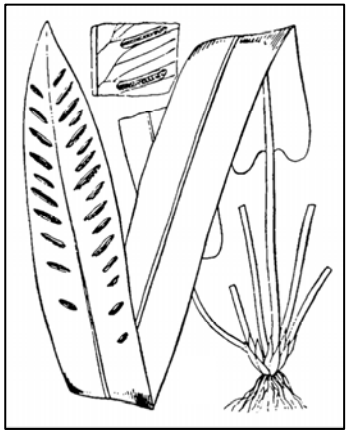
Species: *Thelypteris noveboracensis* (New York Fern), *Thelypteris palustris* (Eastern Marsh Fern), *Thelypteris simulata* (Bog Fern)

Remarks: There are approximately 900 species of *Thelypteris* occurring nearly worldwide, with 21 species found in North America. *Thelypteris* species are both monomorphic and dimorphic, terrestrial ferns tolerant of various substrate, light and moisture conditions. The above mentioned species prefer moist to wet substrates. As the species count suggests, *Thelypteris* is a very large and seemingly complex group of ferns that have a history of unsettled placement within various families, genera and sub-genera.

Key to the Species

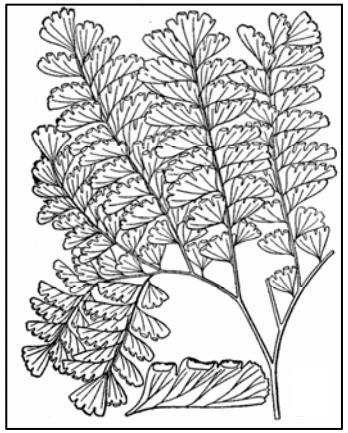
To use the key, start at #1 and continue with the instructions that follow. The key makes use of the basic morphological nomenclature introduced on pg. 6

1. Does the fern match any of the species pictured below; if yes, proceed to the corresponding page number for that fern, if no, proceed to #2 on the opposing page (pg. 19)



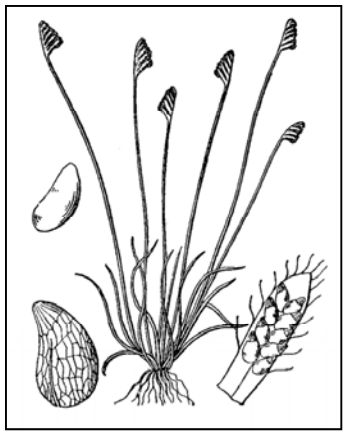
Hart's Tongue Fern
(*Asplenium scolopendrium*)
Pg. 46

American Climbing Fern
(*Lygodium palmatum*)
Pg. 90



Northern Maidenhair Fern
(*Adiantum pedatum*)
Pg. 36

Walking Fern
(*Asplenium rhizophyllum*)
Pg. 42



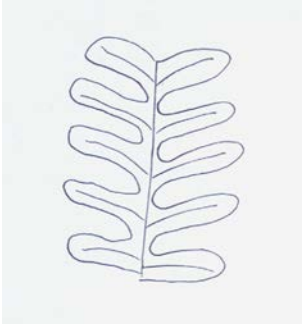
Little Curly Grass Fern
(*Schizaea pusilla*)
Pg. 118

2. Determine the cut of the leaf by using the following illustrations and definitions. Once identified, proceed to the corresponding page and continue the key by following the instructions.

Helpful Hints:
A. If needed, review the terms on pg. 6
B. Focus on the entire leaf
C. In cases where the cut varies, chose what appears to occur the majority of the time

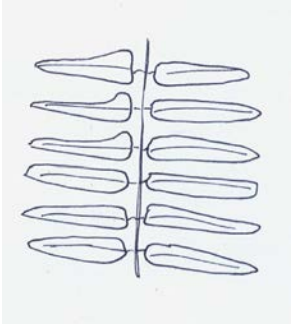
Pinnatifid: blade is deeply cut toward rachis creating primary segments that are not stemmed

Pg. 20



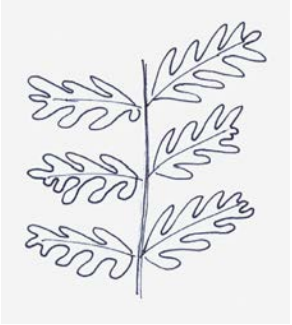
Pinnate: blade cut into leaflets that are stemmed to rachis

Pg. 22



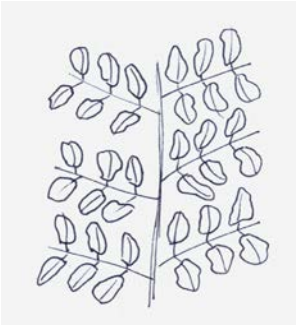
Pinnate-pinnatifid: leaflets stemmed to rachis, leaflets deeply cut into lobes; lobes not stemmed to costae

Pg. 24



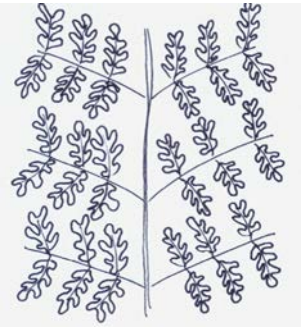
Bipinnate: leaflets stemmed to rachis; leaflets cut into leafules that are stemmed to costae

Pg. 29



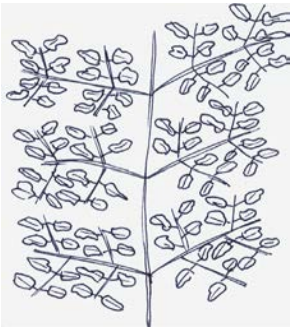
Bipinnate-pinnatifid: leaflets stemmed to rachis; leaflets cut into leafules that are stemmed to costae; leafules are deeply cut into lobes; lobes not stemmed to midveins

Pg. 32



Tripinnate: leaflets stemmed to rachis; leaflets cut into leafules that are stemmed to costae; leafules cut into leafulets that are stemmed to midveins

Pg. 34

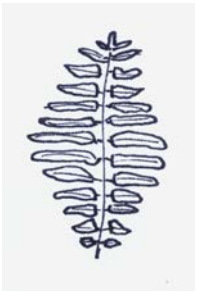


Pinnatifid

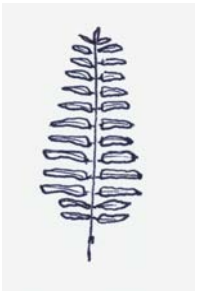
Using the table below, assign the fern a three digit number by answering the following three questions:

1. Does the “Leaf” have a “Full Taper”, “Semi Taper” or is it “Widest at Base”? (see illustrations below)
2. Does the “Petiole/Rachis” have “Scales and/or Hair” or not?
3. Does the “Petiole/Rachis” have a “Groove” or not?

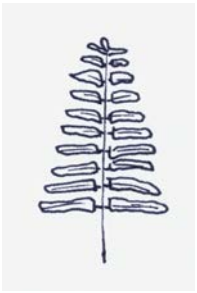
With the three digit number in mind, find it on the subsequent pages to complete the identification of the fern to species.



Full Taper



Semi Taper



Widest at Base

Leaf	Full Taper	1
	Semi Taper	2
	Widest at Base	3
Petiole/Rachis	With Scales and/or Hair	4
	Without Scales and/or Hair	5
Petiole/Rachis	With Groove	6
	Without Groove	7

246 Semi Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis with groove

Netted Chain Fern
(*Woodwardia areolata*) pg. 134

247 Semi Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Petiole base cross section with 1 vascular bundle:

Scales of rootstock both light and dark brown:

Rock Polypody
(*Polypodium virginianum*) pg. 110

Scales of rootstock uniformly golden-brown:

Appalachian Polypody
(*Polypodium appalachianum*) pg. 108

Petiole base cross section with 2 diagonal, crescent-shaped to flat vascular bundles:

Margin serrated:

Netted Chain Fern
(*Woodwardia areolata*) pg. 134

Margin not serrated:

Sensitive Fern
(*Onoclea sensibilis*) pg. 94

257 Semi Taper, Petiole/Rachis without scales and/or hair, Petiole/Rachis without groove

Scales of rootstock both light and dark brown:

Rock Polypody
(*Polypodium virginianum*) pg. 110

Scales of rootstock uniformly golden-brown:

Appalachian Polypody
(*Polypodium appalachianum*) pg. 108

347 Widest at Base, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Veins netted:

Sensitive Fern
(*Onoclea sensibilis*) pg. 94

Veins not netted:

Appalachian Polypody
(*Polypodium appalachianum*) pg. 108

357 Widest at Base, Petiole/Rachis without scales and/or hair, Petiole/Rachis without groove

Veins netted:

Sensitive Fern
(*Onoclea sensibilis*) pg. 94

Veins not netted:

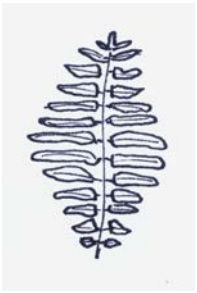
Appalachian Polypody
(*Polypodium appalachianum*) pg. 108

Pinnate

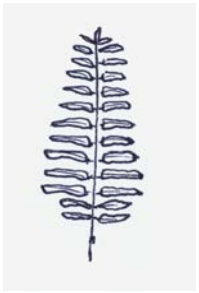
Using the table below, assign the fern a three digit number by answering the following three questions:

1. Does the “Leaf” have a “Full Taper”, “Semi Taper” or is it “Widest at Base”? (see illustrations below)
2. Does the “Petiole/Rachis” have “Scales and/or Hair” or not?
3. Does the “Petiole/Rachis” have a “Groove” or not?

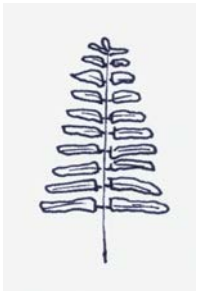
With the three digit number in mind, find it on the subsequent pages to complete the identification of the fern to species.



Full Taper



Semi Taper



Widest at Base

Leaf	Full Taper	1
	Semi Taper	2
	Widest at Base	3
Petiole/Rachis	With Scales and/or Hair	4
	Without Scales and/or Hair	5
Petiole/Rachis	With Groove	6
	Without Groove	7

147 Full Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Leaflets widest at base, tapering to point, with Christmas-stocking-like appearance:

Ebony Spleenwort
(*Asplenium platyneuron*) pg. 40

Leaflets round, blunt:

Maidenhair Spleenwort
(*Asplenium trichomanes*) pg. 48

246 Semi Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis with groove

Margin of leaflets bristly, slightly to fully serrated:

Christmas Fern
(*Polystichum acrostichoides*) pg. 112

Margin of leaflets entire:

Glade Fern
(*Diplazium pycnocarpon*) pg. 68

247 Semi Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Ferns epipetric:

Bright Green Spleenwort
(*Asplenium trichomanes-ramosum*) pg. 50

Ferns not epipetric:

Glade Fern
(*Diplazium pycnocarpon*) pg. 68

257 Semi Taper, Petiole/Rachis without scales and/or hair, Petiole/Rachis without groove

Bright Green Spleenwort
(*Asplenium trichomanes-ramosum*) pg. 50

347 Widest at Base, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Purple Cliff Brake
(*Pellaea atropurpurea*) pg. 102

357 Widest at Base, Petiole/Rachis without scales and/or hair, Petiole/Rachis without groove

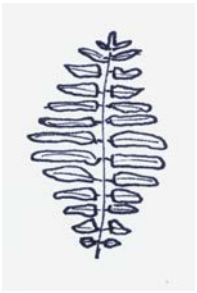
Purple Cliff Brake
(*Pellaea atropurpurea*) pg. 102

Pinnate-Pinnatifid

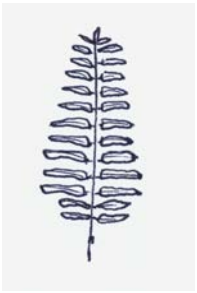
Using the table below, assign the fern a three digit number by answering the following three questions:

1. Does the “Leaf” have a “Full Taper”, “Semi Taper” or is it “Widest at Base”? (see illustrations below)
2. Does the “Petiole/Rachis” have “Scales and/or Hair” or not?
3. Does the “Petiole/Rachis” have a “Groove” or not?

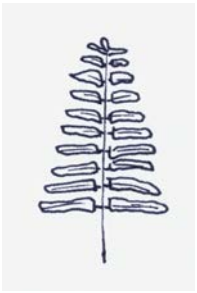
With the three digit number in mind, find it on the subsequent pages to complete the identification of the fern to species.



Full Taper



Semi Taper



Widest at Base

Leaf	Full Taper	1
	Semi Taper	2
	Widest at Base	3
Petiole/Rachis	With Scales and/or Hair	4
	Without Scales and/or Hair	5
Petiole/Rachis	With Groove	6
	Without Groove	7

146 Full Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis with groove

Veins forked:

Male Fern
(*Dryopteris filix-mas*) pg. 78

Veins not forked :

Petioles stout, with deep groove; extends from rootstock in circular, symmetrical fashion:

Ostrich Fern
(*Matteuccia struthiopteris*) pg. 92

Petioles thin, groove shallow; extends from creeping rhizome, forming asymmetrical clumps or widespread, dense colonies:

New York Fern
(*Thelypteris noveboracensis*) pg. 120

246 Semi Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis with groove

Small ferns of ledges, cliffs, and rock crevices:

Rachis and leaflets with scales and/or hair:

Very rare; found only on limestone or calcareous slate, in cool, moist crevices; leaflets rounded, lobes blunted; petiole shiny brown throughout:

Alpine Woodsia
(*Woodsia alpina*) pg. 126

Not found on limestone or calcareous rock; all parts covered with whitish or “rusty” colored hairs; petiole brown at base, turning lighter above:

Rusty Woodsia
(*Woodsia ilvensis*) pg. 130

Rachis and leaflets without scales and/or hair:

Petioles jointed:

Smooth Woodsia
(*Woodsia glabella*) pg. 128

Petioles not jointed:

Rootstock extends beyond emanating leaves:

Lowland Bladder Fern
(*Cystopteris protrusa*) pg. 62

Rootstock not extending beyond emanating leaves:

Brittle Bladder Fern
(*Cystopteris fragilis*) pg. 60

Pinnate-Pinnatifid

Ferns of woodlands and swamps:

Rootstock creeping, extending beyond emanating leaves:

Lowland Bladder Fern
(*Cystopteris protrusa*) pg. 62

Rootstock not creeping, or if so, not extending beyond emanating leaves:

Petiole base cross section with 5-7 (2-3 larger, 4-5 smaller) U-shaped vascular bundles:

Lobes of leaflets toothed with bristle tips, especially at lobe tips:

Lowest pair widest at middle, tapering toward rachis and leaflet tip; in rich, mesic soils; tip of leaf abruptly reduced, light green to yellowish:

Goldie's Wood Fern
(*Dryopteris goldiana*) pg. 82

Lowest leaflets broadly triangular, 1"+/- long; leaflets well spaced, tilted horizontal to rachis; leaf narrow:

Crested Wood Fern
(*Dryopteris cristata*) pg. 76

Lowest leaflets distinctly longer relative to width; leaflets close together; generally not fully horizontal to rachis:

Clinton's Wood Fern
(*Dryopteris clintoniana*) pg. 74

Lobes of leaflets not toothed or blunt toothed:

Marginal Wood Fern
(*Dryopteris marginalis*) pg. 86

Petiole base cross section with 2 opposing, diagonal, crescent-shaped vascular bundles:

Silver False Spleenwort
(*Deparia acrostichoides*) pg. 66

Petiole base cross section with 2 opposing, roundish vascular bundles:

Veins forked:

Eastern Marsh Fern
(*Thelypteris palustris*) pg. 122

Veins not forked:

Bog Fern
(*Thelypteris simulata*) pg. 124

Petiole base cross section with 4 vascular bundles in the shape of a square:

Virginia Chain Fern
(*Woodwardia virginica*) pg. 136

247 Semi Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Ferns epipetric:

Fragrant Wood Fern
(*Dryopteris fragrans*) pg. 80

Ferns not epipetric:

Lobes of leaflets toothed with bristle tips, especially at lobe tips:

Goldie's Wood Fern
(*Dryopteris goldiana*) pg. 82

Lobes of leaflets not toothed:

Rachis hairy:

Axil of leaflets with tuft of "cinnamon" colored woolly hair:

Cinnamon Fern
(*Osmunda cinnamomea*) pg. 96

Axil of leaflets without woolly tuft:

Interrupted Fern
(*Osmunda claytoniana*) pg. 98

Rachis without hair:

Veins forked:

Eastern Marsh Fern
(*Thelypteris palustris*) pg. 122

Veins not forked:

Bog Fern
(*Thelypteris simulata*) pg. 124

256 Semi Taper, Petiole/Rachis without scales and/or hair, Petiole/Rachis with groove

Eastern Marsh Fern
(*Thelypteris palustris*) pg. 122

346 Widest at Base, Petiole/Rachis with scales and/or hair, Petiole/Rachis with groove

Bulblet Bladder Fern
(*Cystopteris bulbifera*) pg. 58

Pinnate-Pinnatifid

347 Widest at Base, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Ferns epipetric:

Rachis flat with sparse hairs:

Mountain Spleenwort
(*Asplenium montanum*) pg. 38

Rachis not flat, smooth:

Fragile Rock Brake
(*Cryptogramma stelleri*) pg. 56

Ferns not epipetric:

Lowest pair of leaflets stemmed to rachis, all other leaflets winged to rachis:

Long Beech Fern
(*Phegopteris connectilis*) pg. 104

All leaflets winged to rachis:

Broad Beech Fern
(*Phegopteris hexagonoptera*) pg. 106

356 Widest at Base, Petiole/Rachis without scales and/or hair, Petiole/Rachis with groove

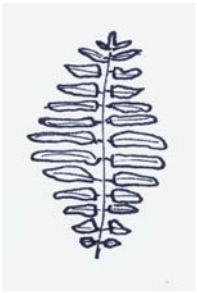
Fragile Rock Brake
(*Cryptogramma stelleri*) pg. 56

Bipinnate

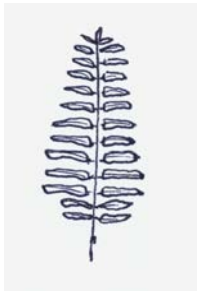
Using the table below, assign the fern a three digit number by answering the following three questions:

1. Does the “Leaf” have a “Full Taper”, “Semi Taper” or is it “Widest at Base”? (see illustrations below)
2. Does the “Petiole/Rachis” have “Scales and/or Hair” or not?
3. Does the “Petiole/Rachis” have a “Groove” or not?

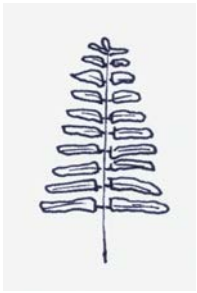
With the three digit number in mind, find it on the subsequent pages to complete the identification of the fern to species.



Full Taper



Semi Taper



Widest at Base

Leaf	Full Taper	1
	Semi Taper	2
	Widest at Base	3
Petiole/Rachis	With Scales and/or Hair	4
	Without Scales and/or Hair	5
Petiole/Rachis	With Groove	6
	Without Groove	7

Bipinnate

146 Full Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis with groove

Rachis, costa of leaflets, and leafules densely scaled and hairy:

Braun's Holly
(*Polystichum braunii*) pg. 114

Rachis, costa of leaflets, and leafules not densely scaled and hairy:

Male Fern
(*Dryopteris filix-mas*) pg. 78

147 Full Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Hairy Lip Fern
(*Cheilanthes lanosa*) pg. 54

246 Semi Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis with groove

Rachis and costa of leaflets glandular:

Blunt Lobe Cliff Fern
(*Woodsia obtusa*) pg. 132

Rachis and costa of leaflets without glands:

Petiole base cross section with 5-7 (2-3 larger, 4-5 smaller) U-shaped vascular bundles:

Marginal Wood Fern
(*Dryopteris marginalis*) pg. 86

Petiole base cross section with 2 opposing, roundish to crescent-shaped vascular bundles:

Rootstock extends beyond emanating leaves; generally found in soil of moist woodlands:

Lowland Bladder Fern
(*Cystopteris protrusa*) pg. 62

Rootstock does not extend beyond emanating leaves; generally found on rock outcroppings:

Brittle Bladder Fern
(*Cystopteris fragilis*) pg. 60

247 Semi Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Hairy Lip Fern
(*Cheilanthes lanosa*) pg. 54

257 Semi Taper, Petiole/Rachis without scales and/or hair, Petiole/Rachis without groove

Royal Fern
(*Osmunda regalis*) pg. 100

346 Widest at Base, Petiole/Rachis with scales and/or hair, Petiole/Rachis with groove

Rachis and costa of leaflets glandular; leaf with bulblets:

Bulblet Bladder Fern
(*Cystopteris bulbifera*) pg. 58

Rachis and costa of leaflets smooth; leaf without bulblets:

Wall Rue
(*Asplenium Ruta-muraria*) pg. 44

347 Widest at Base, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Rachis green:

Mountain Spleenwort
(*Asplenium montanum*) pg. 38

Rachis not green, but dark purple:

Purple Cliff Brake
(*Pellaea atropurpurea*) pg. 102

356 Widest at Base, Petiole/Rachis without scales and/or hair, Petiole/Rachis with groove

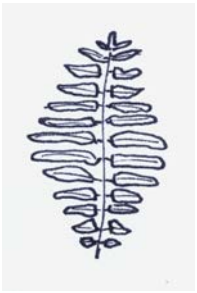
Fragile Rock Brake
(*Cryptogramma stelleri*) pg. 56

Bipinnate-Pinnatifid

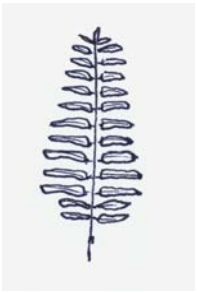
Using the table below, assign the fern a three digit number by answering the following three questions:

1. Does the “Leaf” have a “Full Taper”, “Semi Taper” or is it “Widest at Base”? (see illustrations below)
2. Does the “Petiole/Rachis” have “Scales and/or Hair” or not?
3. Does the “Petiole/Rachis” have a “Groove” or not?

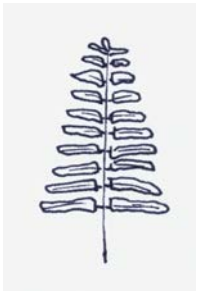
With the three digit number in mind, find it on the subsequent pages to complete the identification of the fern to species.



