

Illustrated FERNS and LYCOPHYTES

of the Chicago Region

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The identification of ferns can be a frustrating task, even with the aid of the few illustrated reference floras, some listed below, that include the Chicago Region within their scope. The Chicago Region here includes the 22 counties detailed in Wilhelm & Rericha (2017), which is the source for the key to the genera included here. Indeed, we recommend that they be used along with this treatment, with the understanding that there will be nomenclatural and taxonomic differences among reference materials. One can always go online, but caution is recommended, since online illustrations and photographs may not represent consistent thinking with regard to taxonomy. Nor can one be sure that the image presented is a good or even accurate representation of the species.

One might imagine that photographs would represent a species most accurately, but due to the vagaries of focal plane, choice of subject, and several other factors, individual photographs may not provide the student with a succinct impression. Line illustrations, for the purposes of species identification, can emphasize the singular features of a species insofar as it compares to related species. We have made every effort to do so here. It is our hope that this presentation of local ferns and other vascular cryptogams will enable anyone with a hand lens and an interest in the flora to become acquainted with this lovely but challenging group of ancient plants.

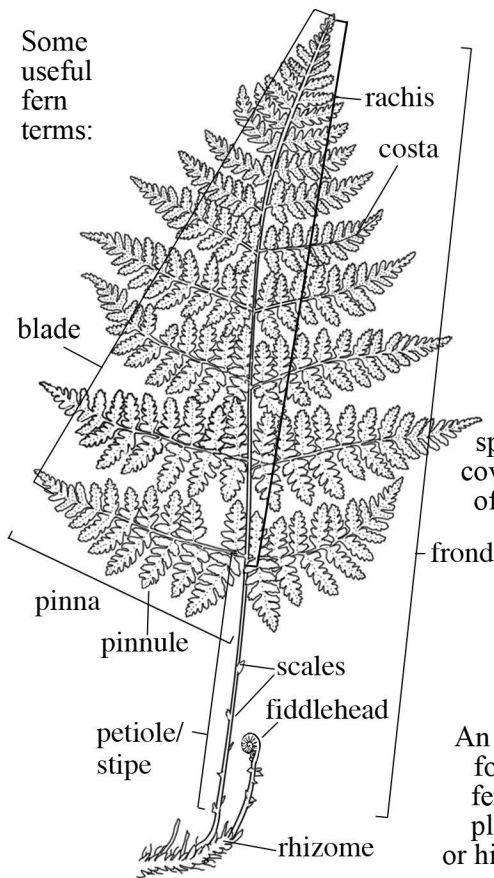
Few efforts of quality are achieved in isolation. Fern expert Robbin Moran, Curator Emeritus, New York Botanical Garden, provided very helpful comments on the illustrations of ferns and lycophytes, and on the accompanying text. We are grateful to Bill N. McKnight, special publications editor of the Indiana Academy of Science, for his ongoing support and guidance on clubmosses. The senior author would also like to express her gratitude to Jack Shouba, who taught her the joy of learning trees in all seasons in his Morton Arboretum classes, with the help of a good dichotomous key, and whose careful eye made sure there were no omissions in this manuscript. Last but not least, her son Ian James Halliday, who, with his family, Katy, Liam and Ellie, always have given steadfast encouragement in her artistic efforts (and frequent IT help too).

Recommended Illustrated References

- Billington, C. 1952. Ferns of Michigan. Bloomfield Hills: Cranbrook Institute of Science
- Mohlenbrock, R. H. 1967. The illustrated flora of Illinois: Ferns. Carbondale: Southern Illinois University.
- Moran, R. C. 2004. A natural history of ferns. Portland, Oregon: Timber Press.
- Palmer, D. D. 2018. Michigan ferns and lycophytes: a guide to species of the Great Lakes region. Ann Arbor: University of Michigan.
- Wilhelm, G. and L. Rericha. 2017. Flora of the Chicago region: a floristic and ecological synthesis. Indianapolis: Indiana Academy of Science.

Ferns and Lycophytes of the Chicago Region

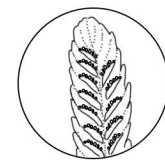
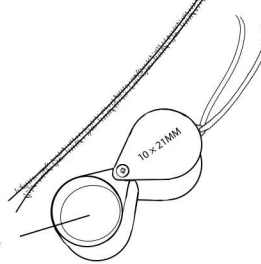
Some useful fern terms:



The fractal geometry of ferns has inspired artists and scientists to look more closely! Ferns and other vascular cryptogams are some of the most ancient vascular plants on earth.

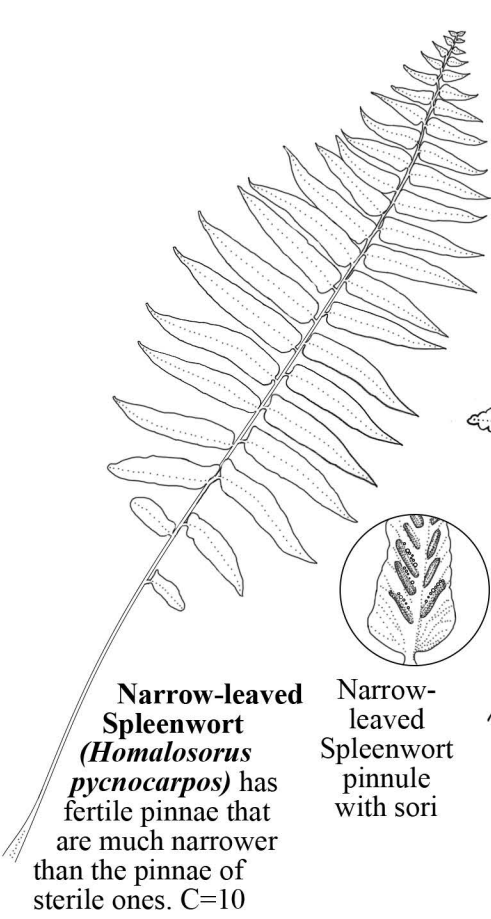
Ferns and lycophytes are vascular plants that disperse by tiny dust-like spores. In ferns, sori are clusters of spore-producing structures, often covered with an indusium, the form of which is generally significant.

An essential tool for identifying ferns and other plants is a 10X or higher hand lens.



Silvery Spleenwort pinnule with sori

Silvery Spleenwort (*Deparia acrostichoides*) has a very hairy stipe and 'eyebrow-shaped' (some say 'taco-shaped!') sori. Rare, it might be found in ravines, rich mesic woodlands. Much of its habitat has been destroyed. C=10



Narrow-leaved Spleenwort (*Homalosorus pycnocarpus*) has fertile pinnae that are much narrower than the pinnae of sterile ones. C=10

Narrow-leaved Spleenwort pinnule with sori



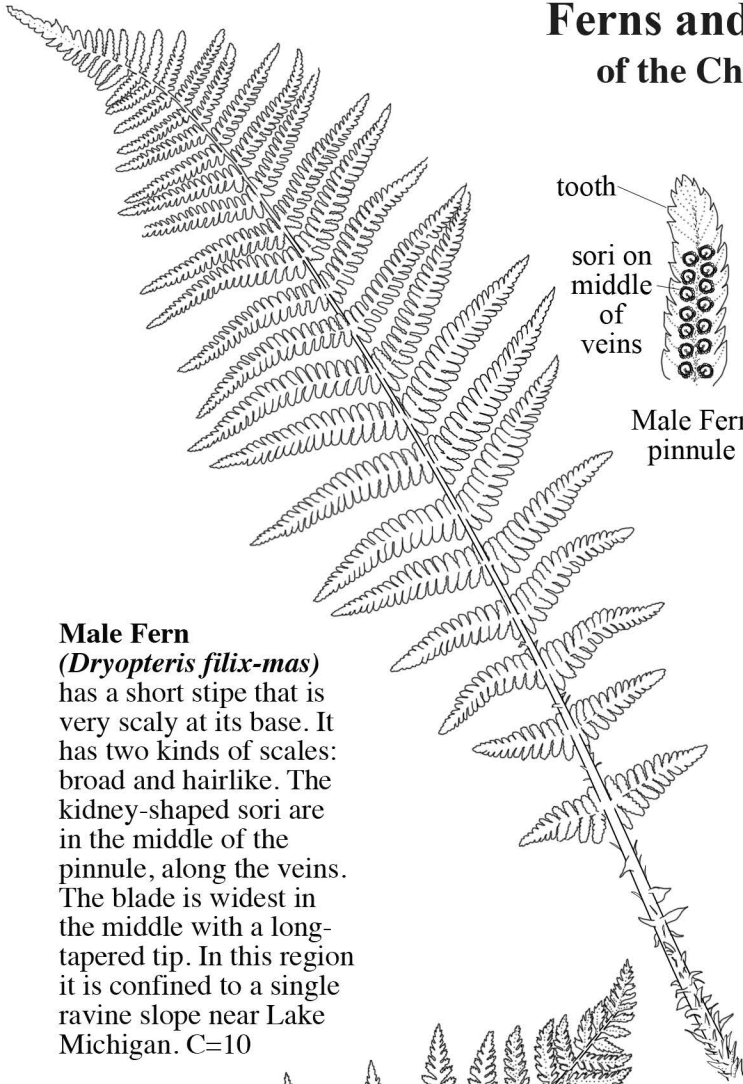
Sensitive Fern (*Onoclea sensibilis*) is most common in wetter areas such as marshes and wet prairies and flatwoods. Notice the bead-like appearance of the fertile frond, which will remain long after the sterile frond has disappeared. It is also distinctive for its netted veins. The common name refers to the rapid discoloration of the frond at the first frost. See also comments on Netted Chain Fern, plate 5. C=5



Lady Fern pinnule with sori

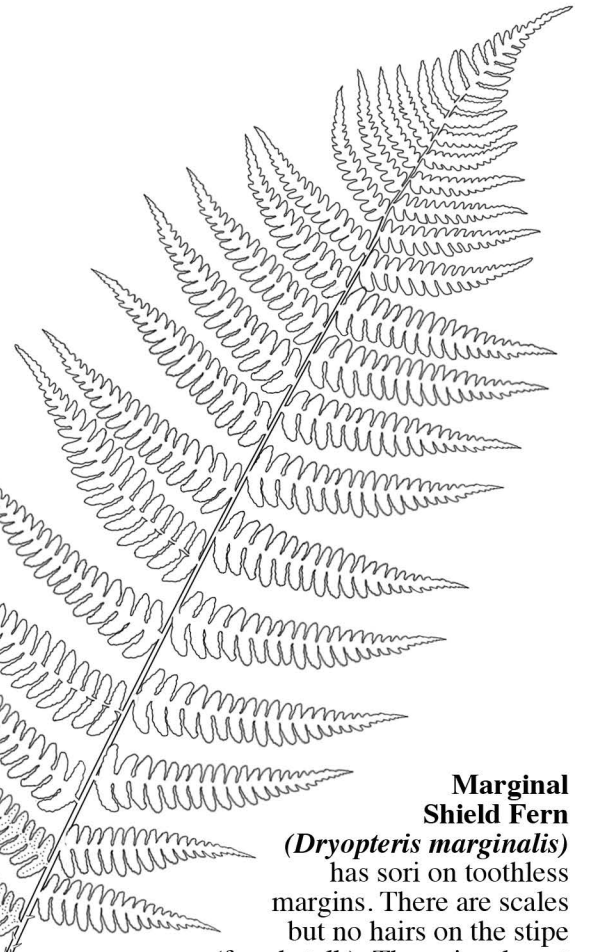
Lady Fern (*Athyrium filix-femina*) is probably the most common fern in our woodlands. It grows in small vase-shaped clusters. Sori resemble eyebrows, and can be straight or with a slight arch. C=8