Full Taper



Semi Taper



Widest at Base

Leaf	Full Taper	1
	Semi Taper	2
	Widest at Base	3
Petiole/Rachis	With Scales and/or Hair	4
	Without Scales and/or Hair	5
Petiole/Rachis	With Groove	6
	Without Groove	7

147 Full Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Hairy Lip Fern
(*Cheilanthes lanosa*) pg. 54

246 Semi Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis with groove

Petiole cross section with 5-7 (2-3 larger, 4-5 smaller) U-shaped vascular bundles:

Axil and costa of leaflets glandular:

Intermediate Wood Fern
(*Dryopteris intermedia*) pg. 84

Axil and costa of leaflets without glands:

Lowest leaflets with bottom row leafules nearest rachis longer than the second and up to 2x longer than the opposing upper row leafules:

Spinulose Wood Fern
(*Dryopteris carthusiana*) pg. 72

Lowest leaflets with bottom row leafules nearest rachis dramatically longer than the second and >2x longer than the opposing upper row leafules; bottom row leafules nearest rachis distinctly offset relative to opposing upper row leafules nearest rachis; a fern of higher, cooler, moist woodlands:

Mountain Wood Fern
(*Dryopteris campyloptera*) pg. 70

Petiole base cross section with 1 continuous, smiley-faced to horizontal vascular bundle:

Eastern Hayscented Fern
(*Dennstaedtia punctilobula*) pg. 64

Petiole base cross section with 2 opposing, vertical to crescent shaped vascular bundles:

Common Lady fern
(*Athyrium filix-femina*) pg. 52

247 Semi Taper, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Hairy Lip Fern
(*Cheilanthes lanosa*) pg. 54

346 Widest at Base, Petiole/Rachis with scales and/or hair, Petiole/Rachis with groove

Leaf divided along rachis into at least three parts (1 larger, 2 smaller):

Western Bracken Fern
(*Pteridium aquilinum*) pg. 116

Leaf not divided:

Rachis and costa of leaflets glandular; with bulblets:

Bulblet Bladder Fern
(*Cystopteris bulbifera*) pg. 58

Rachis and costa of leaflets smooth; without bulblets:

Wall Rue
(*Asplenium ruta-muraria*) pg. 44

347 Widest at Base, Petiole/Rachis with scales and/or hair, Petiole/Rachis without groove

Western Oak Fern
(*Gymnocarpium dryopteris*) pg. 88

356 Widest at Base, Petiole/Rachis without scales and/or hair, Petiole/Rachis with groove

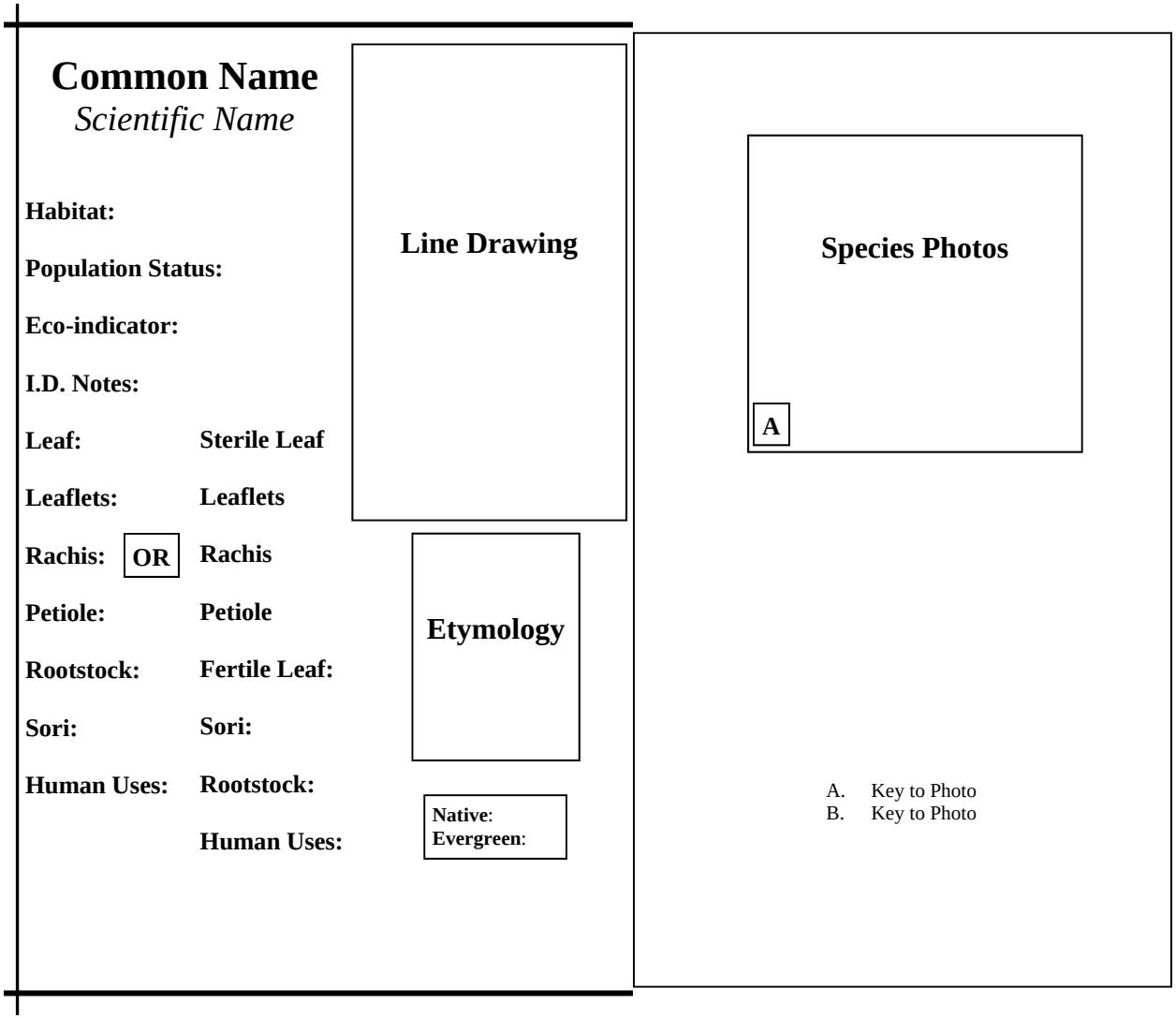
Western Bracken Fern
(*Pteridium aquilinum*) pg. 116

Tripinnate

Western Bracken Fern
(*Pteridium aquilinum*) pg. 116

Species Descriptions

Page Layouts



Northern Maidenhair Fern

Adiantum pedatum

Habitat: Found in rich, limy to circumneutral substrates of shaded woodlands, ravines, and bottoms of damp, rocky banks

Population Status: Common; reported throughout NE and NY

Eco-indicator: Rich, moist sites

I.D. Notes: A unique form; monomorphic

Leaf: Up to 2' in length; curving, branching, wiry, flat, creating a *horseshoe-like to circular appearance*; bluish-green; dainty

Leaflets: *Largest pairs nearest the central branching off point*; widest toward base, gently tapering toward tips; margin of leafules entire on one edge and shaggy on the other; leafules are conspicuously stemmed; *leafules without midvein*; veins forked

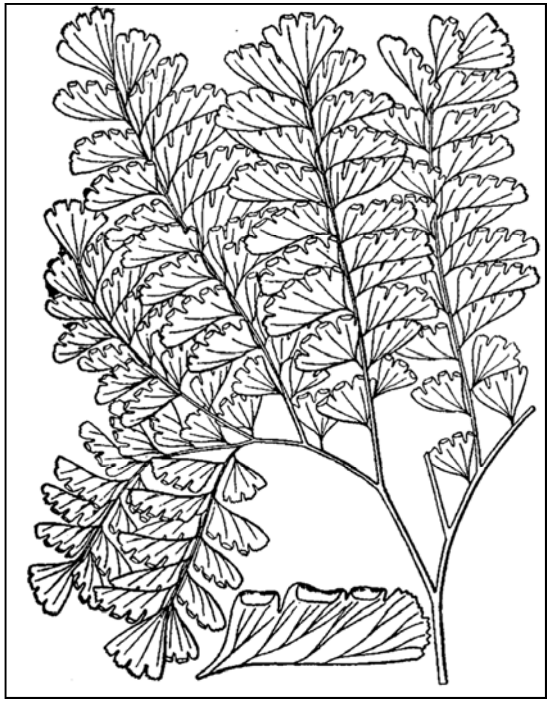
Rachis: Black to dark reddish-brown; shining; curving; smooth

Petiole: Black to dark reddish-brown; shining; scaly at base, becoming smooth above; longer than blade, round

Rootstock: Creeping, branching; scales densest at growing ends; grayish-brown; some older, dead petioles remaining

Sori: 1-5 per leafule, located on shaggy edge of margin; rectangular in shape, thin; *indusiua white to yellowish-green*

Human Uses: This plant was highly valued as a medicinal plant in the 19th century. A tea or syrup was used for treatment of nasal congestion, asthma, and sore throats. A decoction of the rootstock was massaged into rheumatic joints. Native Americans chewed the leaves and then applied them to wounds to help stop bleeding. A strong infusion of the whole plant was used as an emetic in the treatment of the flu. The petiole is used as an ornament in basketry. Well suited for moist, shade gardens.



Adiantum: (Greek) *a*—without, *diainem*—to wet; referring to the ability of leaflets to shed water

Pedatum: (Latin) *pedatus*—foot; referring to the decreasing size of the leaflets resembling a footprint

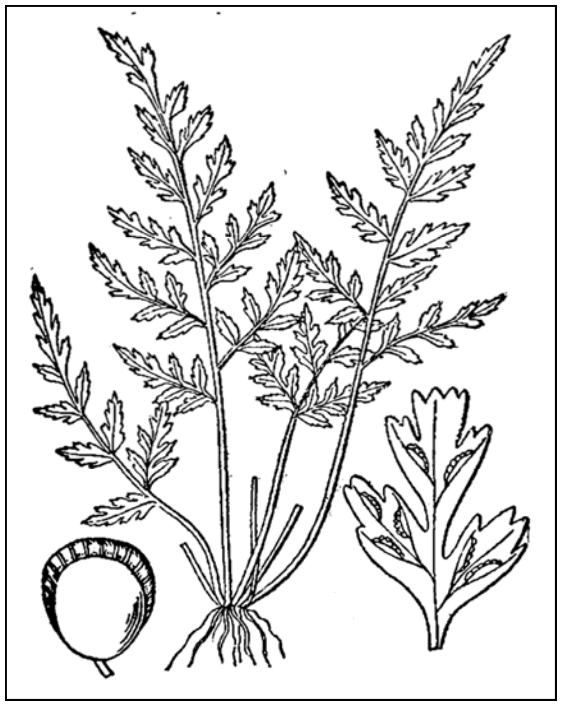
Native: Yes
Evergreen: No

Adiantum pedatum

A. Dense cluster of whole plants
B. Sterile leaf exhibiting the circular to horseshoe form of the rachis
C. Fertile leafules with sori at the margin

Mountain Spleenwort

Asplenium montanum



Habitat: Rock-lover; found in moist, shaded crevices and on ledges of sandstone, gneiss, and granite; *absent from calcareous rocks*

Population Status: *Very rare*; in southeastern NY, CT and RI, southern MA, southwestern VT; absent from NH and ME; *listed as threatened in CT and VT and endangered in RI and MA*

I.D. Notes: Pinnate-pinnatifid; widest at base; monomorphic

Leaf: Gentle taper toward tip; arching slightly; up to 8" +/- tall; grows in clumps; leathery

Leaflets: Usually 3-6 lobed, blunt; *veins can be forked or simple, never reaching margin*

Rachis: Green; *winged, flattened*; sparsely hairy

Petiole: Dark purplish-brown at base, turning green above; scaled at base, smooth above; shorter than or equal to blade

Rootstock: Short creeping;

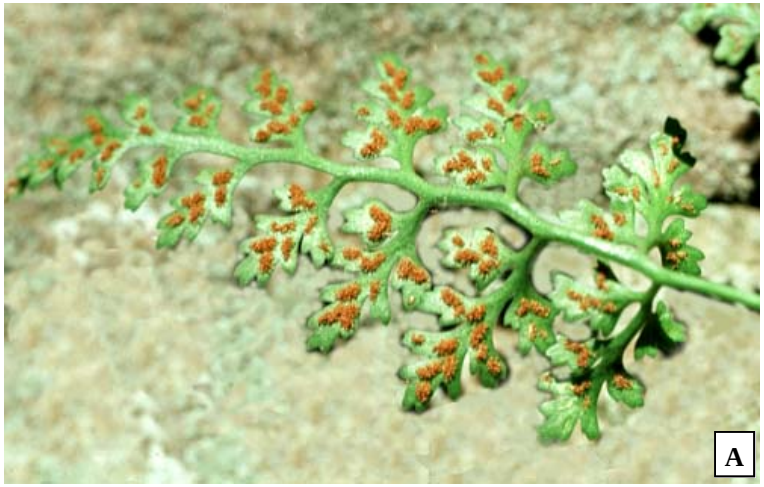
Sori: Narrow; scattered along veins of leaflets; indusia tan, slightly serrated, fragile

Human Uses: Unknown

Asplenium: (Greek) *a*—without, *splen*—spleen; referring to its supposed medicinal value for curing diseases of the spleen

Montanum: (Latin) *montanus*—growing on mountains; referring to its preferred habitat

Native: Yes
Evergreen: Yes



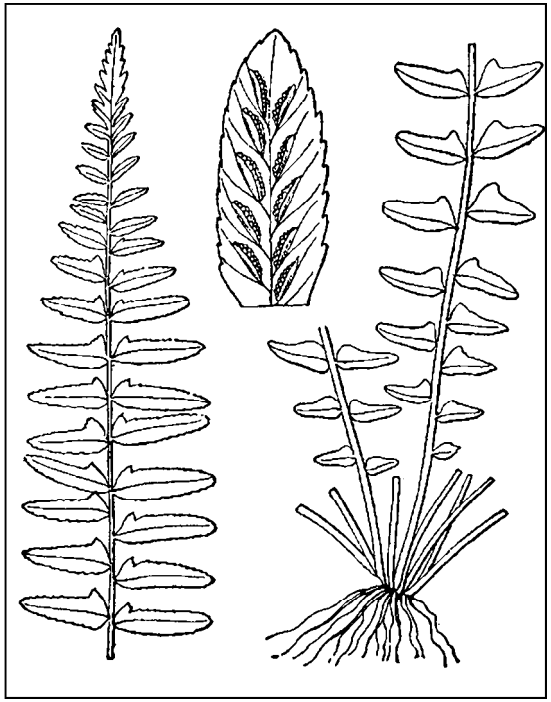
Dan Nickrent

A. Fertile leaf
B. Whole plant in rock crevice

Janet Novak

Ebony Spleenwort

Asplenium platyneuron



Habitat: Found in moist, shaded, sub-acidic woodlands, fields, along stream banks, rock fences, talus slopes, on limy outcrops and older concrete foundations; typically grouped in sets of three or four; also found as isolated individuals

Population Status: Common throughout southern areas; reported in all NE states and NY; rare in northern NH and ME; *listed as threatened in ME*

I.D. Notes: Pinnate; full taper; dimorphic

Sterile Leaf: Rarely over 6" +/- tall; leaves curling amongst each other, forming a tuft near the ground; more numerous than fertile leaves

Leaflets: Narrow, widest at base, with *Christmas-stocking-like appearance*, finely serrated; can also have variable forms that are more deeply cut; veins forked, never reaching margin

Rachis: Smooth; brown, shiny

Petiole: Smooth; short than blade, dark brown, erect

Fertile Leaf: Taller and more vertical than sterile leaf; up to 15"+/- tall, making it the tallest of all NE and NY *Aspleniums*

Sori: Positioned along veins of leaflets; aligned diagonally to costa; *indusia silvery when young, slightly toothed*

Rootstock: Clustered, upright, dark brown; sparsely scaled

Human Uses: Well suited for shaded rock gardens and for indoor plantings.

Asplenium: (Greek) *a*—without, *splen*—spleen; referring to its supposed medicinal value for curing diseases of the spleen

Platyneuron: (Greek) *platy*—broad, *neuron*—nerve of vein; referring to an early, embellished illustration of the veins

Native: Yes
Evergreen: Yes—Sterile; Semi—Fertile

Arthur Haines

A. Whole plants
B. Fertile leaflets with sori
C. Fertile leaflets with developing sori
D. Whole plant

Arthur Haines

Patrick Alexander

Walking Fern

Asplenium rhizophyllum

Habitat: *A limestone lover*; found on moist, shaded cliffs, rocks, boulders, and in crevices; generally grows in a northerly exposure

Population Status: Rare in ME; fairly common in VT, western MA and NY; *listed as endangered in NH and RI*

I.D. Notes: A unique form; monomorphic

Leaf: Up to 15" +/- tall; a single, long tapering, arching, slender blade; *greenish above with paler undersides*; leathery, shining, smooth; heart shaped to lobed at base of blade; *tips can germinate new plants*; margin variable in form—wavy to notched; *veins often netted at rachis*, becoming forked toward margin; leathery

Rachis: Green; smooth

Petiole: Dark brown at base, turning green above; scaly and grooved; flattened; much shorter than blade

Rootstock: Erect, short; with brown scales

Sori: Scattered throughout the entire underside of blade; generally angled and rectangular to curved in shape; indusia whitish, margin entire

Human Uses: Unknown

Asplenium: (Greek) *a*—without, *splen*—spleen; referring to its supposed medicinal value for curing diseases of the spleen

Rhizophyllum: (Greek) *rhiza*—root, *phyllum*—leaf; referring to the ability of leaf tips to root and produce new plants, and hence, "walk" across the land

Native: Yes
Evergreen: Yes

Asplenium rhizophyllum

A. Whole plants
B. Fertile leaf
C. Whole plants

Craig Van Boskirk

Thomas G. Barnes

Wall Rue

Asplenium ruta-muraria

Habitat: Found in partially to fully shaded, mossy crevices of limestone cliffs and talus slopes

Population Status: Uncommon in western VT, NH, MA, CT, RI and eastern NY; absent from ME; *listed as threatened in CT and MA*

I.D. Notes: Bipinnate to bipinnate-pinnatifid; full taper; monomorphic

Leaf: Up to 8" +/- tall; bluish-green; arching; dainty, airy; somewhat leathery; reminiscent of parsley

Leaflets: Distinctly stemmed; widely spaced; *leafules rounded, broad to fan-shaped*; margin facing rachis and costa entire; opposing margin cut into blunt teeth; *veins forked, never reaching margin*

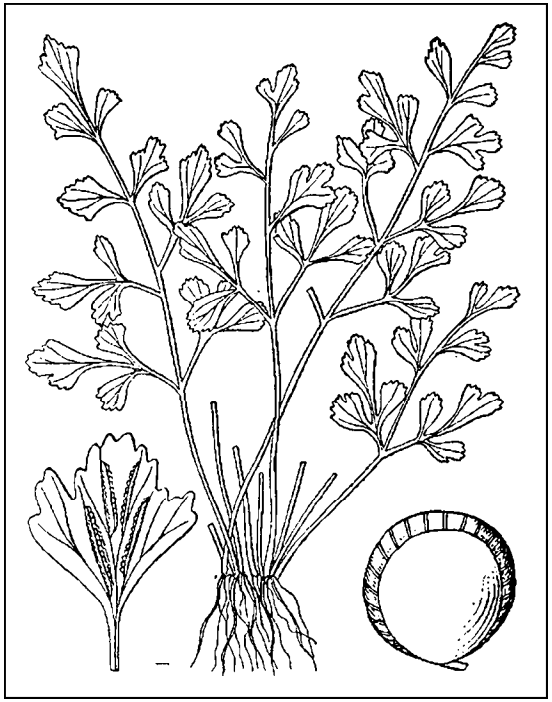
Rachis: Green; smooth, grooved; with sparse hairs

Petiole: Generally longer than blade; scaly at base, smooth above; dark brown at base, turning green above; sparsely scaled

Rootstock: Ascending to slightly creeping; many older, dead petioles remaining; scaly

Sori: Located on veins; short, rectangular in shape; often covering entire underside; indusia whitish, with hairy edges

Human Uses: Distilled water made from the leaves was used to treat many eye irritations. It was once used as a remedy for rickets and its tannin content is suitable for stopping the bleeding of small wounds.



Asplenium: (Greek) *a*—without, *splen*—spleen; referring to its supposed medicinal value for curing diseases of the spleen

Ruta-muraria: (Latin) *murus*—wall, rue of the wall; referring to its physical similarity with the plant Common Rue (*Ruta graveolons*) and its preferred habitat of castle stone walls and cathedrals of Europe

Native: Yes
Evergreen: Yes

Paul Busselen

Thomas G. Barnes

Pietro Curti

E. Horak

A. Fertile leafules with sori
B. Sterile leaf
C. Fertile leafules with sori
D. Whole plant on mossy cliff

Hart's Tongue Fern

Asplenium scolopendrium

Habitat: At higher elevations; in cool, moist, shaded limestone rock crevices and on talus slopes

Population Status: *Very Rare*; found only in western NY, where it is *listed as threatened*

I.D. Notes: A unique form; monomorphic

Leaf: Up to 18" +/- tall; *blade uniform in width*, wavy edged, arching; dark green, shining, leathery; heart shaped to lobed at base of blade; tips with blunted point; *veins forked, never reaching margin*

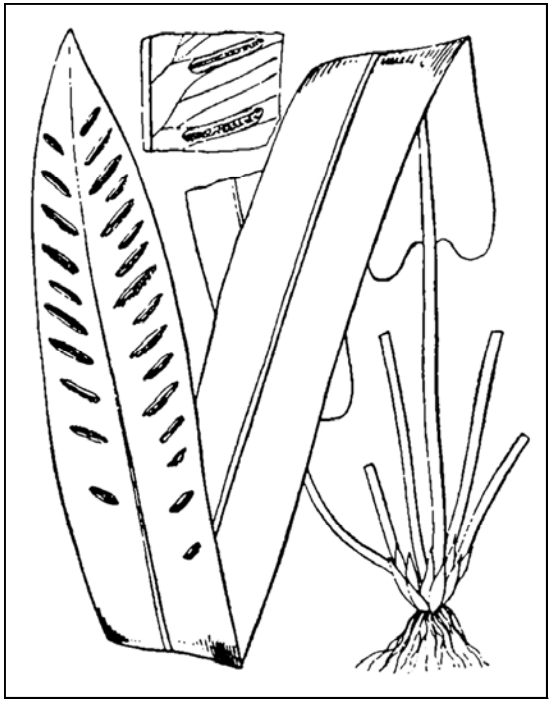
Rachis: Light brown at base, becoming yellowish above; smooth

Petiole: Light brown throughout; grooved, with brownish scales and hairs when young, becoming smoother with age; shorter than blade

Rootstock: Erect, short; some older, dead petioles remaining

Sori: Diagonal to rachis; rectangular in shape; varying in length; typically restricted to upper portions of blade; indusia present

Human Uses: An infusion of the leaves were taken internally for the treatment of diarrhea, dysentery, gravelly deposits of the bladder and for removing obstructions of the liver and spleen.