Ferns and Lycophytes of the Chicago Region



tooth
sori on middle of veins
Male Fern pinnule

sori on margins
Marginal Shield Fern pinnule



Marginal Shield Fern
(*Dryopteris marginalis*)
has sori on toothless margins. There are scales but no hairs on the stipe (frond stalk). The veins do not reach the edge of the blade. It is confined to rich mesic woods. C=10

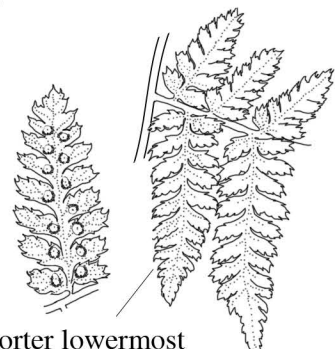
Male Fern
(*Dryopteris filix-mas*)
has a short stipe that is very scaly at its base. It has two kinds of scales: broad and hairlike. The kidney-shaped sori are in the middle of the pinnule, along the veins. The blade is widest in the middle with a long-tapered tip. In this region it is confined to a single ravine slope near Lake Michigan. C=10



note longer lowermost pinnule closest to the rachis
Spinulose Shield Fern with sori.



capitulate gland

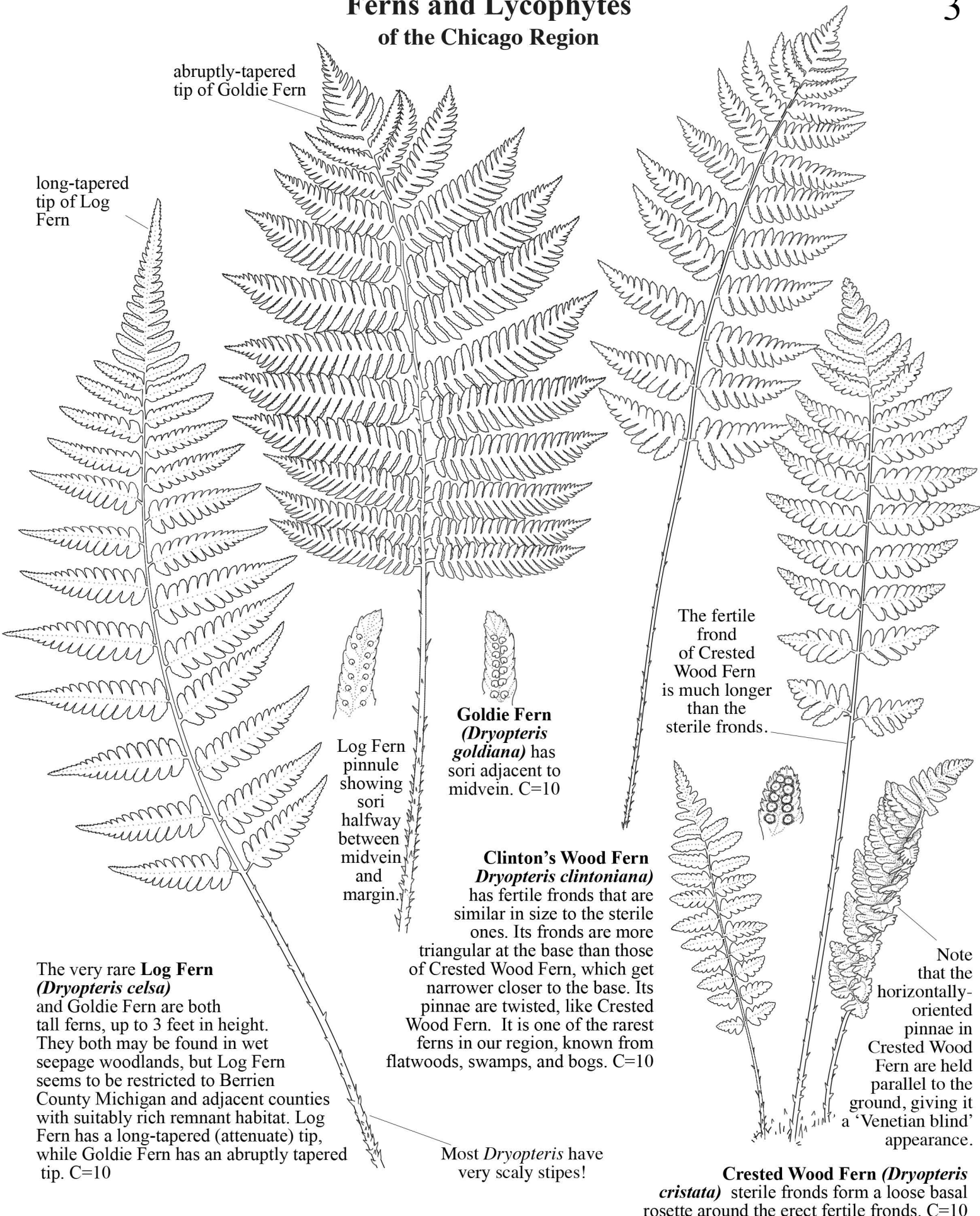


shorter lowermost pinnule closest to the rachis
Florist's Wood Fern with sori

Spinulose Shield Fern (*Dryopteris carthusiana*) has a very scaly stipe, kidney-shaped sori, and no glands on the indusia. The lowermost segment of each pinnule is longer than the one above it. C=8

Sori on **Florist's Wood Fern** (*Dryopteris intermedia*) are round or kidney-shaped. Its indusia and rachis have visible capitulate glands but you need a hand lens to see them. The best field character to tell this one from Spinulose Shield Fern is that in Florist's Wood Fern, the lowermost segment of each pinnule is shorter than or equal to the one above it whereas in Spinulose Shield Fern, it is longer. C=9

Ferns and Lycophytes of the Chicago Region



abruptly-tapered tip of Goldie Fern

long-tapered tip of Log Fern

The fertile frond of Crested Wood Fern is much longer than the sterile fronds.