Asplenium: (Greek) *a*—without, *splen*—spleen; referring to its supposed medicinal value for curing diseases of the spleen

Scolopendrium: (Greek) *scolopendra*—centipede; referring to the parallel rows of sori that appear similar to the legs of a millipede

Native: Yes
Evergreen: Yes

Asplenium scolopendrium

A. Mrkvicka

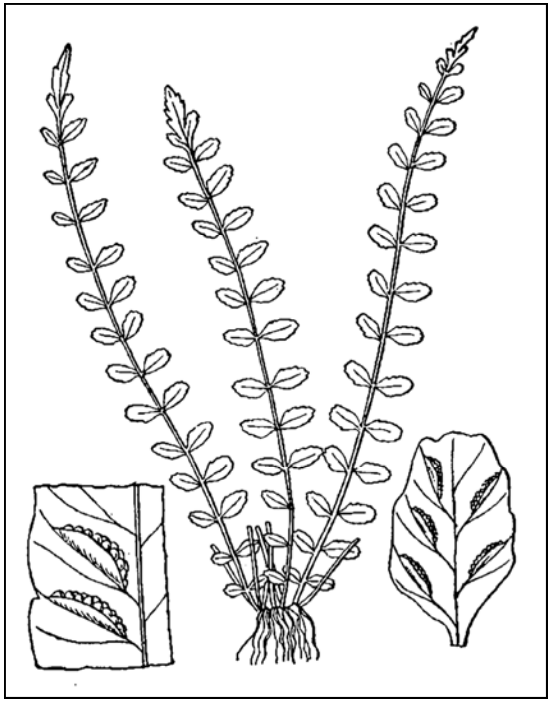
Annie Jean-Luc

A. Fertile leaf
B. Unfurling fiddleheads
C. Whole plant

Courtesy Missouri Botanical PlantFinder

Maidenhair Spleenwort

Asplenium trichomanes



Habitat: Found on moist, shaded, mossy limestone and other basic rock cliffs or atop boulders; also found on non-calcareous rocks; most frequent in the lower elevations of the Taconic Mountains of Massachusetts and the Green Mountains and Champlain Valley of Vermont.

Population Status: Common; reported throughout NE and NY; rare in northern ME

I.D. Notes: Pinnate; full taper; slightly dimorphic; can resemble *Asplenium trichomanes-ramosum*

Sterile Leaf: Up to 10"+/- tall when mature; dark green; generally growing prostrate to rock

Leaflets: *Round, blunt*; margin slightly serrated; upper leaflets crowded, becoming overlapped; generally opposite; veins forked, never reaching margin

Rachis: Smooth; *purplish-brown*

Petiole: Quite short and smooth; dark purplish-brown; brittle; much shorter than blade

Fertile Leaf: Generally more erect than sterile leaf

Sori: Positioned along veins; only a few per leaflet, decreasing in numbers toward leaf tip; indusia greenish, entire to slightly serrated

Rootstock: Clustered, upright, with dark brown scales

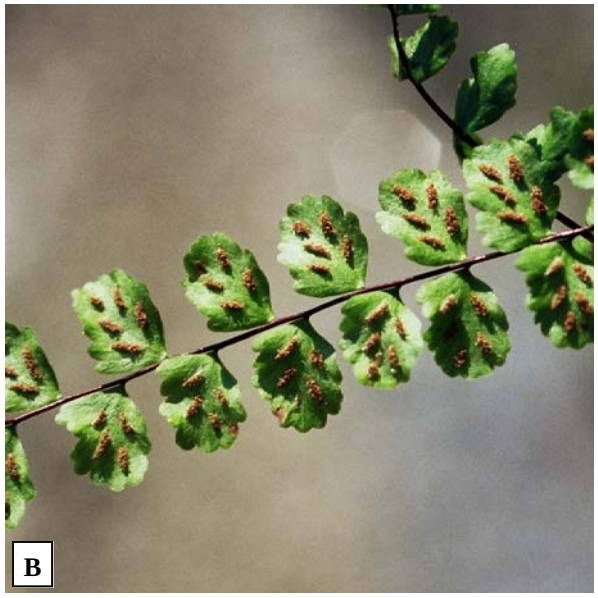
Human Uses: A tea made from leaves acts as a demulcent, expectorant and laxative. It has been used in the treatment of chest pains and to promote menstruation. Well suited for shaded rock gardens and for indoor plantings.

Asplenium: (Greek) *a*—without, *splen*—spleen; referring to its supposed medicinal value for curing diseases of the spleen

Trichomanes (Greek): a tangled mass of hair; a term used by pre-Linnaean botanists

Native: Yes
Evergreen: Yes

A. Fertile leaf
B. Fertile leaflets with sori
C. Whole plant on mossy, limestone cliff



Bright Green Spleenwort

Asplenium trichomanes-ramosum

Habitat: Shade loving; found in cool, moist crevices of limestone and on talus slopes in northerly regions

Population Status: *Very rare*; reported in only northern ME, VT and NY; *listed as threatened in ME and VT and endangered in NY*

I.D. Notes: Pinnate; semi taper; monomorphic

Leaf: 3" tall +/-; delicate, narrow; erect to semi-erect

Leaflets: Rounded, blunted at tips; slightly serrated; veins forked, never reaching margin

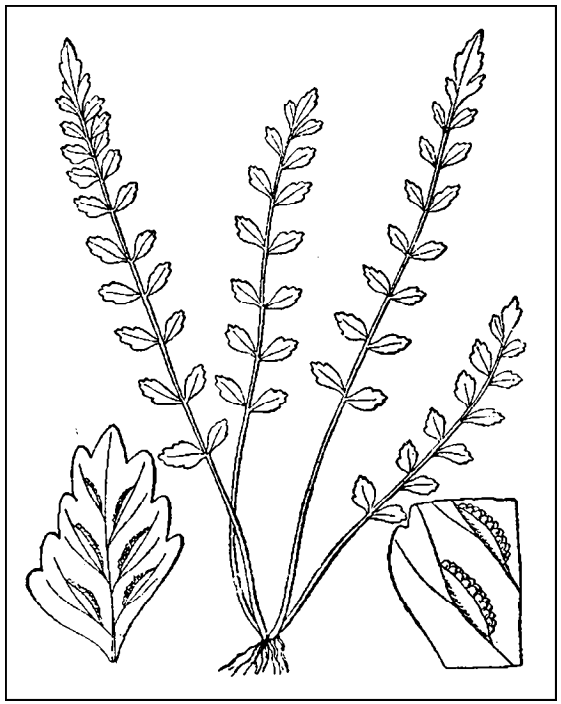
Rachis: *Green*; fragile, *flattened*

Petiole: Shorter than blade; base brown, turning green above; smooth

Rootstock: Short; slightly horizontal to erect

Sori: Positioned along veins; three to four per leaflet; indusia whitish, often deciduous

Human Uses: Unknown



Asplenium: (Greek) *a*—without, *splen*—spleen; referring to its supposed medicinal value for curing diseases of the spleen

Trichomanes (Greek): a tangled mass of hair; a term used by pre-Linnaean botanists

Ramosum: (Latin) branched

Native: Yes
Evergreen: Generally, can be deciduous

Yves Krippel & MNHN & SNL

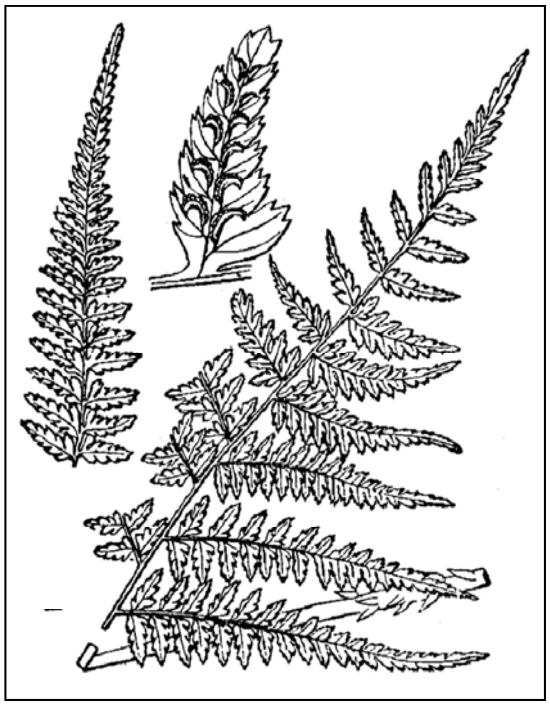
A. Mrkvicka

John Maunder

A. Whole plant
B. Fertile leaflets with developing sori
C. Whole plant on talus slope

Common Lady Fern

Athyrium filix-femina



Habitat: Found in moist, partially shaded areas of woodlands, fields, meadows, ravines, and along stone walls; FAC, equally found in wetlands and non-wetlands (34%-66% of the time)

Population Status: Common; reported throughout NE and NY

I.D. Notes: Bipinnate-pinnatifid; semi taper; monomorphic; *some species can have a red petiole*

Leaf: Up to 3' +/- tall; arching, tips sometimes wilting; varies in color—yellowish-green to lime green to dark green; tips pointed; can be variable in form

Leaflets: Generally uniform in width toward the abruptly tapering tips; tips curving and wavy, especially in sunny areas; margin of leafules serrated; leafules pointed or blunt tipped; veins forked

Rachis: Pale; slightly grooved to flat

Petiole: Base black to dark reddish-brown, turning green above—one form with red throughout; shorter than blade; scales shining, densest at base, black to dark reddish brown; *scales easily removed by fingers*; shorter than or equal to blade

Rootstock: Creeping to semi-erect; shallow to exposed; some older, dead petioles remaining

Sori: Slightly curving to horse-shoe shaped; turning dark brown during maturation; *indusia hairy, with toothed margin*

Human Uses: A tea of the boiled petioles was used to relieve labor pains. The young fiddleheads were eaten to treat internal ailments such as cancer of the womb. A tea of the boiled rootstock was used to treat general body pains, and to stop breast pains caused by childbirth. The dried powdered rootstock has been applied externally to heal sores. Well suited for moist, shaded gardens.

Athyrium: (Greek) *a*—without, *thyrus*—door; referring to indusium "door" not having pushed open by the sporangia

Filix-femina: (Latin) *filix*—fern, *femina*—female

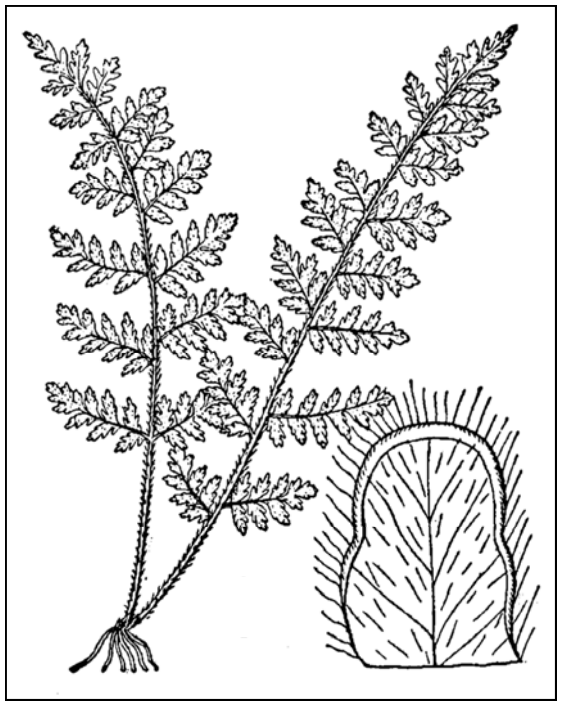
Native: Yes
Evergreen: No

A. Young leaves
B. Fertile leafules with sori
C. Unfurling fiddlehead
D. Whole plant

J.S. Peterson

Hairy Lip Fern

Cheilanthes lanosa



Habitat: Found on dry, rocky cliffs and ledges of sandstone, basalt, granite, gneiss and sometimes limestone; not reported in lowland nor higher elevations

Population Status: *Very rare*; only known stations exist in southwestern CT and southern NY—local populations can be numerous; *listed as endangered in CT and NY*

I.D. Notes: Bipinnate to bipinnate-pinnatifid; semi taper; monomorphic

Leaf: Up to 14"+/- tall, but generally smaller; narrow; leathery, coarse; clumpy growth habit

Leaflets: Becoming more closely spaced toward leaf tip; hairy above and densely hairy beneath—fuzzy appearance; hairs tan to whitish, jointed; *margin of leafules curled under, creating "hairy lip"*; costae dark reddish-brown; veins forked

Rachis: Reddish-brown; covered in white hairs that turn grayish as growing season progresses

Petiole: Blackish-purple to reddish-brown; wiry and slender; *covered with dark jointed hairs*; much shorter than blade

Rootstock: Creeping; covered with brownish-tan scales sometimes with dark, central stripe; leaves emanate in mini-tufts along rootstock

Sori: Dark brown; partially hidden by curled margin; becoming dense, forming continuous outline along margin; no indusia

Human Uses: Unknown

Cheilanthes: (Greek) *cheilos*—lip or margin, *anthos*—flower; referring to the margin of leafules curling over the sori

Lanosa: (Latin) *lana*—wool; referring to the woolly leaves

Native: Yes
Evergreen: Yes

Charles Lewallen

A. Whole plants
B. Sterile leaf
C. Fertile leaflet with sori

Fragile Rock Brake

Cryptogramma stelleri

Habitat: *Found only in northern areas or higher elevations*; deeply shaded, moist, limy substrates and in wet crevices or ledges of limestone and calcareous shale

Population Status: Rare; scattered in VT and NY; in CT, western MA, NH, and northern ME; absent in RI; *listed as threatened in ME, MA, NH and endangered in CT*

I.D. Notes: Pinnate-pinnatifid to bipinnate, widest at base; dimorphic

Sterile Leaf: Up to 8" +/- tall; delicate; variable in cut and shape; arching, low to the ground; perishing by early August

Leaflets: Variable in cut and shape; *round, blunt, fan shaped*; margin of leafules wavy to slightly lobed; partially translucent; veins 1-3 times forked

Rachis: Green; smooth

Petiole: Reddish brown at base, turning greenish above; smooth; longer than blade

Fertile Leaf: Taller; distinctly branched; leafules tapering, more narrow, blunt or pointed; *margin of leafules curled*

Sori: Located under curled margin; no indusia

Rootstock: Creeping; slender, with brown scales; slightly hairy

Human Uses: Unknown

Cryptogramma: (Greek) *kryptos*—hidden, *gramme*—line; referring to rows of sori hidden by the overlapping margin of leaflets on fertile leaves

Stelleri: (Latin) named for George Wilhelm Steller, an early Russian botanist (1709-1746)

Native: Yes
Evergreen: No

Cryptogramma stelleri

A. Developing fertile leaf
B. Fertile leaf with curled margin covering sori
C. Fertile leaf
D. Sterile leaf

John Maunder

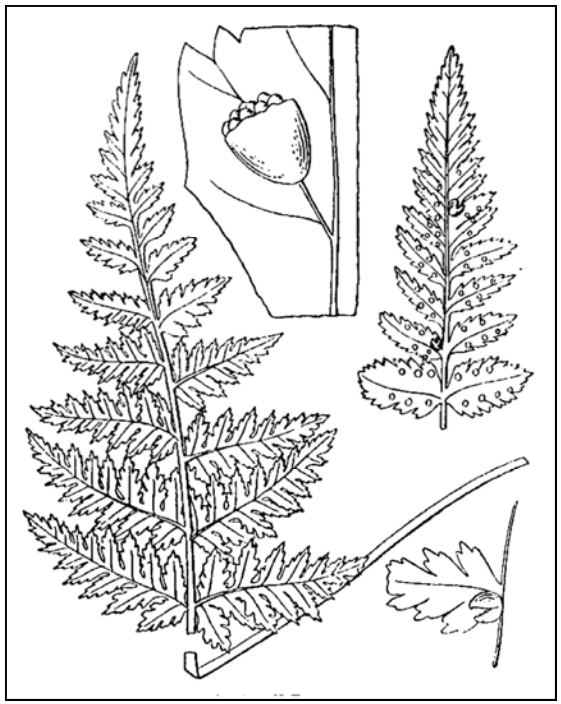
Janet Novak

Don Lubin

John Maunder

Bulblet Bladder Fern

Cystopteris bulbifera



Habitat: Found in limestone rich areas; on cliffs and steep talus slopes; prefers moist substrates, but can tolerate drier locales; occasionally found in woodlands on moist, alluvial substrates; FAC, equally found in wetlands and non-wetlands (34%-66% of the time)

Population Status: Common in VT, NH, western MA, and CT; scattered throughout ME and NY

Eco-indicator: Rich, moist to wet sites

I.D. Notes: Bipinnate to bipinnate-pinnatifid; full taper; monomorphic; can resemble *Cystopteris fragilis*

Leaf: Light green to yellowish-green, dainty; triangular; has been known to reach 5' +/- tall, but usually 1'-2' +/- tall; *distinctly long tapering*; tips sometimes curling; drooping; *produces bulblets, which can drop off and germinate new plants*

Leaflets: Lower pairs widely spaced, becoming closer toward leaf tip; generally perpendicular to rachis; costae glandular; veins forked, terminating in notches of lobes

Rachis: Shiny, yellow; delicate, thin; *glandular*

Petiole: Swollen at base; shorter than blade; dark at base, turning yellowish above; bright reddish throughout when young; sparsely scaled

Rootstock: Semi-erect, sometimes creeping; short; black with scales

Sori: Sparsely scattered, generally between margin and midvein; *indusia glandular*

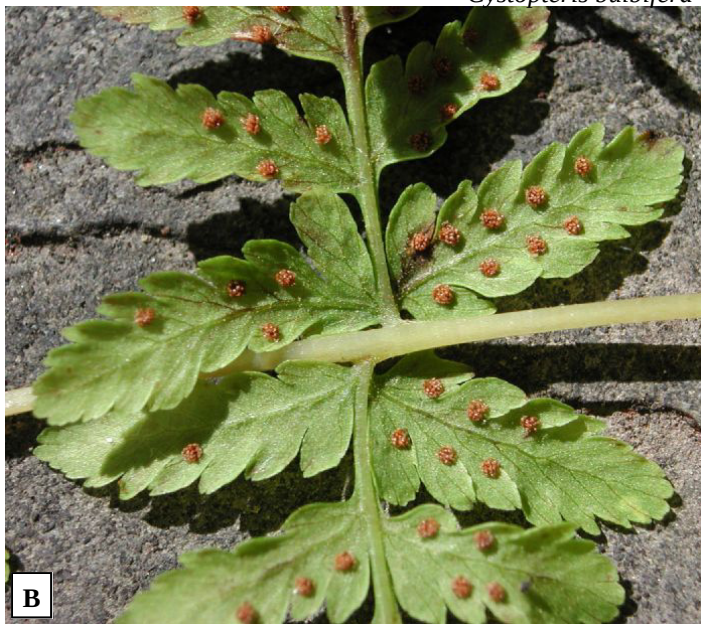
Human Uses: Unknown

Cystopteris: (Greek) *kystos*—bladder, *pteris*—fern; referring to the inflated or bladder-like indusia

Bulbifera: (Greek) *bolbos*—bulb, (Latin) *fero*—to bear; referring to the bulblet producing ability of this fern

Native: Yes
Evergreen: No

Robbin Moran



Robbin Moran

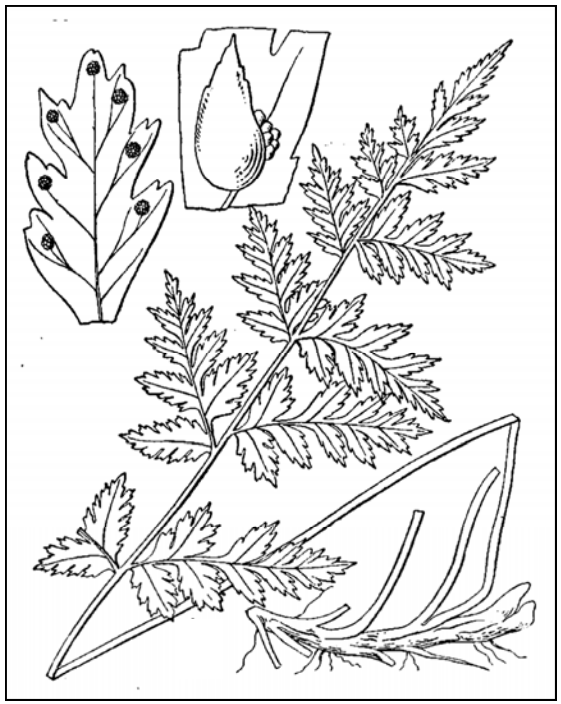
J. Liira

Brent Smith

A. Fertile leaf with bulblets
B. Fertile leafules
C. Young leaf
D. Whole plant

Brittle Bladder Fern

Cystopteris fragilis



Habitat: Found on shaded, moist cliffs, talus slops, and in crevices of various rock types; also found in rich woodlands and atop decaying tree stumps

Population Status: Fairly common; scattered throughout NE, and NY, although not found in RI

I.D. Notes: Pinnate-pinnatifid to bipinnate; semi taper; monomorphic; can resemble *Cystopteris bulbifera*

Leaf: Up to 10" +/- tall; light to dark green; arching or erect; tips pointed; light to dark green

Leaflets: Triangular; lower pairs widely spaced; cut is variable; margin entire to serrated; *veins forked, generally terminating in apex of blunt teeth*

Rachis: Smooth

Petiole: Dark brown at base, turning green to straw colored above; slender and brittle, easily injured; sparsely scaled toward base; shorter than blade

Rootstock: Creeping, branched or not; dark brown to black; covered with hairs and sparsely scaled; leaves emanate from tip

Sori: Tiny and round; scattered about; nearer the margin than midvein; *indusia roundish, tapering to a point*

Human Uses: A decoction of the rootstock was used as an anthelmintic enema. A cold infusion of the plant was used both internally and externally as a treatment for injury. Well suited for shaded rock gardens.

Cystopteris: (Greek) *kystos*—bladder, *pteris*—fern; referring to the inflated or bladder-like indusia

Fragilis: (Latin) *fragilis*—easily broken; referring to the fragile petioles that are easily broken when bent

Native: Yes
Evergreen: No

Cystopteris fragilis

Robbin Moran

Gary Fewless

Carl Farmer

A. Whole plants
B. Fertile leafule showing round sori
C. Sterile leaflets

Lowland Bladder Fern

Cystopteris protrusa

Habitat: Usually in moist soil of woodlands; also found in crevices of various rock types

Population Status: Uncommon; found only in NH, MA, CT, and NY; *listed as endangered in NY*

I.D. Notes: Bipinnate to bipinnate-pinnatifid; semi taper; slightly dimorphic

Sterile Leaf: Up to 18" +/- tall, 4" +/- wide; with pointed tips; arching to erect

Leaflets: Lowest leaflets perpendicular to rachis; cut variable; *veins forked, terminating in apex of blunt teeth of leafules*

Rachis: Smooth

Petiole: Dark brown at base, turning green to straw colored above; shorter than or equal to blade

Fertile Leaf: Taller, more erect

Sori: Tiny and round; scattered about; indusia present

Rootstock: Long creeping; *tip "protrudes" 1" +/- beyond current years growth; tip with yellowish-tan hairs and scales*

Human Uses: Unknown

V. Fulford from Ferns and Fern Allies of Canada, William J. Cody and Donald M. Britton, 1989, © Agriculture Canada

Cystopteris: (Greek) *kystos*—bladder, *pteris*—fern; referring to the inflated or bladder-like indusia

Protrusa: (Latin) *protrusus*—protruding; referring to the petiole protruding beyond the current set of leaves

Native: Yes
Evergreen: No

A. Murray Evans

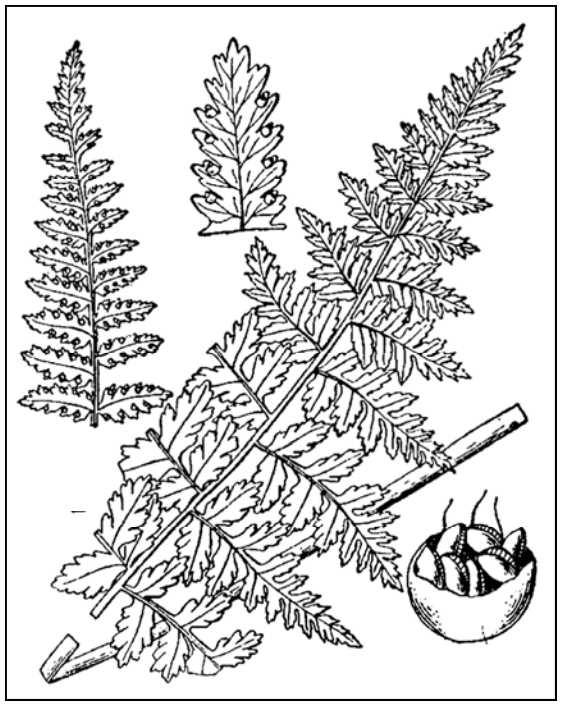
A. Fertile leaflet
B. Whole plant
C. Whole plant showing growth protruding from rootstock tip

Robbin Moran

Robbin Moran

Eastern Hayscented Fern

Dennstaedtia punctilobula



Habitat: In drier areas of partially-shaded to sunny woodlands, hillsides, roadsides, rocky slopes, rock walls and pastures; sometimes on higher elevation rocky balds and in woodland clearings

Population Status: Common; reported throughout NE and NY; can form large, solitary colonies

Eco-indicator: Moderate to poor sites

I.D. Notes: Bipinnate-pinnatifid, semi taper; monomorphic

Leaf: Up to 30" +/- tall; yellowish lime green; dainty, lacy in appearance; *crushed leaves have hay-like scent*; tips long tapered, arching, pointed

Leaflets: Wavy, tips curving; *costae covered with fine, white to golden-brown, jointed hairs*; margin of leafules serrated into blunt lobes with notched tips; veins forked

Rachis: Pale to straw-colored; slender; covered with hairs

Petiole: Dark brown to black at base, turning purplish-red brown to straw colored above; coated with fine white to golden-brown jointed hairs; slightly grooved; glandular; shorter than blade

Rootstock: Creeping and branching; slender, grows rapidly; dark brown, with reddish-brown hairs near newer growth

Sori: Small, round; located at margin, usually in the notches between two lobes; *indusia whitish, cup-like*

Human Uses: Unknown

Dennstaedtia: named for August W. Dennstaedt, a German botanist (1776-1826)

Punctilobula: (Latin) *punctum*—small spot, *lobulus*—small lobe; referring to the sori appearing as small spots on the tiny leafule lobes

Native: Yes
Evergreen: No

Dennstaedtia punctilobula

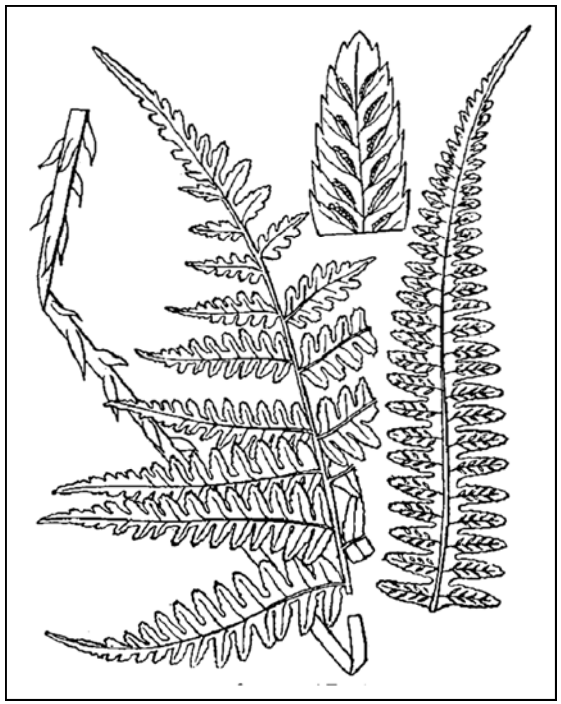
Robbin Moran

Robbin Moran

A. Densely hairy rachis
B. Fertile leaf with sori in cup-like indusium
C. Young leaf
D. Sterile leaf

Silver False Spleenwort

Deparia acrostichoides



Habitat: Found in rich, moist shaded woodlands, slopes, stream banks and along edges of swamps

Population Status: Common; reported throughout NE and NY

I.D. Notes: Pinnate-pinnatifid; semi taper; monomorphic

Leaf: Up to 3' +/- tall; widest near top; green to yellowish-green above; *hairy*

Leaflets: Narrow; *tips long, tapering to point*; lowest leaflets point downward; *grooves of costae not connected to groove on rachis*; with silvery hairs on costae; lobes rounded to flat-topped; veins simple

Rachis: Light green; *very hairy*, with few scales; grooved

Petiole: Dark and swollen at base, turning green above; stout; hairy with few scales; much shorter than blade

Rootstock: Creeping, rarely branched; covered with pale brown scales

Sori: Narrow, with slight arch; *silvery at first, turning pale brown*; positioned diagonally, located on veins; indusia attached at veins, silvery, turning light brown

Human Uses: Unknown

Deparia: (Greek) *depas*—saucer; referring to the shape of the indusium

Acrostichoides: resembling *Acrostichum* (a genus of ferns found in the tropics)—referring to its many rows of sori

Native: Yes
Evergreen: No

Robbin Moran

A. Rachis and costae of leaflets with hair
B. Blades showing long, tapering tips of leaflets
C. Fertile lobes with sori

Glade Fern

Diplazium pycnocarpon

Habitat: Sun-loving; found in open areas of moist glades, woodlands, meadows, gulches, and swamps; frequently growing in nutrient rich, circumneutral substrates; FAC, equally found in wetlands and non-wetlands (34%-66% of the time)

Population Status: Generally in secluded colonies—not widespread; reported in NY, VT, MA, CT, and RI; absent in ME and northern NH; *listed as endangered in CT and NH*

I.D. Notes: Pinnate; semi taper; slightly dimorphic

Sterile Leaf: Narrow; 36" +/- tall; *tips distinctly narrowed*, pointed, sometimes twisting or curving

Leaflets: Long, narrow; tips pointed; margin entire, prominently wavy; base flat to rounded to heart-shaped; *veins single or double forked*

Rachis: *Underside slightly hairy*; green to straw colored

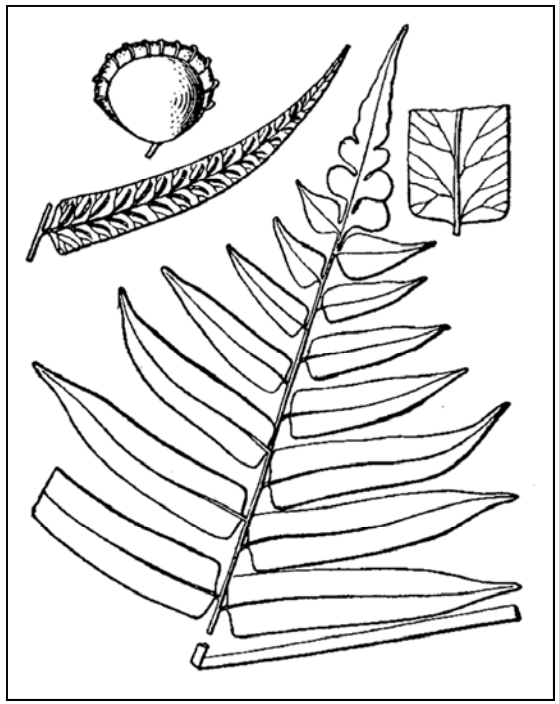
Petiole: Shorter than blade; scaly; base reddish-brown, turning green to straw-colored above; stout

Fertile Leaf: Narrower and more erect than sterile leaf; leaflets very narrow

Sori: Positioned along veins; aligned diagonally to costa; *indusia brownish, entire*

Rootstock: Creeping; slender and scaly

Human Uses: Unknown



Diplazium: (Greek) *diplazios*—double, *plasion*—oblong; referring to the parallel (double) indusium

Pycnocarpon: (Greek) *pycnos*—thick, *carpos*—fruit; referring to the crowded sori

Native: Yes
Evergreen: Yes

Diplazium pycnocarpon

Janet Novak

A. Whole plant
B. Fertile leaflets

Mountain Wood Fern

Dryopteris campyloptera

Habitat: Found in higher, cooler, more acidic locations, also found in herbaceous snow bank communities in the alpine zone

Population Status: Fairly common; reported throughout NE and NY

I.D. Notes: Bipinnate-pinnatifid, semi taper; monomorphic; can resemble *Dryopteris intermedia* and *Dryopteris carthusiana*

Leaf: Arching; *blade distinctly broad and triangular*; up to 3' +/- tall

Leaflets: *Lowest leaflets with bottom row leafules nearest rachis dramatically longer than the second and more than 2x longer than the opposing upper row leafules*; bottom row leafules nearest rachis distinctly offset relative to upper row leafules nearest rachis; margin of leafule lobes toothed and bristle tipped; veins forked

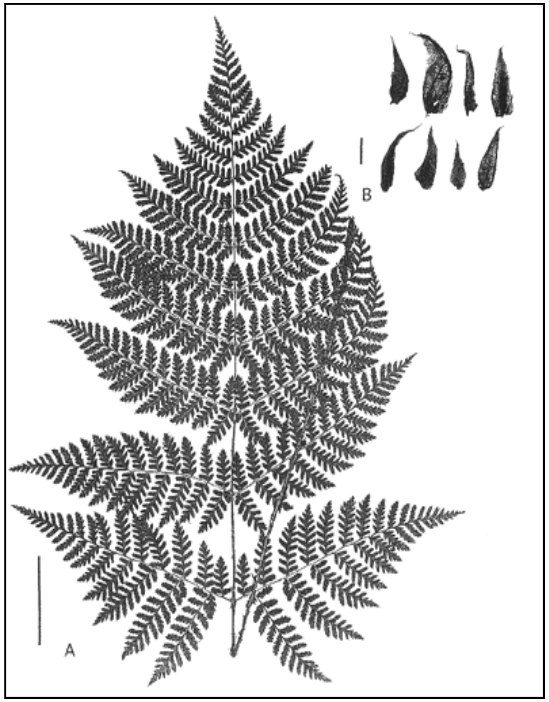
Rachis: Scaled

Petiole: Stout; shorter than leaf; scales brown, generally with darkened bases

Rootstock: Erect to slightly creeping, coarse, densely scaled

Sori: In parallel rows; positioned between margin and midvein; indusia sometimes *glandular*

Human Uses: Well suited for moist, shaded gardens.



Clarkson (Amer. Fern J. 20: 118. 1930)

Dryopteris: (Greek) *drys*—oak, *pteris*—fern; referring to the many species that are found in oak woodlands

Campyloptera: (Latin) *campylo*—curved, *ptera*—wing

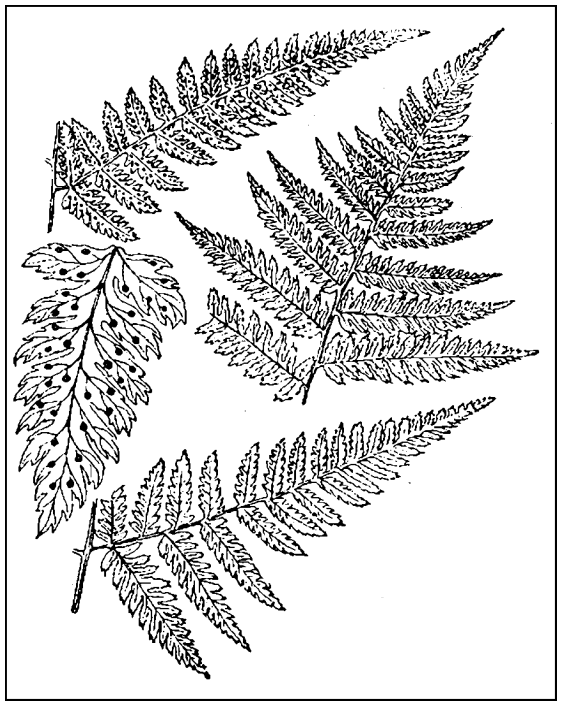
Native: Yes
Evergreen: No

John Maunder

A. Lowest leaflets—see description
B. Fertile leafules with sori
C. Whole plant showing oval shape of blade

Spinulose Wood Fern

Dryopteris carthusiana



Habitat: Found in wet, sub-acidic to acidic woodlands and swamps, can also be found in upland woodlands; FAC+, more frequently found in wetlands than non-wetlands (34%-66% of the time)

Population Status: Common; reported throughout NE and NY

I.D. notes: Bipinnate-pinnatifid, semi taper; monomorphic; can resemble *Dryopteris campyloptera* and *Dryopteris intermedia*

Leaf: Up to 30" +/- tall; width is more or less uniform from base of blade to the middle; airy and lacy in appearance

Leaflets: *Lowest leaflets with bottom row leafules nearest rachis longer than the second and up to 2x longer than the opposing upper row leafules*; margin of leafule lobes bristle tipped; lobes curving slightly toward leafule tip; veins forked

Rachis: Slightly scaled

Petiole: Stout; shorter than blade; scales pale brown, densest at base

Rootstock: Erect to slightly creeping, coarse, densely scaled

Sori: In parallel rows; positioned between margin and midvein; indusia present

Human Uses: It was one of the most effective treatments known for tapeworms. Well suited for moist, shaded gardens.

Dryopteris: (Greek) *drys*—oak, *pteris*—fern; referring to the many species that are found in oak woodlands

Carthusiana: (Latin) referring to the French village Carthusium, where specimens were collected

Native: Yes
Evergreen: Semi—fertile leaves can persist into winter; No—sterile leaves

Markkku Savela

Gary Fewless

Erv Evans

A. Lowest leaflets—see description
B. Fertile leafule with sori and showing curved lobes with bristle tips
C. Sterile leaf

Clinton's Wood Fern

Dryopteris clintoniana

Habitat: Found in wet woodlands and swamps; FACW+, usually more frequently found in wetlands (67%-99% of the time)

Population Status: Fairly common; scattered throughout NE and NY; absent from northern ME

I.D. Notes: Pinnate-pinnatifid; semi taper; slightly dimorphic; can resemble *Dryopteris cristata*

Sterile Leaf: Dark green, leathery; large—up to 3' +/- tall; arching to spreading; nearly uniform in width

Leaflets: Lowest pair distinctly longer relative to width; *costae scaly*; leaflet lobes toothed with bristle tips; veins forked

Rachis: Green to pale green; grooved; scaly, especially at base of leaflets

Petiole: Dark purplish-brown at base, turning greenish above; *scales brown, generally with darkened centers*; shorter than blade

Fertile Leaf: Taller and more erect; *lower leaflets titled horizontal to rachis, upper leaflets remain in plane of leaf*

Sori: In parallel rows; positioned between margin and midvein; *only occurring on upper leaflet*; indusia present

Rootstock: Creeping to semi-erect; black to dark brown; densely scaled

Human Uses: Well suited for moist, shaded gardens.

Dryopteris: (Greek) *drys*—oak, *pteris*—fern; referring to the many species that are found in oak woodlands

Clintoniana: named for Judge G. W. Clinton (1807-1885), an avid botanist in the area of Buffalo, NY

Native: Yes
Evergreen: Yes—sterile leaves; No—fertile leaves

Dryopteris clintoniana

Courtesy Missouri Botanical PlantFinder

Janet Novak

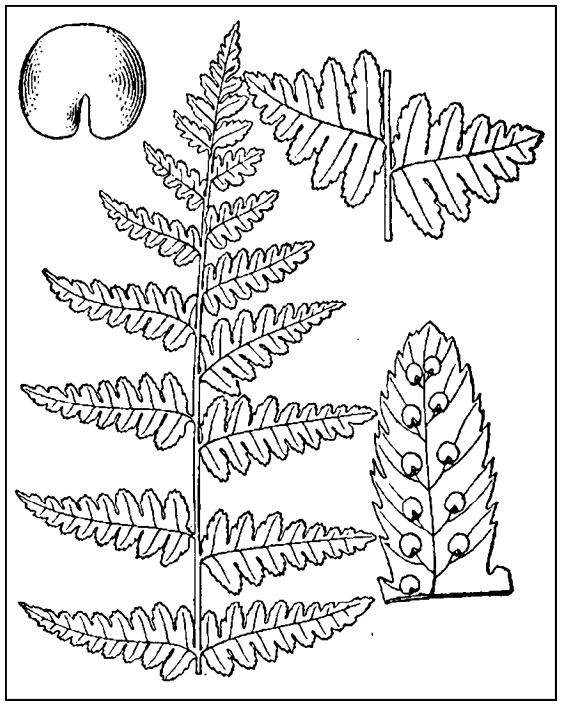
Janet Novak

A. Sterile leaf
B. Sterile leaves
C. Fertile leaflets with sori
D. Whole plant

Nichole Oullette

Crested Wood Fern

Dryopteris cristata



Habitat: Found in wet to swampy, sunny to shaded woodlands, swamps and bogs; can tolerate its roots in mud; FACW+, usually more frequently found in wetlands (67%-99% of the time)

Population Status: Common; reported throughout NE and NY

I.D. Notes: Pinnate-pinnatifid; semi taper; dimorphic; can resemble *Dryopteris clintoniana*

Sterile Leaf: *Narrow—3" to 5"* +/-; bluish-green; tips tilt backward; tapering to blunt pointed tip; spreading

Leaflets: Lowest pair broadly triangular, blunt tipped, widely spaced from those above; leaflet lobes slightly serrated, bristle tipped; veins forked

Rachis: Green; sparsely scaled

Petiole: Dark purplish-brown at base, turning green above; scales scattered throughout; shorter than blade

Fertile Leaf: Petiole much taller; leaf more erect; *leaflets distinctly tilted horizontal to rachis—ladder-like*

Sori: In parallel rows; positioned between margin and midvein; *only occurring on upper leaflet*; indusial present

Rootstock: Creeping to semi-erect; black to dark brown; very scaly

Human Uses: Unknown

Dryopteris: (Greek) *drys*—oak, *pteris*—fern; referring to the many species that are found in oak woodlands

Cristata: (Latin) *cristatus*—crested

Native: Yes
Evegreen:Yes—sterile leaves; No—fertile leaves

Janet Novak

Gary Fewless

A. Fertile leaf showing ladder-like form of blade
B. Fertile leaflet with sori
C. Lowest leaflets showing triangular form with blunt tips

Alejandra Vasco

Male Fern

Dryopteris filix-mas

Habitat: Found in northern areas in moist, rocky woodlands and slopes; typically over limestone bedrock

Population Status: Rare; reported in the mountains of ME, NH, VT and NY; absent from the rest of NE

I.D. Notes: Pinnate-pinnatifid to bipinnate; full taper; monomorphic

Leaf: Leathery; dark, deep green; up to 3' +/- tall; widest above middle

Leaflets: Long, narrow; tips pointed; costae scaled; veins forked

Rachis: Green, without groove or slightly grooved at leaf tip, scaly underneath

Petiole: Stout; with both thin, hair-like scales and broad scales, which are tan and densest at base; very short; grooved

Rootstock: Erect, thick, dark brown to black and densely scaled

Sori: In parallel rows; positioned between margin and midvein; indusia hairy; round

Human Uses: The male fern was one of the most popular and effective treatments for tape worms. The root contains an oleo-resin that paralyses tapeworms and other internal parasites. The rootstock was also taken internally for the treatment of internal hemorrhage, uterine bleeding, mumps and fevers. The ash of the plant is rich in potash and has been used in soap and glass production. The decaying leaves make a good weed suppressing mulch in the winter.