Log Fern pinnule showing sori halfway between midvein and margin.

Goldie Fern (*Dryopteris goldiana*) has sori adjacent to midvein. C=10

Clinton's Wood Fern (*Dryopteris clintoniana*) has fertile fronds that are similar in size to the sterile ones. Its fronds are more triangular at the base than those of Crested Wood Fern, which get narrower closer to the base. Its pinnae are twisted, like Crested Wood Fern. It is one of the rarest ferns in our region, known from flatwoods, swamps, and bogs. C=10

Note that the horizontally-oriented pinnae in Crested Wood Fern are held parallel to the ground, giving it a 'Venetian blind' appearance.

The very rare **Log Fern (*Dryopteris celsa*)** and Goldie Fern are both tall ferns, up to 3 feet in height. They both may be found in wet seepage woodlands, but Log Fern seems to be restricted to Berrien County Michigan and adjacent counties with suitably rich remnant habitat. Log Fern has a long-tapered (attenuate) tip, while Goldie Fern has an abruptly tapered tip. C=10

Most *Dryopteris* have very scaly stipes!

Crested Wood Fern (*Dryopteris cristata*) sterile fronds form a loose basal rosette around the erect fertile fronds. C=10

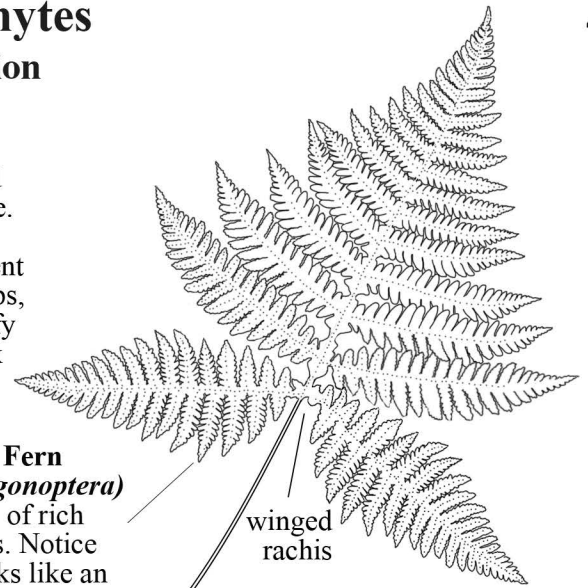
Ferns and Lycophytes of the Chicago Region

The ferns on this page mostly have rounded tips on the pinnules and a smooth, not scaly, stipe.

The shape and arrangement of fronds, sori, pinnule tips, and venation help identify ferns to species, so look closely at those.



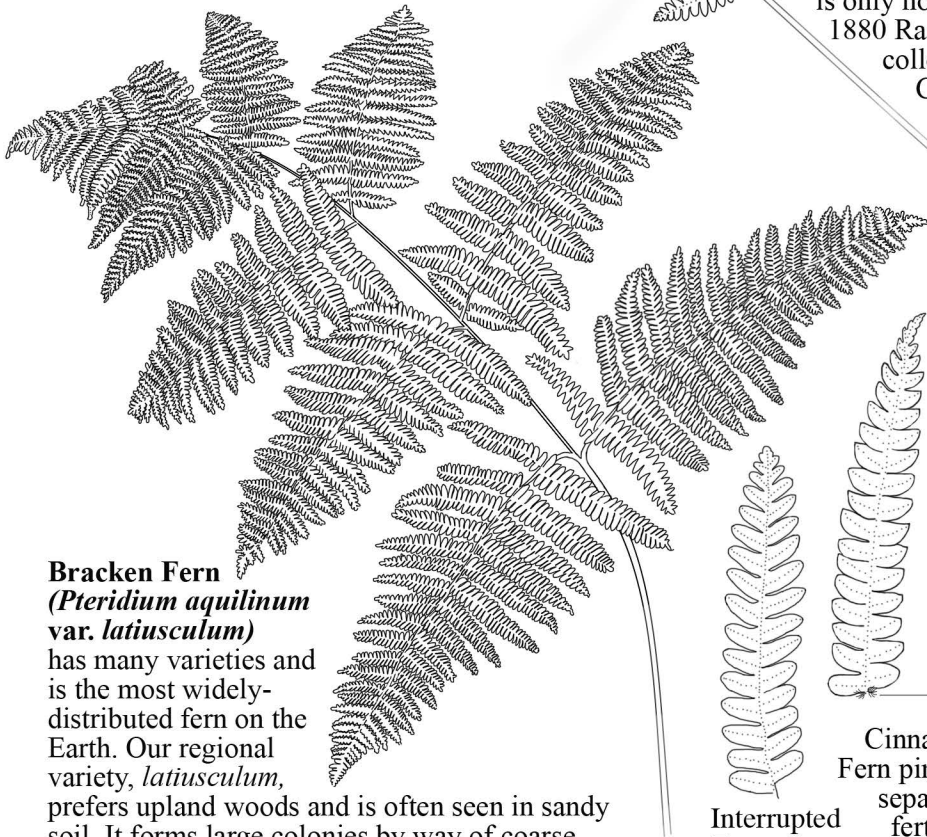
Interrupted Fern (*Osmunda claytoniana*) is so called because the spore-bearing pinnae 'interrupt' the normal aspect of the frond, with sterile pinnae both above and below. Notice the evenly rounded, not pointed, pinnules common to all *Osmunda* species. C=8