Dryopteris: (Greek) *drys*—oak, *pteris*—fern; referring to the many species that are found in oak woodlands

Filix-mas: (Latin) *filix*—fern, *mas*—male

Native: Yes
Evergreen: No

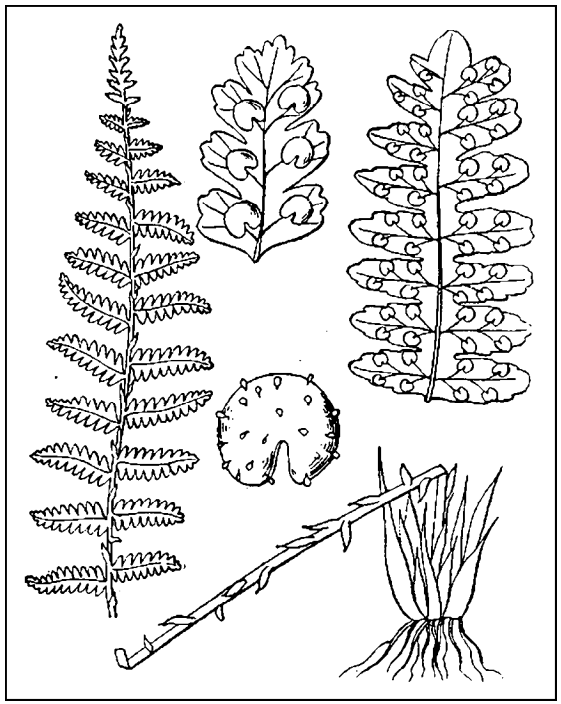
Dryopteris filix-mas

Carl Farmer

A. Whole plant
B. Fertile leaflets with sori

Fragrant Wood Fern

Dryopteris fragrans



Habitat: Rock-loving; found on acidic to basic, dry, sunny or shaded cliffs and talus slopes—typically with a northern aspect

Population Status: Rare, local; only in northern regions of VT, NH, and ME; typically found as isolated plants; *listed as threatened in NH and endangered in NY*

I.D. Notes: Pinnate-pinnatifid; semi taper; monomorphic

Leaf: Leathery in appearance; the smallest of our wood ferns—16" +/- tall; *dead, withered brown leaves mixed amongst living leaves*; narrow; *covered with glands that emit a sweet fragrance*; nearly uniform in width; erect

Leaflets: Closely spaced, sometimes overlapping; margin of lobes typically curled under—with blunt teeth; veins simple to forked

Rachis: Many broad, thin reddish-brown scales; *glandular*

Petiole: Many reddish-brown scales; broken petioles can persist, creating a stubby appearance; much shorter than blade; *sparsely glandular*

Rootstock: Erect, short; covered by brownish scales

Sori: Large relative to leaflet lobes; can cover entire under surface; dark brown; *indusia glandular*

Human Uses: Unknown

Dryopteris: (Greek) *drys*—oak, *pteris*—fern; referring to the many species that are found in oak woodlands

Fragrans: (Latin) *fragrans*—fragrant; referring to the sweet, fruity odor emitted by leaves when crushed

Native: Yes
Evergreen: Yes

Dryopteris fragrans

John Maunder

Arthur Haines

Eric Kroening

A. Young leaves
B. Sterile leaf
C. Fertile leaf

Goldie's Wood Fern

Dryopteris goldiana

Habitat: Found in rich soils of cool, moist, shaded forests; also found on well-drained, rocky slopes in northern areas; FAC+, more frequently found in wetlands than non-wetlands (34%-66% of the time)

Population Status: Common in NY and western NE montane regions; uncommon in ME; absent from RI

Eco-indicator: Rich, moist to wet sites

I.D. Notes: Pinnate-pinnatifid; semi taper; monomorphic

Leaf: Up to 4' +/- tall, making it the largest of our wood ferns; leathery; tilt backward; *tapering dramatically to tip*; green with bronze tint; young tips light green to yellowish; shaggy appearance

Leaflets: *Lowest pair widest at middle, tapering toward rachis and leaflet tip*; lower pair generally point downward; lobes slightly toothed, sometimes with bristle tips; veins forked

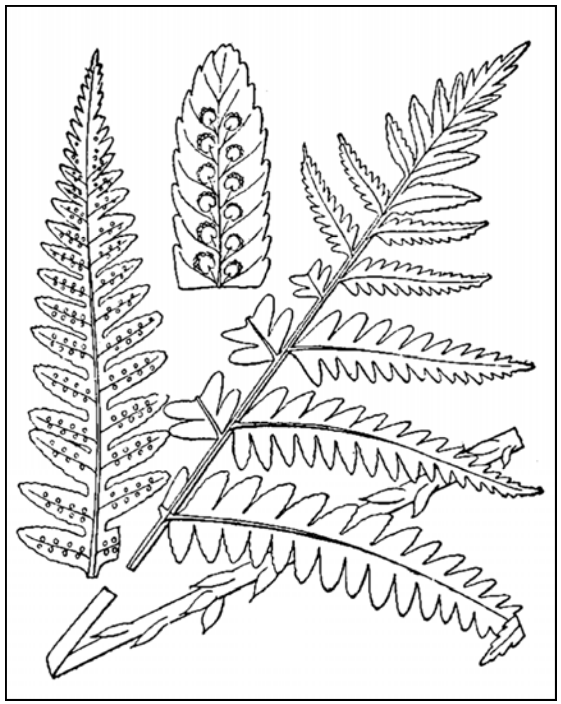
Rachis: Green with tan scales; lower portion not grooved, upper segment slightly grooved, with purplish trough

Petiole: Straw colored; *scales tan, pointy, with dark reddish-brown central stripes*; very scaly at base, lessening toward upper rachis; shorter than blade

Rootstock: Erect to semi-erect, short, densely scaled

Sori: Roundish, in parallel rows; nearer midvein; indusia present

Human Uses: Well suited for moist, shaded gardens.



Dryopteris: (Greek) *drys*—oak, *pteris*—fern; referring to the many species that are found in oak woods

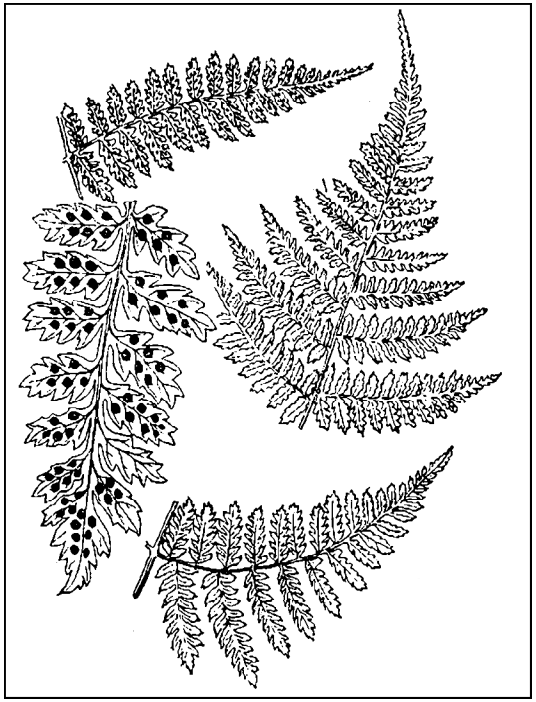
Goldiana: (Latin) named for John Goldie, a Scottish Botanist (1793-1886)

Native: Yes
Evergreen: No

A. Fertile leaflets with sori
B. Leaf tip showing abrupt taper
C. Whole plant

Intermediate Wood Fern

Dryopteris intermedia



Habitat: Found in moist to dry, circumneutral woodlands, ravines, and along rock ledges

Population Status: Common; reported throughout NE and NY

I.D. Notes: Bipinnate-pinnatifid, semi taper; monomorphic; can resemble *Dryopteris campyloptera* and *Dryopteris carthusiana*

Leaf: Up to 3' in length; blade triangular; leathery and lacy in appearance

Leaflets: *Lowest leaflets with bottom row leafules nearest rachis shorter than, or equal to the second*; *costae and axils glandular*; margin of leafules toothed and bristle tipped; veins forked

Rachis: *Whitish glandular hairs*; slightly scaled

Petiole: Stout; shorter than blade; scales brown, with darkened centers, densest at base

Rootstock: Erect to slightly creeping, coarse, densely scaled

Sori: In parallel rows; positioned between margin and midvein; *indusia glandular*

Human Uses: Well suited for moist, shaded gardens.

Dryopteris: (Greek) *drys*—oak, *pteris*—fern; referring to the many species that are found in oak woodlands

Intermedia: (Latin) *intermedius*—between or intermediate

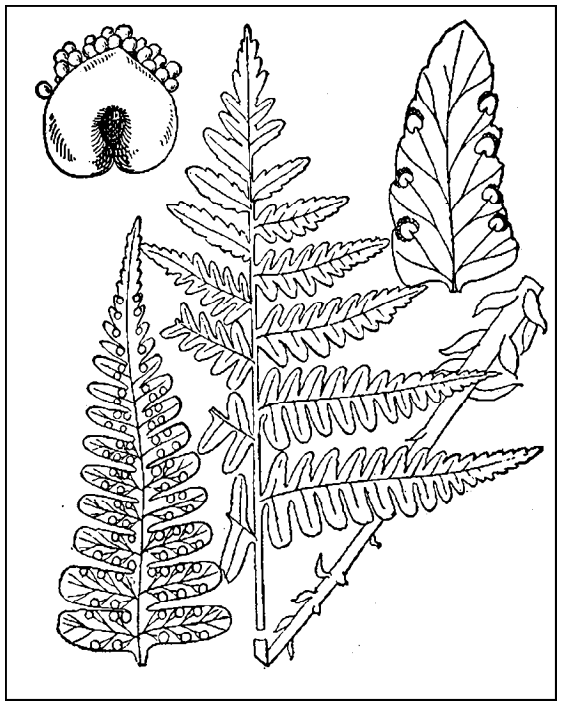
Native: Yes
Evergreen: Yes

J.S. Peterson

A. Lowest leaflets—see description
B. Sterile leaves
C. Fertile leafules with sori and showing glandular midvein

Marginal Wood Fern

Dryopteris marginalis



Habitat: *A true soil generalist*, tolerating alkaline, neutral and acidic substrates; found in a variety of semi-shaded locations, including stream banks, talus and wooded slopes, ravines, ledges, rock crevices and lowland forests

Population Status: Abundant; reported throughout NE and NY

I.D. Notes: Pinnate-pinnatifid to bipinnate; semi taper; monomorphic

Leaf: *Dark bluish-green*; up to 3' +/- tall; *leathery*; arching, tips tapering to point; some leaves of previous year withered, mat forming

Leaflets: Tapering to point; tips curving and wavy; becoming overlapped toward leaf tip; *underside distinctly lighter*, costae dark purple; margin of lobes or leafules entire or bluntly serrated; veins forked

Rachis: Pale to light green; scaly, especially toward base of leaflets; narrow groove

Petiole: *Swollen at base*; stout; base dark reddish-brown, turning brownish-green to light green above; *base covered in large, papery golden-brown scales—very dense*; shorter than blade

Rootstock: Ascending; very stout and densely covered in golden-brown scales

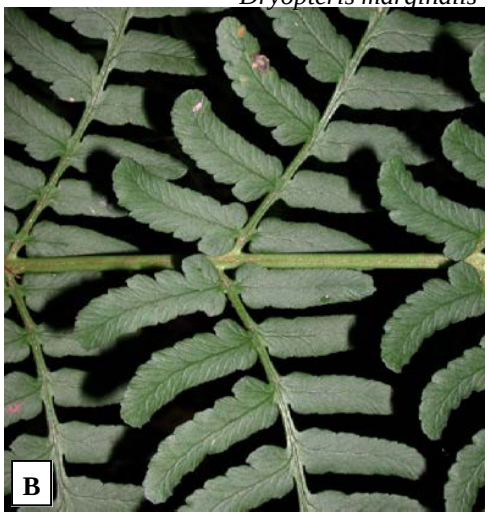
Sori: *Distinctly located as two parallel rows along margin*; round, small; indusia present

Human Uses: It was one of the most effective treatments known for tapeworms. An infusion of the rootstock was used in the treatment of rheumatism. A warm infusion, held in the mouth, was used to treat toothaches.

Dryopteris: (Greek) *drys*—oak, *pteris*—fern; referring to the many species that are found in oak woods

Marginalis: (Latin) *marginatus*—enclosed with a margin; referring to the position of the sori on leafule margin

Native: Yes
Evergreen: Yes



Robbin Moran

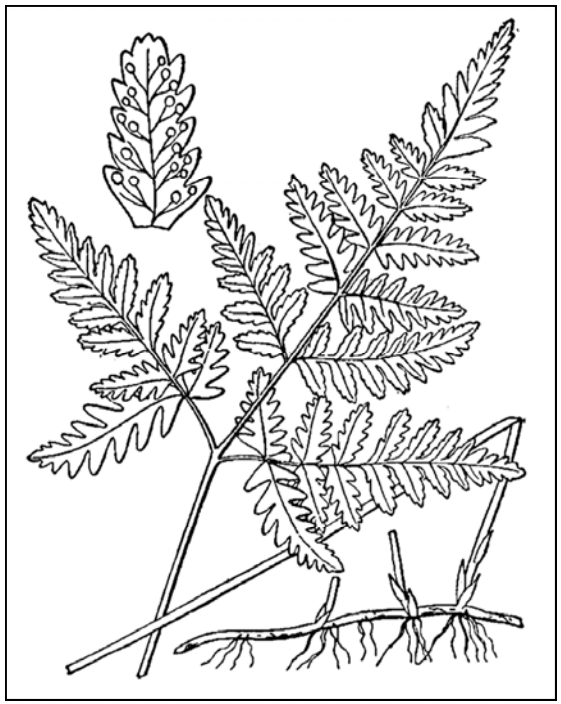
Arieh Tal

Robbin Moran

A. Fertile leaflet with sori on margin
B. Sterile leaflets showing variations in cut
C. Fiddleheads beginning to unfurl
D. Whole plant

Western Oak Fern

Gymnocarpium dryopteris



Habitat: Found in cool, shaded woodlands and stream banks where the substrate is slightly rocky, moist and sub-acidic; sometimes on boulders and cliffs of various rock types

Population Status: Common; found throughout NE and NY, except in RI where it is *listed as threatened*

I.D. Notes: Bipinnate-pinnatifid; full taper; monomorphic

Leaf: Up to 14" or more in length; *divided from central point along rachis into three parts (1 larger, 2 smaller);* arching backward, sometimes becoming parallel with ground

Leaflets: Variable in shape and cut; tips blunt; undersides sometimes glandular; *grooves of costae not connected to groove on rachis*; veins simple to forked; margin of leafules wavy to slightly lobed

Rachis: Green to dark purplish-green, delicate; sometimes glandular

Petiole: Slender; dark purplish-brown at base, turning yellowish green above; longer than blade; *sparsely scaled and glandular*

Rootstock: Long creeping, branching; slender; black and scaly; grows leaves all season

Sori: Small and round; located at margin; without indusia

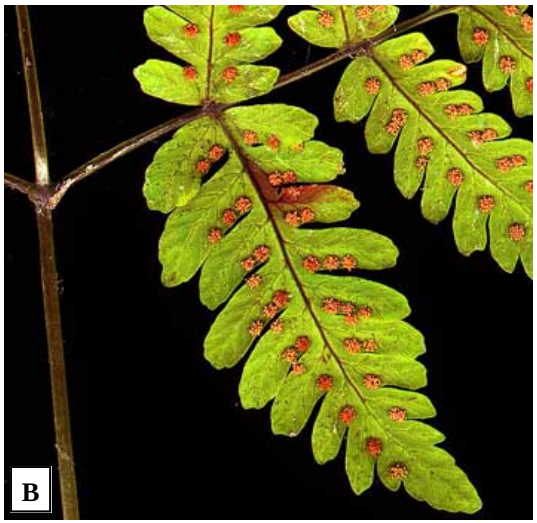
Human Uses: Well suited for moist, shaded rock gardens.

Gymnocarpium: (Greek) *gymnos*—naked, *karpos*—fruit; referring to their lack of indusia

Dryopteris: (Greek) *drys*—oak, *pteris*—fern

Native: Yes
Evergreen: No

Gymnocarpium dryopteris

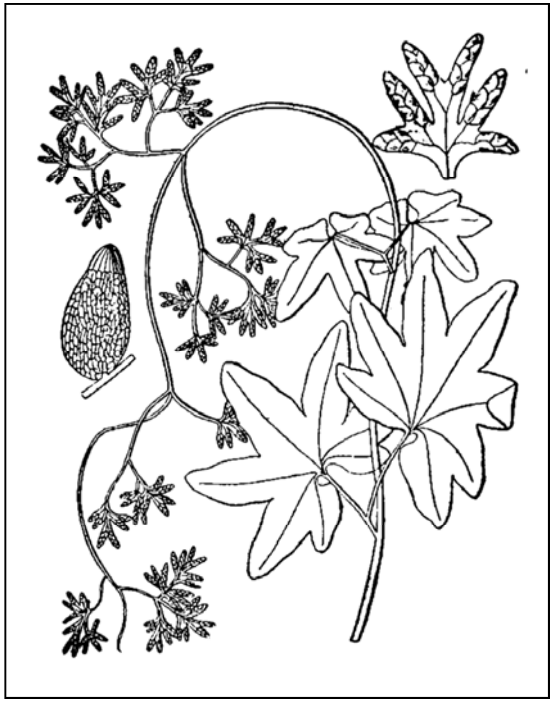


Gary Fewless

A. Whole plant
B. Fertile leafules with sori
C. Sterile leafule

American Climbing Fern

Lygodium palmatum



Habitat: Partial to full shade; found in moist to wet acidic substrates of stream banks, ravines, emergent swamps, and thickets; FACW, usually found in wetlands (67%-99% of the time)

Population Status: Uncommon, localized in MA, CT, and RI; rare in NH and VT; absent from ME and other northern areas; *listed as endangered in VT and NY*

I.D. Notes: A unique form; dimorphic

Sterile Leaflets: Resembles the shape of a hand; *deeply cut into 4-7 blunt, finger-like lobes;* light green, thin, and smooth; upper surface slightly hairy; veins simple

Rachis: *A long, wiry, sinuous climbing structure that wraps itself around herbaceous plants and shrubs*; black at base, turning brownish to green above; round, shining; can grow 4' in length

Petiole: Dark, hairy

Fertile Leaflets: *Borne only at top of vine*; much smaller; shriveled, especially when sori are fully mature; 5-7 narrow, blunt, finger-like lobes

Sori: Two parallel rows of spore cases, covered by scales and *overlaid with indusia-like growths of the leaf surface*

Rootstock: Creeping, branching; black; covered with dark reddish to black hairs

Human Uses: Unknown

Lygodium: (Greek) *lygodes*—flexible; referring to the rachis and its ability to climb

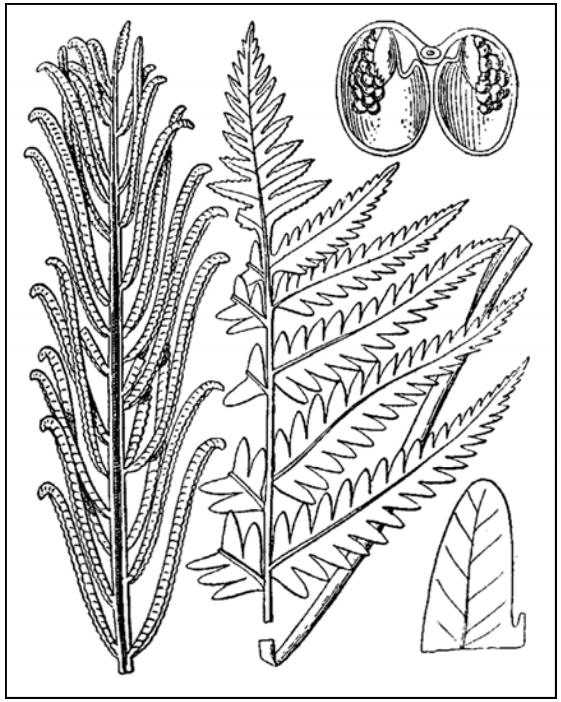
Palmatum: (Latin) palm-shaped; referring to the palmate shape of the leaf

Native: Yes
Evergreen: Yes—sterile leaves last until the beginning of next years growth; No—fertile leaves wither in autumn

A. Sterile (larger, hand-shaped) and fertile (smaller, lacy looking) leaves showing climbing habit
B. Sterile leaves

Ostrich Fern

Matteuccia struthiopteris



Habitat: Found along the banks of streams and rivers, in wet woodlands, swamps, and in alluvium and sand deposits; generally in circumneutral substrates; FACW, usually found in wetlands (67%-99% of the time)

Population Status: Abundant; found throughout NE and NY

Eco-indicator: Rich, alluvial sites

I.D. Notes: Pinnate-pinnatifid; full taper; *strongly dimorphic*

Sterile Leaf: Very large, up to 5' +/- tall; *widest toward tip*; outline akin to an ostrich feather; dark green, growing in vase-like form; *blade tip abruptly tapered*

Leaflets: Narrow and long; veins simple; lobes closest to rachis sometimes point outward and crossing over the rachis; tips pointed

Rachis: Sparsely covered with hairs and/or scales; green; deeply grooved

Petiole: Very stout; *deeply grooved; swollen at base,* dark purple-brown; much shorter than blade

Fertile Leaf: 24" tall when mature; appearing in summer, green at first, turning brown as sori develop; much shorter; stiff and hard, *persisting throughout the year*; leaflets appear shriveled up, with curled margin hiding sori

Sori: Positioned underneath rolled over margin; *without indusia*; *spores green (containing chloroplast) and dispersed the following spring*

Rootstock: Erect; densely covered with scales, projecting leaves in circular fashion; stolons from rootstock often reproduce 2-3 plantlets per year

Human Uses: Fiddleheads are collected in early spring and used like asparagus in a variety of dishes (see Appendix A: Ostrich Fern Fiddlehead Recipes). Well suited for moist, shaded to partially sunny gardens.

Matteuccia: named for Carlo Matteucci, an Italian electrophysiologist (1811-1863)

Struthiopteris: (Greek) *struthos*—ostrich, *pteris*—fern; referring to the leaf resembling an ostrich plume

Native: Yes
Evergreen: No

J. Liira

www.sakarikauppinen.com

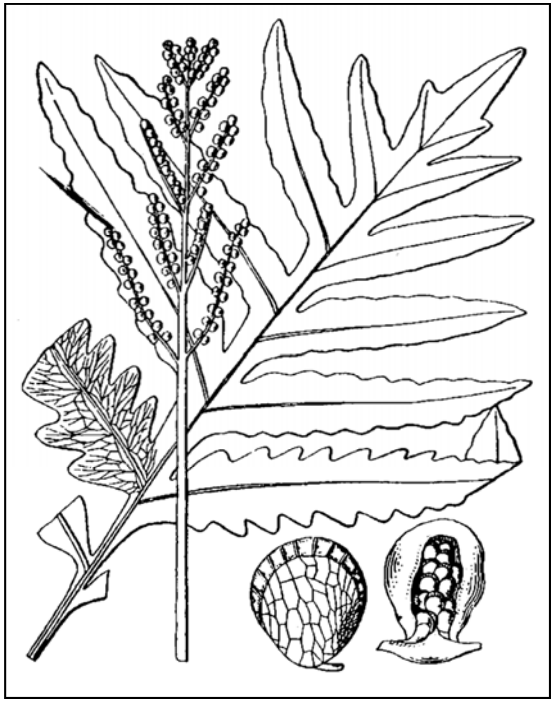
Jan Wesemberg

Wayne Dumbleton

A. Unfurling fiddlehead
B. Fertile leaf with curving leaflets
C. Young whole plants
D. Sterile leaves showing ostrich plume-like appearance
E. Sterile leaf tip showing abrupt taper

Sensitive Fern

Onoclea sensibilis



Habitat: Full sun to shade; found on stream banks, woodland edges, meadows and along rock fences of damp to inundated, sub-acidic substrates; can form dense colonies; FACW, usually found in wetlands (67%-99% of the time)

Population Status: Abundant; found throughout NE and NY

Eco-indicator: Rich wetlands

I.D. Notes: Pinnatifid; widest at base; *strongly dimorphic*; can resemble *Woodwardia areolata*

Sterile Leaf: Up to 42"+/- tall; yellowish-green to pale green; triangular, broad

Segments: *Margin lobed, entire*; lowest pair stemmed to rachis, creating leaflets; upper pairs always winged to rachis; *lower leaflets opposite* and widest at middle, tapering toward rachis and leaflet tip; costae smooth or with cinnamon-colored hair; *veins prominently netted along rachis and costae*

Rachis: Smooth or with cinnamon colored hair; tan to yellow

Petiole: Generally longer than leaf; base stout, brown, turning yellowish-green above; with few scales; generally longer than blade

Fertile Leaf: 12"+/- tall, 1"+/- wide when mature; upright to slightly arched; early growth green, with lobed, opposite leaflets, changing as it matures to a shriveled, curled form, with *vertical pointing clusters of dark brown, beaded leaflets;* persisting for a couple of seasons

Sori: Contained within the curled, bead-like structures; indusia small, hidden; *spores green (containing chloroplast) and dispersed the following spring*

Rootstock: Long creeping, sometimes forking; stout, thick; generally smooth

Human Uses: An infusion of the rootstock was used to treat pain following childbirth. A poultice of the plant was used to treat deep cuts.

Onoclea: (Greek) *onos*—vessel, *kleiein*—to close; referring to the beaded-like structures that enclose the sori

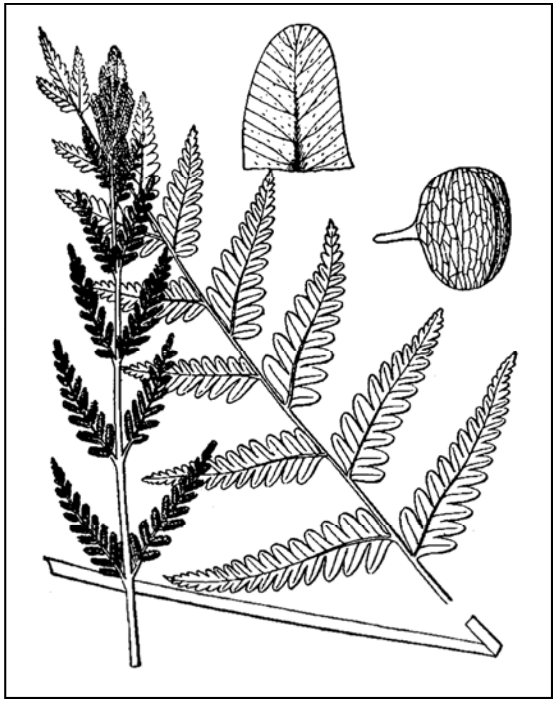
Sensibilis: (Latin) sensitive, referring to its quick death following hard frosts

Native: Yes
Evergreen: No—sterile leaf; Yes—fertile leaf

A. Young fiddleheads
B. Sterile leaf showing venation
C. Developing fertile leaf with clustered sporangia
D. Sterile leaf with leaflets and segments
E. Young sterile leaf

Cinnamon Fern

Osmunda cinnamomea



Habitat: Shade to partial shade; in wet, acidic substrates; found on the edges of swamps and on hummocks within swamps, stream banks, and along pond and lake edges; FACW, usually found in wetlands (67%-99% of the time)

Population Status: Abundant; found throughout NE and NY; one of the most ubiquitous ferns of our area; can form seemingly impenetrable, jungle-like colonies—some of which can be a hundred or more years old

Eco-indicator: Acidic wetlands

I.D. Notes: Pinnate-pinnatifid; semi taper; *strongly dimorphic*; can resemble *Osmunda claytoniana* and *Woodwardia virginica*

Sterile Leaf: Up to 5' +/- tall; arching; dark green, leathery appearance; emanates from rootstock in circular, vase-like fashion; gradual taper toward tip

Leaflets: Pointed; *characteristic tuft of cinnamon-colored wool at axil of leaflets*; veins forked 1 to 3 times

Rachis: Green; sparsely covered with cinnamon-colored wool

Petiole: Green; densely covered with cinnamon-colored wool in spring, changing to a sparse covering once matured; round; stout; shorter than blade

Fertile Leaf: Located in the center of the sterile leaves; *first to appear in early spring*; develops fully and withers by late spring; green at first, turning bright rusty-red—very distinct

Sori: Large, clustered, short stemmed spore cases; spores green at first, turning cinnamon colored; without indusia

Rootstock: *Mat forming, typically exposed above ground*—moss-like appearance; very stout, bristly, rough to the touch; stubbly

Osmunda: origin unknown, possibly (Latin) *os*—bone, *munda*—cure; referring to its use as a rickets remedy

Cinnamomea: (Latin) like cinnamon; referring to the cinnamon colored hair of the fiddleheads and young leaves

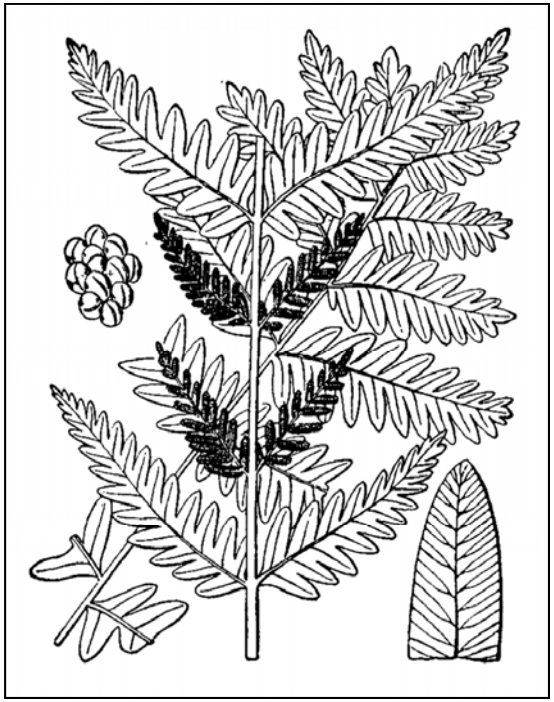
Native: Yes
Evergreen: No

Human Uses: A decoction of the root has been rubbed into affected joints as a treatment for rheumatism as well as used internally to treat headaches, joint pain, rheumatism, colds, and promote the flow of milk in a nursing mother. Well suited for moist, shaded to partially sunny gardens.

A. Leathery, pointed sterile leaflets
B. Woolly axils of leaflets
C. Young fiddleheads: taller ones are fertile leaves and shorter ones are sterile leaves
D. Whole plant showing cinnamon-colored fertile leaves

Interrupted Fern

Osmunda claytoniana



Habitat: Shade to partial shade; commonly found along roadsides, woodlands edges, and on hummocks in swamps; can tolerate a wide range of soils and locations, but prefers substrates that are dry to damp over wet to swampy; FAC, equally found in wetlands and non-wetlands (34%-66% of the time)

Population Status: Abundant; found throughout NE and NY; one of the most ubiquitous ferns of our area; can form seemingly impenetrable, jungle-like colonies

I.D. Notes: Pinnate-pinnatifid; semi taper; dimorphic; can resemble *Osmunda cinnamomea*

Sterile Leaf**:** Up to 5' +/- tall; arching; emanates from rootstock in circular, vase-like fashion

Leaflets: Tapering to blunt tips; lobes overlapping; *veins uniformly forked;*

Rachis: Green; sparsely covered with woolly hair

Petiole: Green; sparsely covered with woolly hair; round; stout; shorter than blade

Fertile Leaf: *Leaflets "interrupt" sterile leaf approximately half way up*; taller, more erect; leaflets below the "interruption" opposite and widely spaced

Sori: Large, clustered, short stemmed spore cases; spores green at first, turning brown; without indusia

Rootstock: *Mat forming, typically exposed above ground*—moss-like appearance; very stout, bristly, rough to the touch; stubbly

Human Uses: Roots were once used as a remedy for rickets. Well suited for moist, shaded to partially sunny gardens.

Osmunda: origin unknown, possibly (Latin) *os*—bone, *munda*—cure; referring to its use as a rickets remedy

Claytoniana: (Latin) named for John Clayton, an early American botanist (1693-1773)

Native: Yes
Evergreen: No

A. Fiddlehead and woolly petioles
B. Early fertile leaves
C. Fertile leaflet showing the clustered sporangia
D. Sterile and “interrupted” fertile leaves

Royal Fern

Osmunda regalis

Habitat: Wet-loving, can tolerate growing in standing water; found along streams, in bogs, swamps, marshes, thickets, ditches, pastures, and meadows; OBL, occurs almost always in wetlands (>99% of the time)

Population Status: Common; reported throughout NE and NY; can form jungle like growth

Eco-indicator: Moderate wetlands

I.D. Notes: Bipinnate; semi-tapering; dimorphic

Sterile Leaf: Very distinct—resembling locust tree branches; can attain a height of 6' +/-; grows in dense clusters, with leaves overlapping one another

Leaflets: Clean and simple in appearance; tips blunt; costae yellowish-brown; leafules distinctly stemmed; *bases of leafules can be partially to strongly lobed to heart-shaped*; margin of leafules slightly serrated; *veins 1-3 times forked*

Rachis: Reddish-brown with greenish streaks; round, slender

Petiole: Reddish at base, turning straw-colored above; slender; shorter than blade, smooth

Fertile Leaf: *With distinct, brownish leaflets growing from leaf tip*; base of leaflets sometimes with blackish hairs

Sori: Large, clustered, short stemmed spore cases; spores green first, turning brown; without indusia

Rootstock: *Mat forming, typically exposed above ground*—moss-like appearance; very stout, bristly, rough to the touch; embedded deep in ground

Osmunda: origin unknown, possibly (Latin) *os*—bone, *munda*—cure; referring to its use as a rickets remedy

Regalis: (Latin) royal; referring to its stately appearance

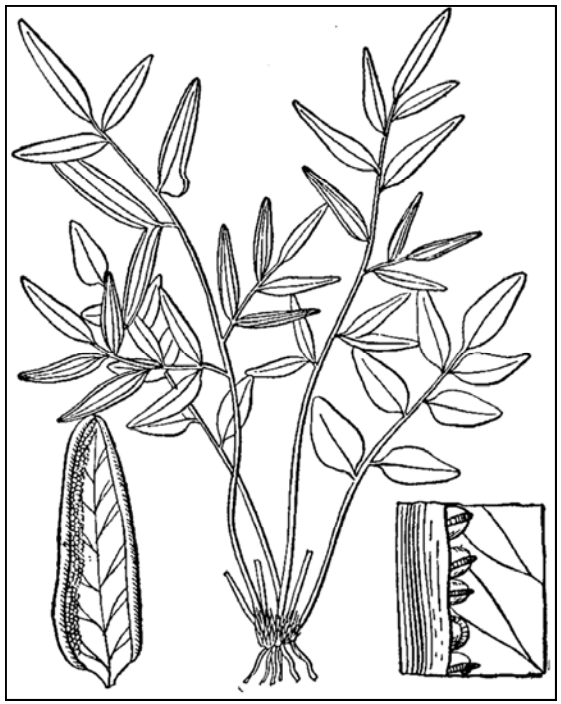
Native: Yes
Evergreen: No

Human Uses: Roots were once used as a remedy for rickets. The leaves were used to make compresses for external application of wounds and rheumatic joints. An infusion of the leaves, combined with wild ginger roots was used to treat children with intestinal worms. The hairs of the plant were mixed with wool to make clothes. The roots were once widely used for potting orchids and other epiphytes. Well suited for moist, shaded gardens.

A. Fertile leaf showing fertile leaflets at tip
B. Sterile leaflets showing varied cuts at bases of leafules
C. Unfurling fiddleheads
D. Sterile leaf

Purple Cliff Brake

Pellaea atropurpurea



Habitat: Found on dry, exposed limestone outcroppings, cliffs, and talus slopes; also found on other rock types, including granite, shale, and sandstone; *rarely terrestrial*

Population Status: Rare; local populations reported throughout NY and western VT, CT, and MA; *listed as endangered in RI; absent from NH and ME*

I.D. Notes: Pinnate or bipinnate; widest at base; slightly dimorphic

Sterile Leaf: Up to 16" tall +/-; *leathery texture*; cut is variable; dull bluish-green

Leaflets: Shape and sizes vary from bottom of blade toward tip; *generally broadest at base and triangular*; sometimes with Christmas-stocking-like shape; *margin curled*; sometimes tilted horizontal to rachis; veins forked

Rachis: Dark purplish-brown; generally covered with whitish hairs

Petiole: Usually half the length of the blade; dark purplish-brown, powdery, with hairs; wiry

Fertile Leaf: Typically taller, more divided; leaflets with curled margin

Sori: Positioned underneath curled margin; *without indusia*

Rootstock: Short, erect or slightly creeping; densely covered with brown scales

Human Uses: Unknown

Pellaea: (Greek) *pellos*—dusky; referring to the dull, bluish-gray leaflets

Atropurpurea: (Latin) *atropurpureus*—dark purple; referring to the color of the rachis

Native: Yes
Evergreen: Yes

Dan Tenaglia

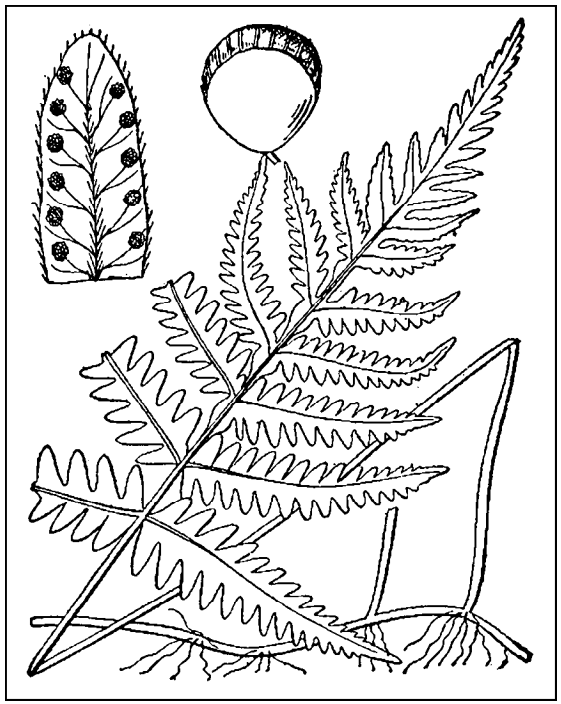
Arthur Haines

Dan Tenaglia

A. Whole plant
B. Whole plant showing varied cut from lower leaflets toward leaf tip
C. Purple rachis with whitish hairs
D. Fertile leaflets with curved margin covering sori

Long Beech Fern

Phegopteris connectilis



Habitat: Semi-shade to shade; commonly found as small colonies in moist, rich substrates of stream banks and woodlands; also favors ravines and moist, acidic substrates on cliffs; sometimes occurring under waterfalls; found in herbaceous snow bank communities within the alpine zone

Population Status: Common throughout NE and NY, except for RI, where it's *listed as threatened*

I.D. Notes: Pinnate-pinnatifid; semi taper; monomorphic

Leaf: Up to 14" +/- tall; greenish-yellow; arching backward; rapidly tapers toward tip; soft and velvety to the touch

Leaflets: *Lowest pair stemmed to rachis, pointing outward and downward, tapering toward rachis and leaflet tip*; all other leaflets winged to rachis; lower tips of leaflets pointed, upper tips blunted; costae and midveins hairy, with many scales; lobe margin wavy; veins forked

Rachis: Green, densely scaled and hairy above and beneath

Petiole: Variable in length, though generally longer than blade; densely scaled and hairy

Rootstock: Creeping and branching; black, with scales

Sori: Located near margin in parallel rows; without indusia

Human Uses: Well suited for massing and under-planting in partially shaded gardens.

Phegopteris: (Greek) *phegos*—beech, *pteris*—fern; referring to ferns growing under beech trees

Connectilis: (Latin) *connectens*—to fasten together; referring to the upper leaflets being connected

Native: Yes
Evergreen: No

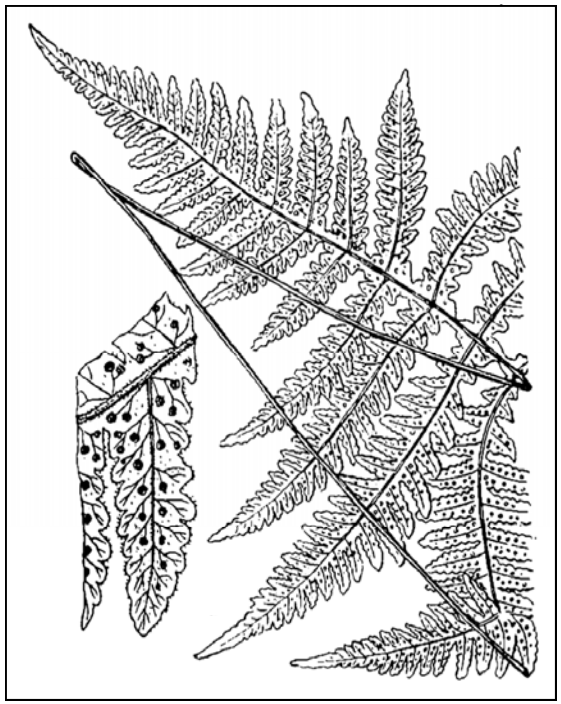
John Maunder

John Maunder

A. Sterile leaf
B. Young leaves
C. Fertile leaflets showing hairy rachis and costa

Broad Beech Fern

Phegopteris hexagonoptera



Habitat: Found in sunny to shaded, open areas of rocky woodlands; in moist to dry, rich to moderately acidic substrates; FAC, equally found in wetlands and non-wetlands (34%-66% of the time)

Population Status: Fairly common throughout NE and NY; absent in northern ME

I.D. Notes: Pinnate-pinnatifid; widest at base; monomorphic

Leaf: Light green; arching backward; rapidly tapers toward tip; *distinctly broad*—up to 16" +/-; has sweet odor when lightly pressed

Leaflets: *All winged to rachis*; costae and midveins slightly hairy; lowest pair distinctly large and widest at middle, tapering toward rachis and leaflet tip; pointed; margin of lobes serrated into blunt teeth; veins forked

Rachis: Green to straw-colored, with whitish scales; winged throughout

Petiole: Reddish-brown at base, turning straw-colored above; base with few tan scales and hairs; longer than blade

Rootstock: Long creeping and branching; very scaly; black

Sori: Small; located at margin; *without indusia*

Human Uses: Well suited for massing and under-planting in partially shaded gardens.

Phegopteris: (Greek) *phegos*—beech, *pteris*—fern; referring to ferns growing under beech trees

Hexagonoptera: (Greek) *hexagonos*—six sided; referring to the angular winged rachis

Native: Yes
Evergreen: No

Phegopteris hexagonoptera

A. Whole plant
B. Whole plant showing distinctly larger lower leaflets with a double taper
C. Fertile leaflets with sori

Robbin Moran

Jean Everett

Appalachian Polypody

Polypodium appalachianum

Habitat: Shade to semi-shade to sun; most commonly found forming dense mats atop debris laden boulders, in crevices, and on cliffs, ledges, and rocky slopes of various rock types

Population Status: Fairly common; found throughout NE and NY

I.D. Notes: Pinnatifid; widest at base or semi taper; monomorphic; can resemble *Polypodium virginianum*

Leaf: Up to 1' +/- tall; leathery, light to dark green; tapering to pointed tip; widest toward or at the base

Segments: Uniformly spaced in alternating fashion; *slightly tapering to narrowed tips*; veins forked

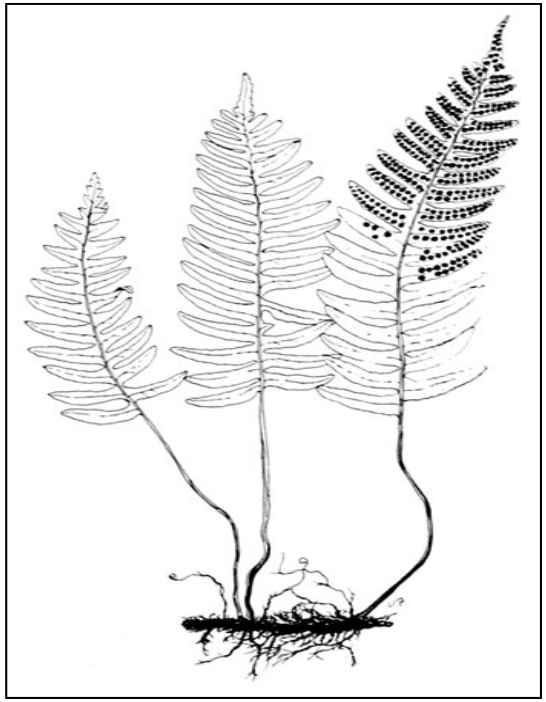
Rachis: Straw-colored; *distinctly raised, sits on front of blade*; smooth, round

Petiole: Shorter than blade; round and smooth; scales golden brown

Rootstock: Creeping along horizontal plane; *covered with golden-brown scales*

Sori: Round, rather large relative to segments; in two parallel rows; without indusia

Human Uses: Well suited for a shaded rock garden and for indoor plantings.



V. Fulford from Ferns and Fern Allies of Canada, William J. Cody and Donald M. Britton, 1989, © Agriculture Canada

Polypodium: (Greek) *polys*—many, *podion*—foot; referring to the "footprints" left on the rootstock where petioles have fallen off

Appalachianum: (Latin) of the Appalachians; referring to where the species is found

Native: Yes
Evergreen: Yes

Polypodium appalachianum

Robbin Moran

John Maunder

A. Murray Evans

A. Whole plant showing narrowed tips of segments
B. Fertile segments with mature (rusty colored) and developing (yellow colored) sori
C. Whole plant

Rock Polypody

Polypodium virginianum

Habitat: Shade to semi-shade to sun; most commonly found forming dense mats atop debris laden boulders, in crevices, and on cliffs, ledges and rocky slopes of various rock types; also found on decaying stumps and logs

Population Status: Abundant; reported throughout NE and NY

I.D. Notes: Pinnatifid; semi taper; monomorphic; can resemble *Polypodium appalachianum*

Leaf: Up to 1' +/- tall; light to dark green; leathery; tapers to pointed tip; widest toward middle

Segments: Tips sometimes with rounded teeth; *uniformly spaced in alternating fashion*; can have variable growth forms that include cut margin and shaggy appearance; costae purplish; veins forked

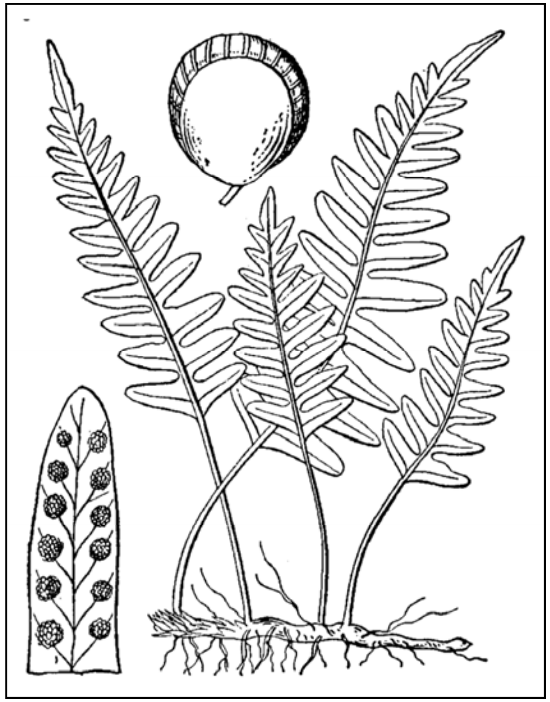
Rachis: Straw-colored; *distinctly raised, sits on upper surface of blade*; smooth, round

Petiole: Shorter than blade; round and smooth; scales dark brown

Rootstock: Creeping along horizontal plane; *covered with both light and dark brown scales*

Sori: Round, large relative to segments; in two parallel rows; without indusia

Human Uses: In European herbal medicine it was traditionally used as a treatment for hepatitis and jaundice and as a remedy for indigestion. A tea made from the rootstock was used to treat pleurisy, hives, sore throats, and stomach aches. It was also considered beneficial for lung ailments and liver diseases. Well suited for a shaded rock garden and for indoor plantings.