Broad Beech Fern (*Phegopteris hexagonoptera*) is a rare species of rich mesic woodlands. Notice how it almost looks like an equilateral triangle. The winged rachis is very distinctive to this species. C=10

winged rachis

Oak Fern (*Gymnocarpium dryopteris*), which also has a triangular aspect but no winged rachis, is only noted from one 1880 Racine Co. WI collection). C=10



Bracken Fern (*Pteridium aquilinum* var. *latiusculum*) has many varieties and is the most widely-distributed fern on the Earth. Our regional variety, *latiusculum*, prefers upland woods and is often seen in sandy soil. It forms large colonies by way of coarse, hairy rhizomes. Glands at the top of the petiole and the base of the pinnae contain sugars that attract territorial ants. The glands at the pinna bases (lower side) often appear as dark spots, especially after they have stopped producing nectar. The blade is held high and almost parallel to the ground. C=5

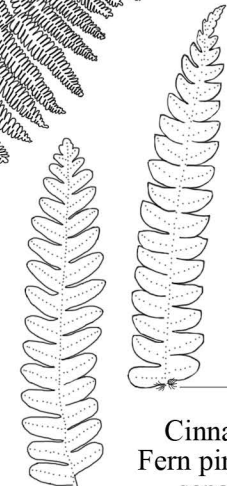
There is one Jasper Co. Indiana record for the more southern variety, *pseudocaudatum*.



Notice the tufts of hairs here at the base of the pinna, on the abaxial surface.

Cinnamon Fern

(*Osmundastrum cinnamomeum*) can be tricky to tell apart from Interrupted Fern when they're not reproductive. Look closely at the different shapes of the pinnules. Cinnamon Fern's point upward, and the end of each pinna is sharp rather than blunt. Also look for tufts of hair where the pinnae meet the rachis. The sterile and fertile fronds look very different. C=8



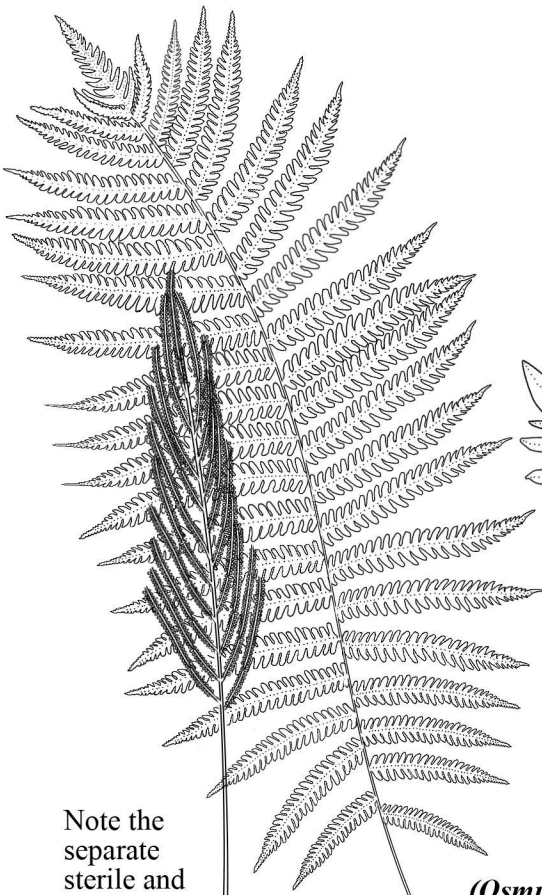
Interrupted Fern pinna

Cinnamon Fern pinna and separate fertile frond

Glands and hair tufts (respectively) are located on the abaxial (lower) surface of the leaves so look closely for those too.

Ferns and Lycophytes of the Chicago Region

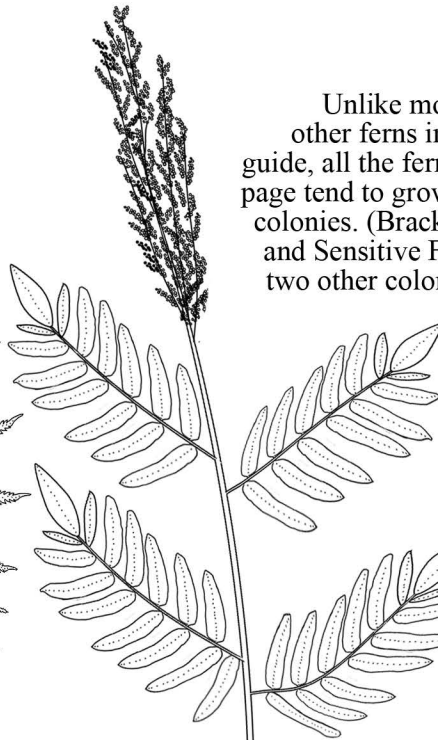
Unlike most other ferns in this guide, all the ferns on this page tend to grow in large colonies. (Bracken Fern and Sensitive Fern are two other colonizers.)



Note the separate sterile and fertile fronds on Ostrich Fern.

Ostrich Fern (*Matteuccia struthiopteris*) is commonly cultivated. C=10

fertile frond



Royal Fern (*Osmunda spectabilis*) is found in bogs and wet sand prairies. The fertile pinnae are at the top of the frond. Its Latin name 'spectabilis' means showy. C=8



Virginia Chain Fern (*Woodwardia virginica*) C=10

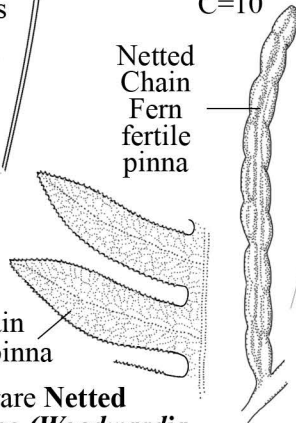
Pinna segment of Virginia Chain Fern shows 'chainlike' arrangement of sori. Notice how they're parallel to the main vein as well as on the lobes.



Marsh Shield Fern fertile pinnule

sterile pinnule with forked veins

Marsh Shield Fern (*Thelypteris palustris*) can be distinguished from New York Fern by the forked veins on the pinnae. It is very delicate, almost like tissue paper. It also tends to occupy wetter habitats. Look for it in sunny prairies and sedge meadows. C=7



Netted Chain Fern sterile pinna

The rare **Netted Chain Fern (*Woodwardia areolata*)** resembles Sensitive Fern in its netted veins and pinnatifid fronds, but differs in that the fertile pinnae do not form bead-like sori; rather they are very long and narrow. C=10

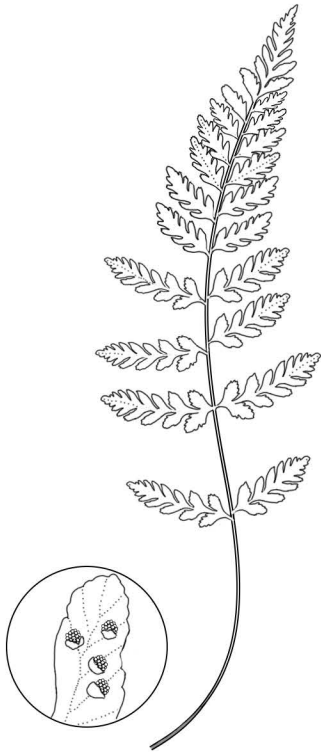
New York Fern has kidney-shaped indusia on its fertile pinnae; the veins are not usually forked.



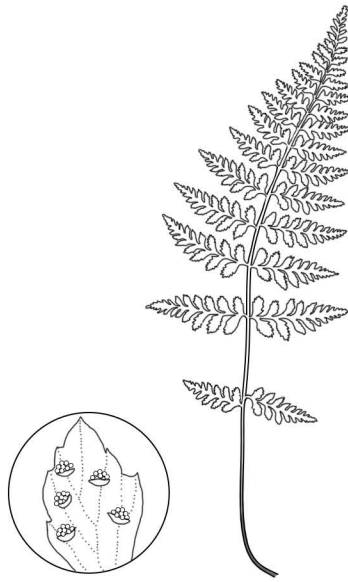
New York Fern (*Thelypteris noveboracensis*) only grows in shaded high-quality woodlands in our eastern sector. It is a very delicate-looking fern, even more so than Marsh Shield Fern. The blade is gradually reduced toward the base to tiny pinnae. C=10

Ferns and Lycophytes of the Chicago Region

The species in this top row will only be found on rocky outcrops in canyons in our region. The species in the bottom row are occasionally also found in rocky woodlands.



Tennessee Fragile Fern (*Cystopteris tennesseensis*) has minute stipitate glands that you will need a good magnifier to see. The scalelike indusium is attached on one side of the vein, which is characteristic of *Cystopteris*. Sometimes it forms small scaly bulblets along the rachis where it is joined by the pinnae. Compared to *C. bulbifera*, the bulblets are much smaller and scallier. Even small fronds tend to have sori! C=10

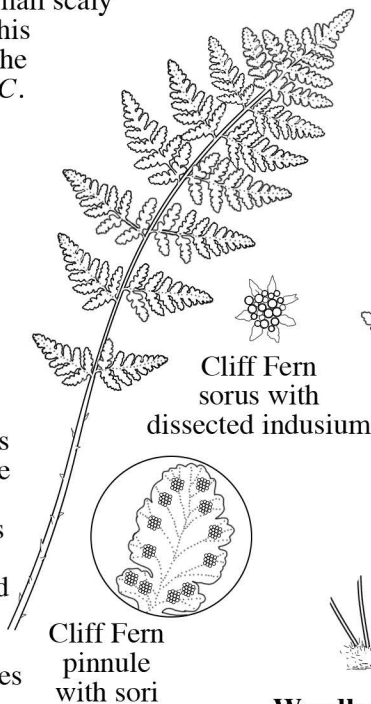


Fragile Fern (*Cystopteris fragilis*) Look for the dark stipe and pinnae that are perpendicular to it, and don't curve upward. Its pinnules have sharp 'teeth' whereas the others do not. C=10



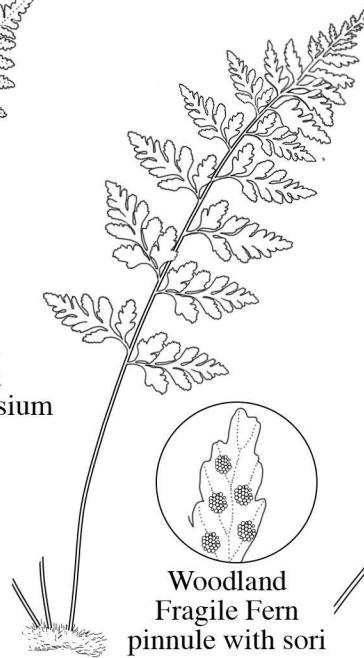
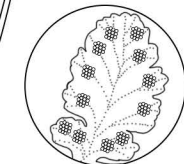
Slender Fragile Fern (*Cystopteris tenuis*) has dark brown shading on its stipe that reaches well above the middle. Notice how the pinnae arch upwards. The pinnules are wedge-shaped at the base and often blunt at the tips. They are also more ascending than the others. Look for it in moist limestone-rich woodlands and rocky ravines. C=10

Cliff Fern (*Woodsia obtusa*) The presence of scales on the laminae and the form of the indusium are the best characters to distinguish it from *Cystopteris*. The frond is broadest near the middle. The tips of the pinnae and pinnules are blunt. The indusia split to form star-like membranes. It is rare on wooded rocky cliffs in our region. C=10