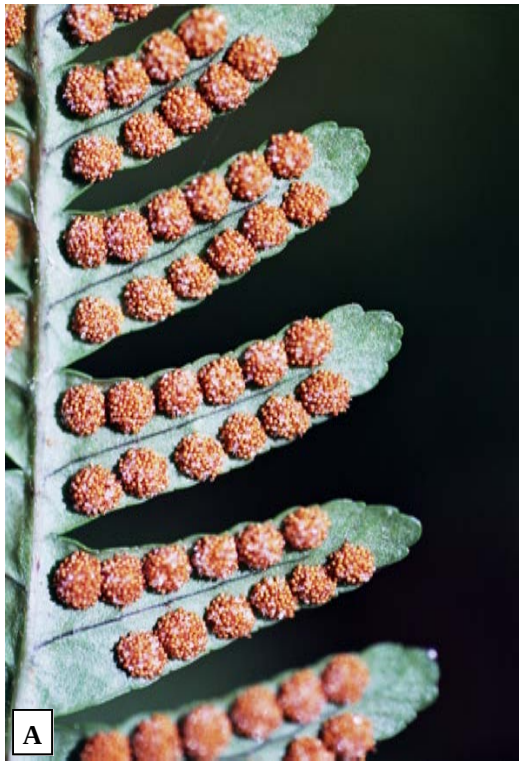
Polypodium: (Greek) *polys*—many, *podion*—foot; referring to the "footprints" left on the rootstock where petioles have fallen off

Virginianum: (Latin) of Virginia; referring to the source of the specimens Carolus Linnaeus described

Native: Yes
Evergreen: Yes

Polypodium virginianum

J.S. Peterson



A. Fertile segments with paired sori
B. Whole plant
C. Sterile leaf with raised rachis on upper surface

Christmas Fern

Polystichum acrostichoides

Habitat: Found in a variety of shaded habitats, including forested stream banks, moist forested slopes, along stone fences, and gulches; tolerant of acidic to neutral soils

Population Status: Abundant in central and southern NE and throughout NY; less common in northern ME

I.D. Notes: Pinnate; semi taper; dimorphic

Sterile Leaf: Up to 3'+/- tall; leathery, coarse in appearance and touch; tapering to blunt point

Leaflets: Generally widest at base, *with Christmas-stocking-like appearance*; margin finely serrated, and bristle tipped; sometimes with variable forms, such that leaflets are twisted, deeply cut or widest at tip; veins forked

Rachis: Scaly; grooved in front; green

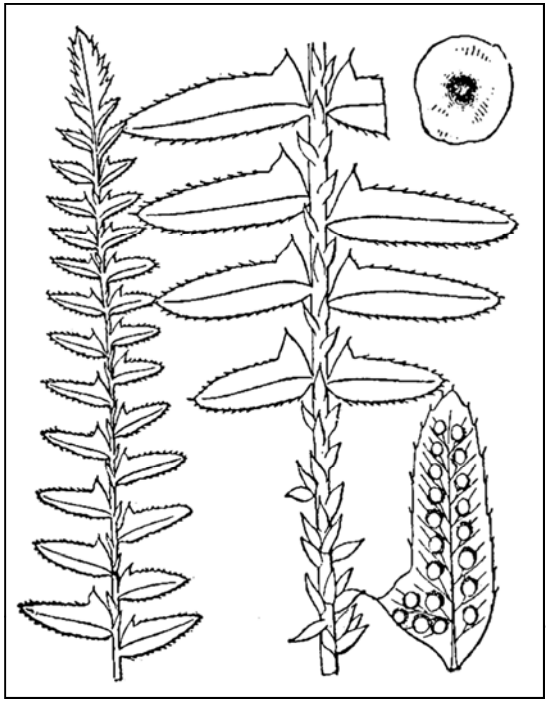
Petiole: Shorter than blade; densely scaled; *base swollen*, brown, turning green above

Fertile Leaf: Taller and more erect

Sori: Densely covers entire undersides; indusia circular, attached at center

Rootstock: Creeping to slightly erect; densely scaled; usually with withered leaves attached

Human Uses: Used by early New England settlers as a Christmas decoration. Well suited for use in a moist, shaded garden.



Polystichum: (Greek) *poly*—many, *stichos*—row; referring to the several parallel rows of sori

Acrostichoides: (Latin) resembling A*crostichum* (a genus of ferns found in the tropics)—referring to its many rows of sori

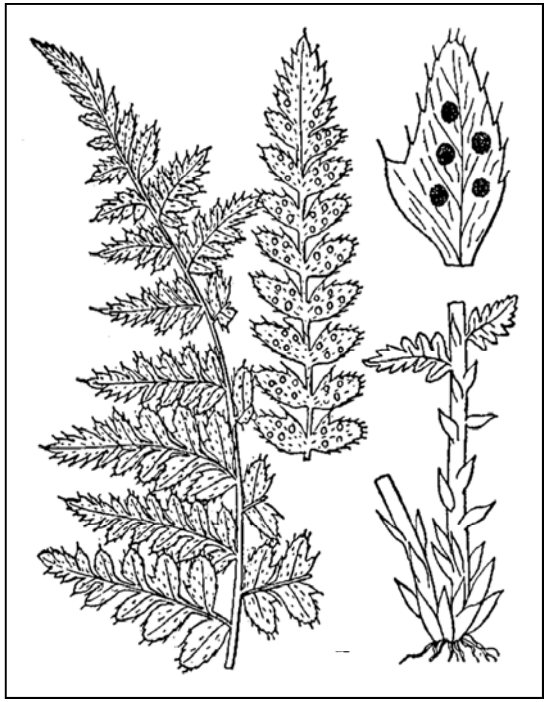
Native: Yes
Evergreen: Yes

Susan Farmer

A. Serrated margin variation
B. Christmas-stocking-like shape of leaflets
C. Crisped margin variation
D. Sterile leaf
E. Fiddlehead
F. Fertile leaflets with sori covering entire underside

Braun's Holly Fern

Polystichum braunii



Habitat: Shade loving; found on circumneutral soils of northern locations; in cool, rich, moist rocky woodlands, ravines, and along streams

Population Status: Uncommon in NY, MA, VT, NH, and ME; absent from CT and RI; *listed as endangered in MA*

I.D. Notes: Bipinnate; full taper; monomorphic

Leaf: Up to 3' +/- tall; *coarse, thick, shiny*; *leathery in appearance and touch*; narrow; some leaves of previous year withered and prostrate; yellowish green to olive green

Leaflets: Shiny; upper pairs pointed at tips, lower pairs blunt; spaced close, sometimes overlapping; *leafules bristle tipped and hairy on upper surface*; veins forked

Rachis: Grooved; light brown; densely scaled

Petiole: Shorter than blade; stout; densely covered with brown scales and pale tan hairs

Rootstock: Erect, stout; very scaly; *leaves emanate in circular fashion*

Sori: Small, circular; located near midvein, in two parallel rows; *indusia circular, with wavy margin*

Human Uses: Well suited for a shaded rock garden.

Polystichum: (Greek) *polys*—many, *stichos*—rows; referring to the parallel rows of sori

Braunii: (Latin) named for Alexander Braun, a German botanist (1805-1877)

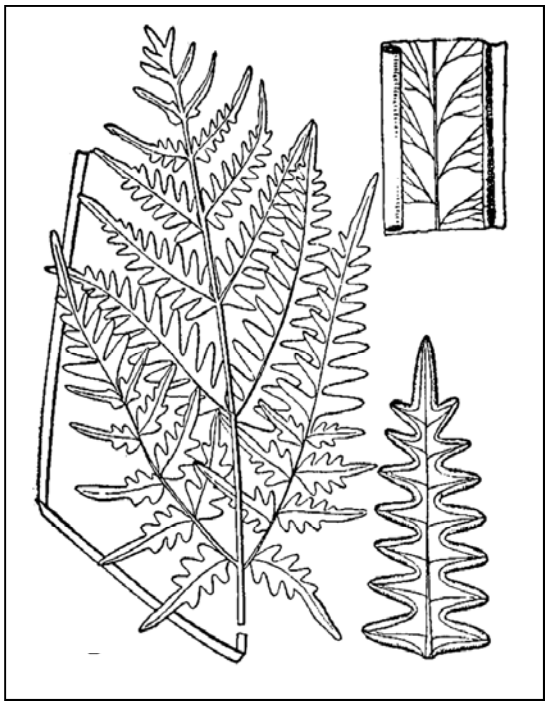
Native: Yes
Evergreen: Semi

J. Liira

A. Hairy leaflets and rachis
B. Fertile leaf with sori and scaled rachis
C. Circular rootstock with curled up fiddleheads
D. Sterile leaf
E. Unfurling young leaves

Western Bracken Fern

Pteridium aquilinum



Habitat: Widespread; sun-loving to partial shade; found in dry, poor soils of trail and woodland edges, abandoned fields, waste places, thickets, and burned areas

Population Status: Abundant; most common of all the ferns; spread throughout NE and NY, capable of forming massive colonies

Eco-indicator: Dry, poor, coarse soils

I.D. Notes: Bipinnate-pinnatifid to tripinnate; widest at base; monomorphic

Leaf: Up to 3' +/- tall; *divided along rachis into three broadly triangular parts (1 larger, 2 smaller)*; arching backward, sometimes becoming parallel with ground; becomes increasingly leathery as the growing season progresses; easily damaged by frost

Leaflets: *Variable in shape and cut*, especially toward tips; tips distinctly narrow, blunt; costae sometimes with wool-like hair; veins forked

Rachis: Green; grooved; slightly hairy

Petiole: Greenish when young, turning dark brownish-red with age; rigid, stout; equal to or longer than blade

Rootstock: Very long creeping and branching; can extend up to 15' +/- in length, and 10' +/- deep; up to 1" +/- thick; sometimes hairy

Sori: Forms a *continuous outline along slightly curled margin;* silvery first, turning rusty-brown; indusia formed by curled margin

Pteridium: (Greek) *pteris*—fern

Aquilinum: (Latin): *aquilus*—eagle-like; perhaps referring to the talon-like shape of the unfurling fiddlehead

Native: Yes
Evergreen: No

Human Uses: The blades were used in steam baths as a treatment for arthritis. A decoction of the fern was used in the treatment of tuberculosis. A tincture of the rootstock in wine is used in the treatment of rheumatism. A tea made from the rootstock is used in the treatment of stomach cramps, chest pains, internal bleeding, diarrhea, colds and to expel worms. A poultice of the root is applied to sores, and burns. A glue can be made from the rootstock. A brown dye can be made from the leaves. The whole fern is an excellent addition to the compost heap; it is rich in potash and makes an excellent mulch for tree seeds.

A. Unfurling fiddleheads
B. Fertile leaflets with sori along margin
C. Leaf showing variable cut
D. Sterile leaf showing division into 3 leaves

Little Curly Grass Fern

Schizaea pusilla

Habitat: Found in wet, acidic substrates of swamps and bogs, *particularly cedar swamps*; *OBL*, occurring always in wetlands (>99% of the time)

Population Status: Very rare; only found on Long Island, NY; *listed as endangered in NY*

I.D. Notes: A unique form; dimorphic

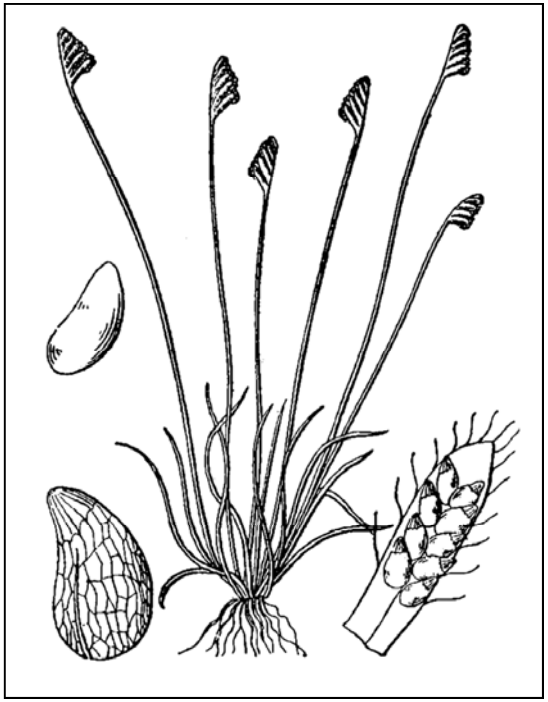
Sterile Leaf: Appearing as "curly grass"; wiry, twisted; dense at base; up to 2"+/- tall; pale green; *margin slightly paler and thicker*

Fertile Leaf: Taller, although generally not exceeding 6" +/-; erect; *with folded leaflets;* green when young, turning brown; petiole slightly grooved

Sori: In two parallel rows, covering entire underside

Rootstock: Erect, slender; dark; sparsely hairy

Human Uses: Unknown



Schizaea: (Greek) *skizein*—to split; referring to the blades being split into narrow lobes

Pusilla: (Latin): very small; referring to the size of the leaves

Native: Yes
Evergreen: Yes

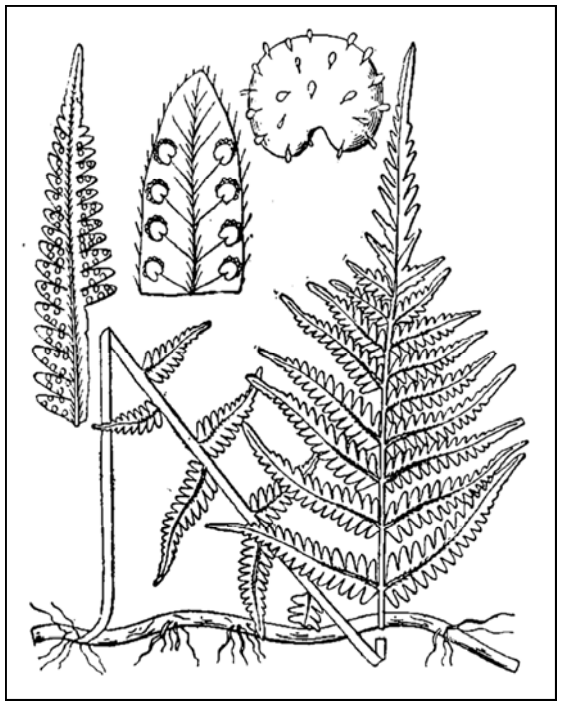
Robbin Moran

Jim Stasz

A. Sterile leaf appearing as “curly grass”
B. Fertile leaf with folded leaflets at apex

New York Fern

Thelypteris noveboracensis



Habitat: Found in sunny to shaded spots of woodlands, thickets, and the drier edges of swamps; grows in moist, moderately acidic to humus rich substrates; sometimes forming colonies in sunlit canopy gaps; FAC, equally found in wetlands and non-wetlands (34%-66% of the time)

Population Status: Abundant; reported throughout NE and NY, except in northern ME

I.D. notes: Pinnate-pinnatifid; *full taper*; monomorphic

Leaf: Up to 2' +/- tall; yellowish-green; lacy appearance; *grows in tufts along creeping rootstock*; widest at middle

Leaflets: *Long, tapering to blunt point*; lower pairs miniature relative to upper sets; hairy beneath; veins mostly simple, rarely forked

Rachis: Pale green to straw-colored; *covered with whitish hair*

Petiole: Thin, covered with hairs; base black turning to brownish-red to straw-colored above; base sparsely scaled

Rootstock: Black to dark brown; widely creeping and branched; sparsely scaled

Sori: Few, located near margin; orangey-brown; *indusia slightly hairy*

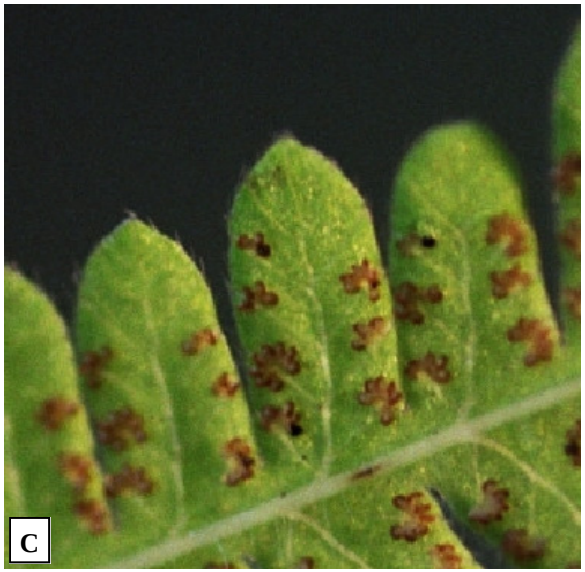
Human Uses: Well suited for massing and under-planting in partially shaded gardens.

Thelypteris: (Greek) *thelus*—female, *pteris*—fern

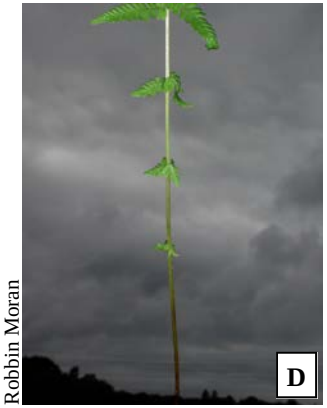
Noveboracensis (Latin): of New York

Native: Yes
Evergreen: No

Thelypteris noveboracensis



A. Sterile leaflets
B. Tips of sterile leaflets showing taper
C. Fertile leaflet with developing sori
D. Lower leaf showing full taper of leaflets
E. Whole plant

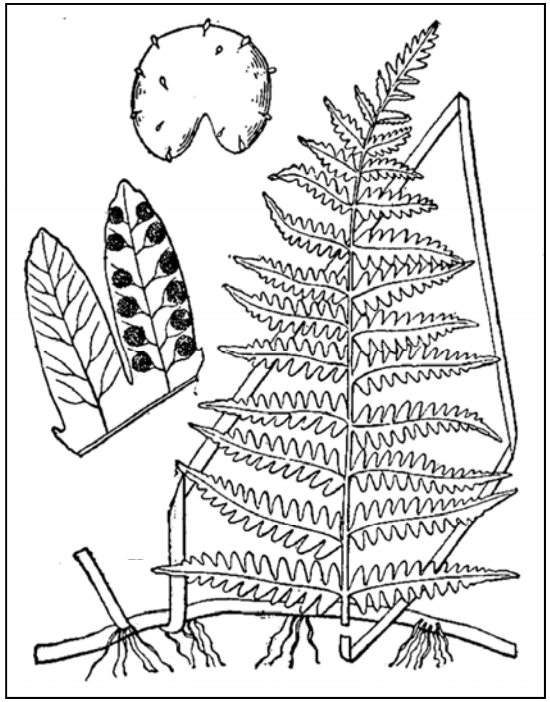


Robbin Moran

Robbin Moran

Eastern Marsh Fern

Thelypteris palustris



Habitat: Sun to partial shade; found in rich, clayey substrates of meadows, disturbed woodlands, marshes, swamps, bogs, ditches, and along stream banks; FACW+, usually more frequently found in wetlands (67%-99% of the time)

Population Status: Abundant; reported throughout NE and NY; forms dense colonies that track the sun's movement

I.D. Notes: Pinnate-pinnatifid; semi taper; *dimorphic*; can resemble *Thelypteris simulata*

Sterile Leaf: Up to 3' +/- tall; pale green; delicate in appearance; tapers to pointed tip; twisting-like appearance

Leaflets: Lower pairs horizontal to rachis; wavy, curved; *slightly swollen at base of costae*; widest at rachis; *veins forked*

Rachis: Pale green to purplish-green; smooth and slender; grooved

Petiole: Purplish-black at base, turning greenish above, with some dark purplish splotches; longer than leaf; smooth and slender

Fertile Leaf: Much taller, *with margin curled over sori*; rachis rusty red; leaflets becoming leathery

Sori: Numerous, forming parallel row along midvein; *indusia narrow, generally hairy*

Rootstock: Long creeping; leaves emanate in closely spaced clumps, with distinct gaps between; scales brown, thin

Human Uses: Unknown

Thelypteris: (Greek) *thelus*—female, *pteris*—fern

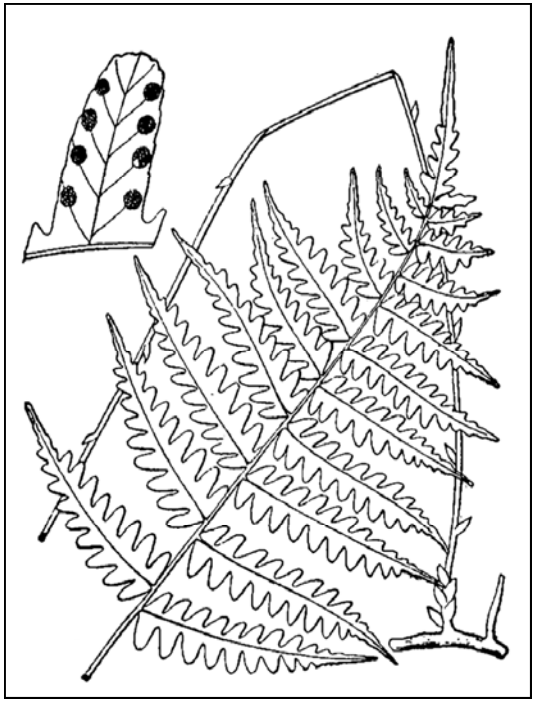
Palustris (Latin): swampy; referring to the preferred habitat of the species

Native: Yes
Evergreen: No

A. Sterile leaflets showing swollen base of costae
B. Fertile leaf with sori
C. Unfurling young leaf
D. Sterile leaf

Bog Fern

Thelypteris simulata



Habitat: Found in acidic swamps and bogs, often growing with sphagnum mosses; in moist to wet shaded woodlands; FACW, found in wetlands (67%-99% of the time)

Population Status: Uncommon in northern NE and NY, becoming more common in MA, CT, and RI

I.D. Notes: Pinnate-pinnatifid; semi taper; *monomorphic*; can resemble *Thelypteris palustris*

Leaf: Up to 2'+/- tall; yellowish-green; tapers to pointed tip

Leaflets: Lower pairs horizontal to rachis; lowest pair widest at middle, tapering toward rachis and leaflet tip; *veins simple*

Rachis: Green; slightly hairy

Petiole: Light brown at base, turning yellowish-green above; shorter than blade; base sparsely scaled

Rootstock: Creeping; black with light brown scales; slender

Sori: Small, round; *indusia curved, with yellowish-orange glands*

Human Uses: Unknown

Thelypteris: (Greek) *thelus*—female, *pteris*—fern

Simulata (Latin): resembling; referring to the resemblance of this species with other ferns, especially *T. palustris*