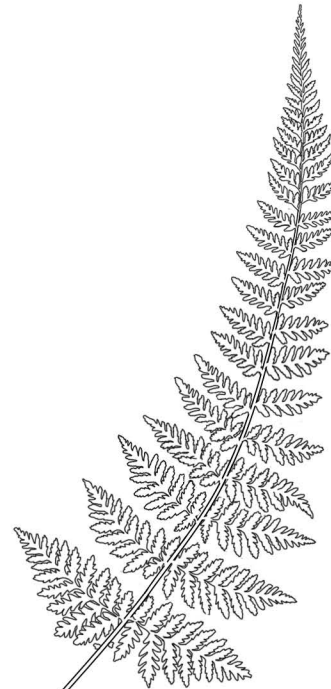
Cliff Fern pinnule with sori

Cliff Fern sorus with dissected indusium



Woodland Fragile Fern pinnule with sori

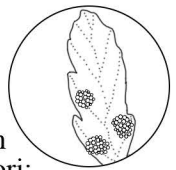
Woodland Fragile Fern (*Cystopteris protrusa*), like others in its genus, has fronds that are thin and delicate. It is the only one of our species with rhizomes that protrude beyond the current year's cluster of leaves. The rhizomes are also pubescent with fine yellow hairs. C=8



Bladder Fern pinnule with sori:

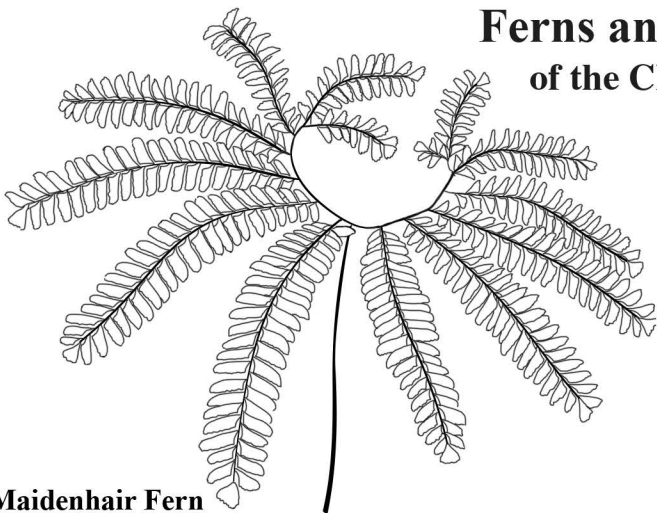


pinna showing bulblet along costa

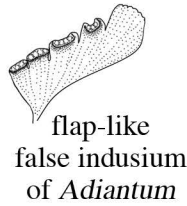


Bladder Fern (*Cystopteris bulbifera*) gets its name from the tiny bulblets borne on the underside of some of the pinnae. These bulblets fall off and develop into new plants that are clones of their parent. Newly emerging fronds have bright red stems! Look for it on the walls of dolomite canyons and in calcareous woodlands in our region. C=10

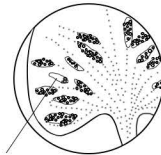
Ferns and Lycophytes of the Chicago Region



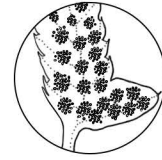
Maidenhair Fern
(*Adiantum pedatum*) is distinct from other ferns in that the lobes of the pinnae cover the sori. It's the only fern in our area that has its rachis divide at the top into the 'C' shape you see here. Note the very dark, almost black rachis! C=10.



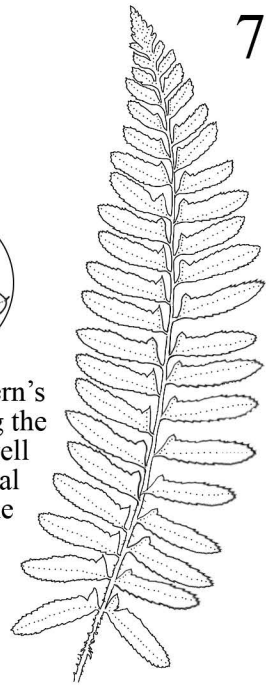
flap-like false indusium of *Adiantum*



Walking Fern sporangia are underneath translucent indusia.

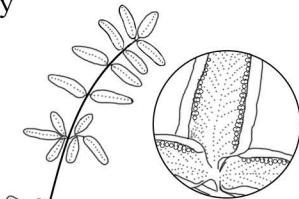


Christmas Fern's sori are along the midrib as well as the lateral veins of the pinnules.



Adder's Tongue Fern
(*Ophioglossum pusillum*) has its sori along a stalk that overtops the small leaf. It is the only one of our ferns that lacks a midrib (costa). Look for it in wet-mesic sand prairies and sandy sedge meadows. C=9

Purple Cliffbrake
(*Pellaea glabella*) lives on partially-shaded limestone outcrops. C=10



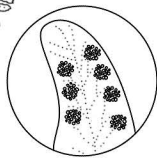
Purple Cliffbrake sporangia are under the rolled leaflet margins.

Walking Fern
(*Asplenium rhizophyllum*) has the interesting characteristic of being able to make new plants from the tips of its fronds! Look for it on dolomite boulders and ledges in our canyons. C=10

Christmas Fern
(*Polystichum acrostichoides*) has a little 'ear' or lobe at the top of each pinna, next to the scaly rachis. The evergreen fronds have a leathery texture and the pinnae have spinulose margins. The fertile pinnae are always located near the tips of the frond. The common name comes from the fronds' persistence into December. C=8



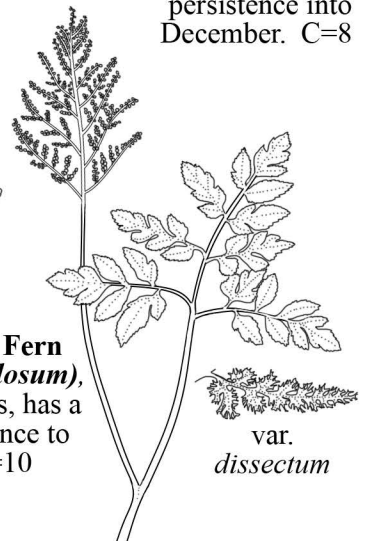
Ebony Spleenwort pinna



Polypody
(*Polypodium virginianum*) may be found on rock cliffs or at the bases of trees in rich mesic woodlands. The fronds are evergreen, persisting over the winter. The creeping rhizome is very scaly. C=10