Native: Yes
Evergreen: No

Gary Fewless

Janet Novak

Janet Novak

A. Sterile leaflets showing simple venation
B. Whole plant
C. Fertile leaflets with developing sori

Alpine Woodsia

Woodsia alpina

Habitat: *At higher elevations*, in cool, damp crevices of limestone or calcareous slates and on talus slopes; in sun or shade

Population Status: Very rare; found only in northern ME, NH, VT and NY; *listed as threatened in ME and endangered in VT and NY*

I.D. Notes: Pinnate-pinnatifid; semi taper; monomorphic

Leaf: Stiff, erect; very narrow—up to ½" +/- wide and short—up to 8" +/- tall; blunt tipped

Leaflets: Blunt, generally cut into 5 lobes; smooth above and scaled and hairy beneath; triangular; *veins forked, not reaching margin; vein tips sometimes swollen*

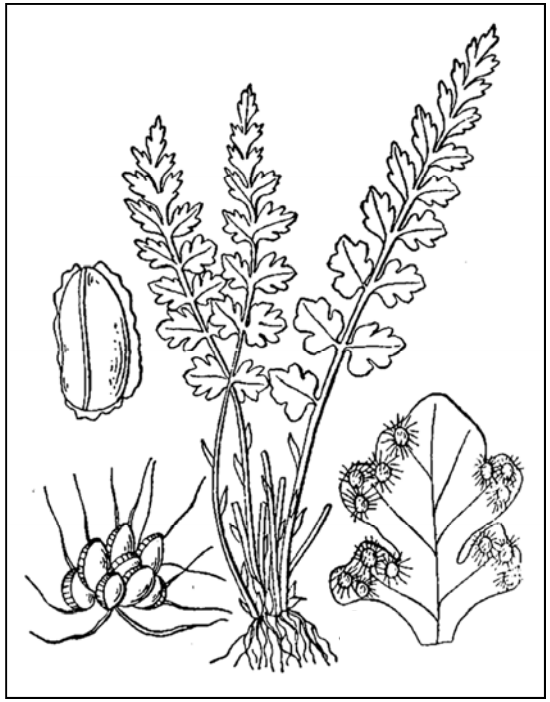
Rachis: Green; few hairs and scales; grooved

Petiole: *Jointed*—petioles broken at joint create stubbly appearance; short; *brown base turning greenish-yellow above*; slightly scaled and slightly hairy

Rootstock: Erect; small, with brown scales

Sori: Located at margin; small, indusia located beneath sori, *with many whitish hair-like structures radiating from center and surrounding sori*

Human Uses: Unknown



Woodsia: named for Joseph Woods, an English Botanist (1776-1864)

Alpina: (Latin) *alpinus*—of the Alps; referring to the mountain habitats this fern is found in

Native: Yes
Evergreen: Yes

Carl Farmer

Carl Farmer

A. Whole plant in limestone crevice
B. Fertile leaflets with hairs radiating from sori
C. Leaf showing grooved, hairy and scaled rachis

Carl Farmer

Smooth Woodsia

Woodsia glabella

Habitat: Found in northern regions, at higher elevations, in shaded limestone crevices of cliffs and rocky banks

Population Status: Very rare; reported in northern NY, NH and ME; scattered in VT; absent from MA, CT and RI; *listed as threatened in ME and endangered in NH and NY*

I.D. Notes: Pinnate-pinnatifid; semi taper; monomorphic

Leaf: Tiny, narrow—½"+/- wide and 6" +/- tall; pointed; light green; fragile

Leaflets: Circular to triangular shaped; generally cut into 2-3 lobes; lower pairs distinctly spaced, becoming more closely spaced toward leaf tip; blunt; *veins forked, not reaching margin; vein tips generally not swollen*

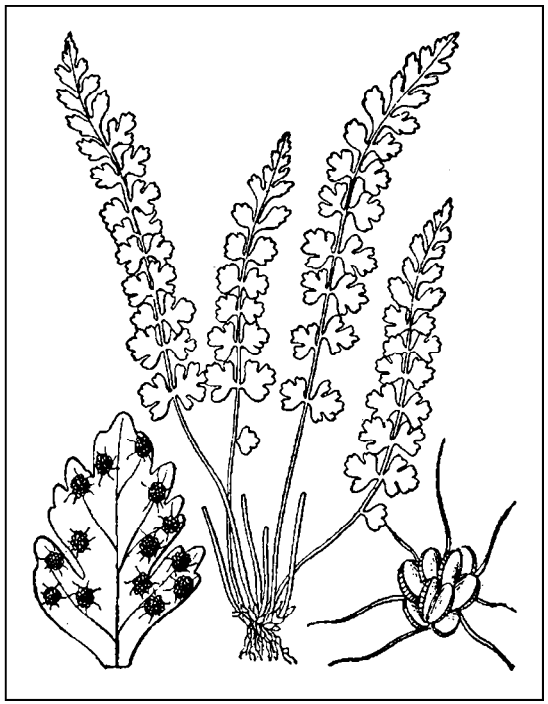
Rachis: Green; smooth

Petiole: *Pale green*; *smooth*; much shorter than blade; *jointed*—petioles broken at joint create stubbly appearance

Rootstock: Very small; erect, with brownish scales

Sori: Small; located near margin; indusia small, located beneath sori, *with few long hairs radiating from the center*

Human Uses: Unknown



Woodsia: named for Joseph Woods, an English Botanist (1776-1864)

Glabella (Latin): smooth; referring to the absence of hairs and scales

Native: Yes
Evergreen: No

Rene Charest

Arthur Haines

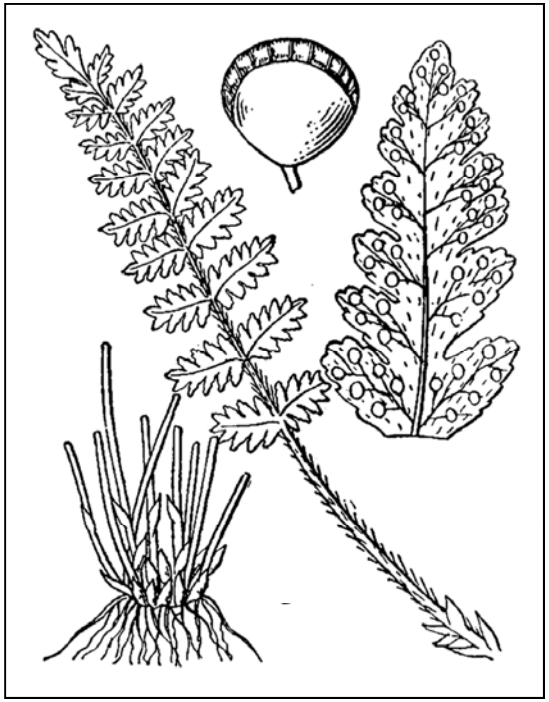
A. Whole plant
B. Whole plant in limestone crevice
C. Fertile leaf
D. Close up of fertile leaflets with hairy sori

Anna-Lena Anderberg

Susan Aiken/Michelle LeBlanc

Rusty Woodsia

Woodsia ilvensis



Habitat: Sun-loving; found in northern, in acidic substrates on exposed ledges and cliffs; also found in well drained, moist soils of rock crevices; absent from limestone

Population Status: Common, widely dispersed throughout NE and NY

I.D. Notes: Pinnate-pinnatifid; semi taper; monomorphic

Leaf: Stiff, erect, and narrow—up to 1" +/- wide and 10" +/- tall; tips blunt or pointed

Leaflets: Blunt; *undersides woolly—with silvery white hairs and scales that turn "rusty" red throughout the growing season*; margin generally curled over, forming a hairy lip; *veins forked, not reaching margin; vein tips swollen*

Rachis: Green; densely hairy and scaled

Petiole: *Jointed*—petioles broken at joint create stubbly appearance; *brownish below, turning green above*; brittle; shining, with hairs and scales

Rootstock: Black to dark brown; erect with many brown scales

Sori: Located under curled margin and well hidden by scales and hair; indusia small, located beneath sori, *with many hair-like structures radiating from margin*

Human Uses: Well suited for a sunny rock garden.

Woodsia: named for Joseph Woods, an English Botanist (1776-1864)

Ilvensis: (Latin) refers to the Mediterranean island Elba

Native: Yes
Evergreen: Yes

Arthur Haines

John Maunder

Janet Novak

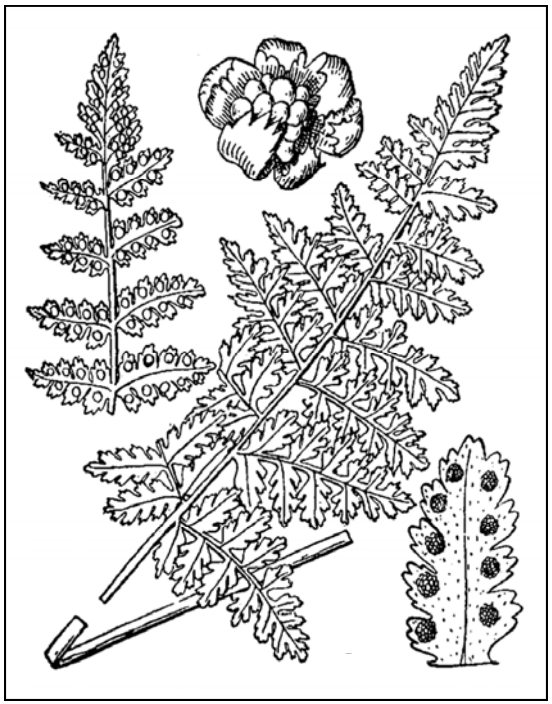
John Maunder

Gary fewless

A. Whole plant on an exposed cliff
B. Young leaves showing whitish wool on undersides of leaflets
C. Older leaves densely covered with “rusty” wool
D. Sterile leaves
E. Fertile lobe with sori covered by scales and hair

Blunt Lobe Cliff Fern

Woodsia obtusa



Habitat: Limestone loving, but does tolerate granite substrates; found on shaded ledges and cliffs, dry to moist woodlands, and along rocky banks

Population Status: Most common *Woodsia* in MA, CT, RI, NY and VT; rare in northern areas of NH and ME; *listed as threatened in ME and endangered in NH*

I.D. Notes: Bipinnate; semi-tapering; monomorphic

Leaf: Up to 2' +/- tall; erect, slightly arched

Leaflets: Widely spaced, especially at base of rachis; *glandular on upper and lower surfaces and along the costae*; tips rounded, blunt; lowest pair distinctly smaller and triangular; margin of leafules serrated; *veins forked, not reaching margin; vein tips often swollen*

Rachis: Pale yellow to brown; *mushroom-like glands* and scaled

Petiole: *Dark orange at base, turning pale yellow above*; densely scaled and hairy; brittle—broken off petioles (at various heights) persist and create stubbly appearance; some scales reddish-brown with dark centers

Rootstock: Short, dark brownish-black; erect; scaly

Sori: In rows scattered along margin; becoming closer together as sori mature; indusia located beneath the sori, *with 5-6 glandular flaps forming star-like structure*

Human Uses: Unknown

Woodsia: named for Joseph Woods, an English Botanist (1776-1864)

Obtusa: (Latin) *obtusus*—blunt; referring to the blunt tips of leaflets

Native: Yes
Evergreen: Yes

Woodsia obtusa

Janet Novak

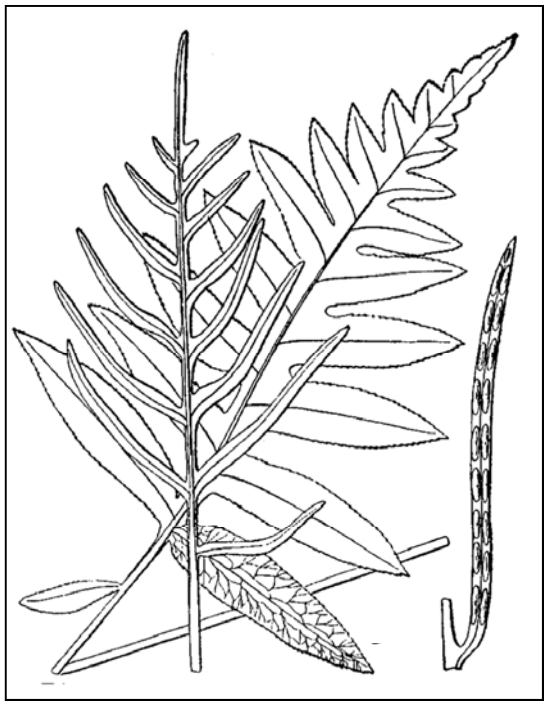
Kitty Kohout

Thomas Barnes

A. Leaves showing erect posture and horizontal leaflets
B. Fertile leaflet with whitish indusia flaps and showing glandular rachis
C. Whole plant

Netted Chain Fern

Woodwardia areolata



Habitat: Shade and sun loving; found in bogs, swamps and wet woodlands, often rooted in mud; *most common along the coast*; survives in very acidic to circumneutral to sub-alkaline substrates; FACW+, usually more frequently found in wetlands than not (67%-99% of the time)

Population Status: Found along NE coastal plain; in southeastern NY; rare in southern ME, NH, and western MA; *listed as endangered in NH*

I.D. Notes: Pinnatifid; semi taper; *strongly dimorphic*; can resemble *Onoclea sensibilis*

Sterile Leaf: Up to 2'+/- tall; twisting and arching; tip pointed; shiny

Segments: Lowest pair usually stemmed, creating leaflets that are *distinctly alternate and tilting horizontal to rachis*; narrow, with wavy, *finely serrated margin*; veins netted, especially at costae

Rachis: *Slightly scaled on underside*, olive-green to straw-colored

Petiole: Generally longer then blade; dark reddish-brown at base, yellowish-green above; with scales; flattened and slightly grooved

Fertile Leaf: Arising in summer, usually taller than sterile leaves; lowest pairs stemmed, creating leaflets, upper pairs winged; segments are distinctly narrower; petiole and rachis dark purplish-brown

Sori: Oblong; found along costae of leaflets, in two parallel, chain-linked rows; *indusia membranous, entirely covering sori; indusia disintegrates over time, rather than opening as with most ferns*

Rootstock: Long creeping and forking; dark brown to black

Human Uses: Unknown

Woodwardia: named for Thomas J. Woodward, an English Botanist (1745-1820)

Areolata: (Latin) *areolatus*—a small place; referring to the area of leaflets enclosed within the netted veins

Native: Yes
Evergreen: No

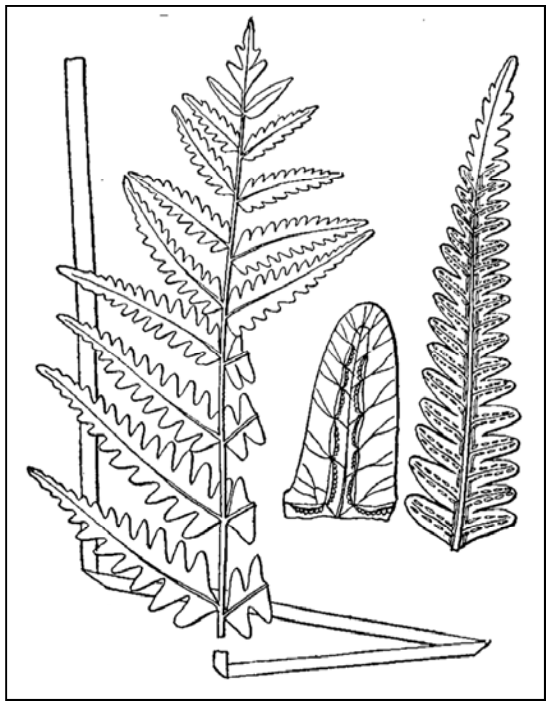
Woodwardia areolata

A. Fertile leaf (on left) and sterile leaf (on right)
B. Sterile segments with netted venation and finely serrated margin
C. Fertile leaf showing membranous indusia

Amy Richard

Virginia Chain Fern

Woodwardia virginica



Habitat: *Water-loving*, with roots usually in standing waters of shaded to sunny acidic swamps, bogs, and saturated areas of forests; *OBL*, occurring always in wetlands (>99% of the time)

Population Status: Common; reported throughout NY and NE, especially along the coastal plain; *listed as threatened in VT*

I.D. notes: Pinnate-pinnatifid; semi taper; monomorphic; can resemble *Osmunda cinnamomea*

Leaf: Dark green, turning deep brownish-red in autumn; leathery, coarse texture; can become quite tall—up to 4' +/-

Leaflets: *Lowest pair widest at middle, tapering toward rachis and leaflet tip*; point upward; *chain-like, netted venation along costae, otherwise veins forked*; sometimes with yellowish glands; lobes point slightly forward; upper costae raised and grooved

Rachis: Dark purple-brown turning green above; smooth and shiny, with *slightly raised ridges at base of costae*; grooved

Petiole: Dark, shiny purple-brown; *distinctly swollen base*; deeply grooved; twice or more the length of the blade; scales dark tan to brown

Rootstock: Long creeping; dark brown to black; thick, with few brownish scales

Sori: Dark brown; *forming chain-like pattern*, in parallel rows along costae and midveins; takes up majority of the underside; indusia dark brown

Human Uses: Unknown

Woodwardia: named for Thomas J. Woodward, an English Botanist (1745-1820)

Virginica: (Latin) of Virginia; referring to the collection source of the specimens

Native: Yes
Evergreen: No

A. Leaflet with netted venation
B. Fertile leaflet with sori
C. Whole plant in boggy habitat

Janet Novak

Glossary

ANTHERIDIUM (pl. IA): The male reproductive structure of fern gametophytes.

APOGAMY: Form of asexual reproduction in which a new sporophyte grows directly from the tissue of the gametophyte, rather than from a fertilized egg cell.

AREOLA (pl. EA, AS): A small, well defined area bounded by the netted veins of some leaflets (see *Woodwardia* species, pgs. 134-136).

ARCHEGONIUM (pl. IA): The female reproductive structure of fern gametophytes.

AXIL: The point of the upper angle formed between the axis of a stem and the leaflet arising from it.

AXIS (pl. ES): The longitudinal, central supporting structure from which parts of a plant are borne.

BIPINNATE: A leaf with leaflets divided into leafules—twice pinnate

BIPINNATE-PINNATIFID: A leaf with leafules deeply lobed, but not further divided into leafulets.

BLADE: The broad part of a leaf

BRISTLE TIPS: A short hair or hair-like structure emanating from the tip of leafules.

BULBLET: A small bulb, created asexually and borne above the ground (see *Cystopteris bulbifera* on pg. 58).

CALCAREOUS: Referring to bedrock or soil high in the mineral calcium (lime).

COSTA (pl. AE): The midvein of a leaflet.

CREEPING: Growing along the surface of the ground or just beneath the surface, and producing roots, usually at the nodes.

DECIDUOUS: A fern that dies back or falls off at the end of the growing season—not evergreen.

DIMORPHIC: A fern with two forms—sterile and fertile leaves being different forms.

ECO-INDICATOR: A fern used to identify a specific environment (i.e. an acidic wetland).

ENTIRE: With a continuous margin—not toothed, notched or divided.

EPIPETRIC: Growing on rocks.

EVERGREEN: A fern that remains green throughout the winter.

FERTILE: Capable of sexual reproduction.

FIDDLEHEAD (syn. CROZIER): The unfurling young leaf; refers to the curled end of a fiddle/violin.

LEAF: An expanded photosynthetic organ of a plant—the entire above ground fern plant, including the petiole, blade, and rachis.

GAMETOPHYTE: The haploid, gamete producing generation of the plant reproductive cycle.

GLANDULAR: Of or pertaining to a gland; bearing glands.

HABITAT: The physical environment in which an organism lives.

HAIR: A thin projection, only one cell thick, growing out of the epidermis of various plant structures—not as stiff or stout as a bristle or spine.

INDUSIUM (pl. IA): A thin epidermal outgrowth (flap of tissue) that covers and protects the sorus.

LIMEY: Containing high concentrations of limestone—referring to bedrock or soils.

LOBE: A rounded division projecting from the margin of a blade, leaflet or leafule.

MARGIN: The edge, as in the edge of a leaflet or leafule.

MESIC: Moderately moist habitat.

MIDVEIN: The central vein or axis of a leaf, leaflet, or leafule.

MONOMORPHIC: A fern with one form—sterile and fertile leaves being of the same form.

MORPHOLOGY: The study of form.

NETTED VEINS: Veins that form complex networks—not extending freely or forked.

PETIOLE: The stalked portion of the leaf arising from the rootstock that ends at the point where the blade is produced.

LEAFLET (pl. AE): The primary segment of a blade that is fully divided to the rachis.

PINNATE: A leaf fully divided into stemmed leaflets.

PINNATE-PINNATIFID: The leaflets are deeply lobed, but not fully divided into leafules.

PINNATIFID: Blade is deeply cut toward rachis creating primary segments that are not stemmed to the rachis.

LEAFULE: The primary segment of a leaflet that is fully divided and stemmed to the costa.

LEAFULET: The primary segment of a leafule that is fully divided and stemmed to the midvein of the leafule.

PROSTRATE: Lying flat on the ground.

PTERIDOLOGIST: One who studies ferns.

PTERIDOPHYTE: Vascular plants that reproduce via spores, including ferns and related plants such as club mosses and horsetails.

RACHIS: The main axis of the blade.

ROOTSTOCK (syn. RHIZOME): A horizontal underground stem.

SCALE: A tiny, flat, papery, thin, dry, membranous structure.

SEEPAGE: A spot where water trickles from the ground to form a pool.

SERRATE: Saw-like; toothed along the margin.

SIMPLE: Undivided—not divided into leaflets or leafules; veins not forked.

SORUS (pl. I): A cluster of sporangia.

SPORANGIUM (pl. IA): A spore bearing case or sac.

SPORE: A reproductive cell resulting from meiotic cell division in a sporangium, which gives rise to the gametophyte.

SPOROPHYTE: The diploid, spore producing generation of the plant reproductive cycle.

STERILE: Infertile; without sporangia.

TALUS: Rock debris deposited by erosion, usually found at the base of a cliff.

TOOTHED: Toothed along the margin—without a continuous margin.

TRIPINNATE: A leaf with leaflets divided into leafules, which are then divided into leafulets—thrice pinnate.

VASCULAR BUNDLE: A cluster or group of vascular tissues.

VEIN: A vascular bundle, usually visible externally.

WINGED: Possessing a thin, flat tissue bordering or extending from a structure (see *Phegopteris* species pgs. 104-106).

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Appendix A

Excluded Taxa

Adiantum aleuticum
Western Maidenhair Fern

Adiantum viridimontanum
Green Mountain Maidenhair Fern

Asplenium bradleyi
Bradley's Spleenwort

Asplenium ebenoides
Scott's Spleenwort

Cystopteris laurentiana
Laurentian Bulblet Fern

Cystopteris tenuis
Mackay's Fragile Fern

Dryopteris celsa
Log Fern

Gymnocarpium jessoense
Asian Oak fern

Pellaea glabella
Smooth Cliff Brake

Polystichum lonchitis
Northern Holly Fern