Rattlesnake Fern (*Botrypus virginianus*) The spore-bearing stalk emerges from the base of the frond's blade. Look for it in mesic woodlands and savannas. C=5

Wrinkled Grape Fern
(*Sceptridium rugulosum*), as its name implies, has a wrinkled appearance to the fronds. C=10



Cut-leaved Grape Fern
(*Sceptridium dissectum*) has two varieties in our region: one with very dissected pinnae and one without. Leaf segments are acute and flat. (The frond on the left is the fertile frond with the sporangia.) C=5

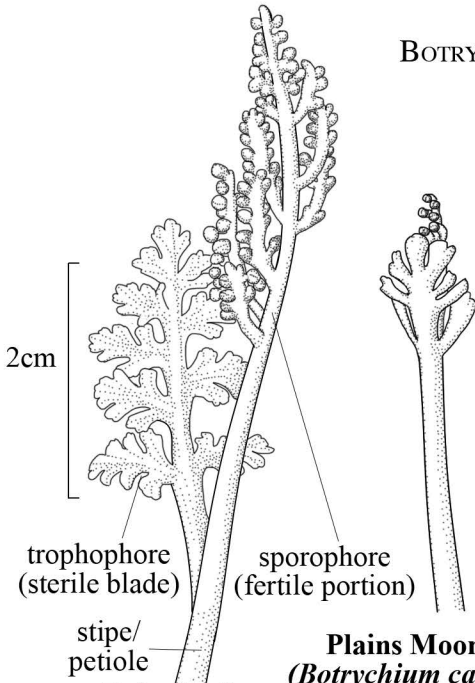
Ebony Spleenwort
(*Asplenium platyneuron*) has a distinctive black rachis. It can be found in sandy upland woods and pine plantations. C=3

Leathery Grape Fern
(*Sceptridium multifidum*) has blunt segments, each about as long as wide. C=10

Blunt-lobed Grape Fern
(*Sceptridium oneidense*) has blunt segments, the terminal ones longer than wide. C=5

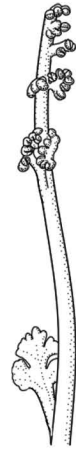
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BOTRYCHIUMS:



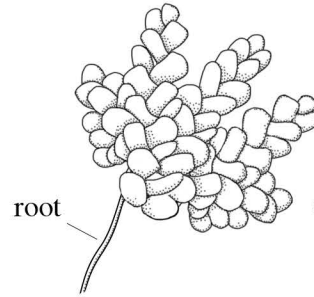
trophophore (sterile blade)
sporophore (fertile portion)
stipe/
petiole
Daisy-leaf Moonwort
(*Botrychium matricariifolium*)
is the only grape fern that is twice-pinnate.
C=4

Plains Moonwort
(*Botrychium campestre*)
is distinctive in that its small trophophore and short sporophore are both atop the long stipe. C=0

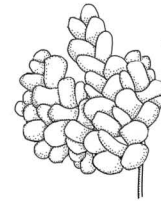


Dwarf Grape Fern
(*Botrychium simplex*) has its sporophore extended well above the trophophore. C=10

AQUATIC FERNS:

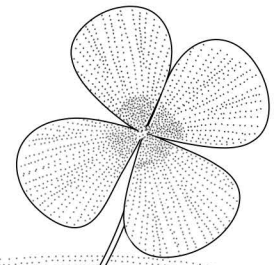


Mosquito Fern
(*Azolla caroliniana*)
is a rare, floating true fern with overlapping leaves that lives in still waters. C=5



Mexican Mosquito Fern
(*Azolla microphylla*)

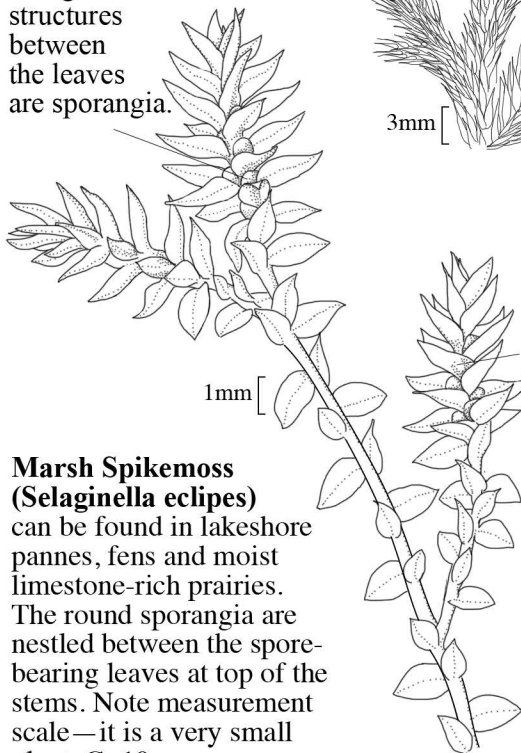
As Wilhelm and Rericha (2017) point out, determining local species in this genus is problematic.



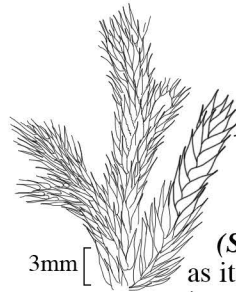
European Water Clover
(*Marsilea quadrifolia*)
looks like a four-leaf clover but is a fern. It is occasionally found where someone has emptied out an aquarium. It is unlikely to survive our winters.

SPIKEMOSSES:

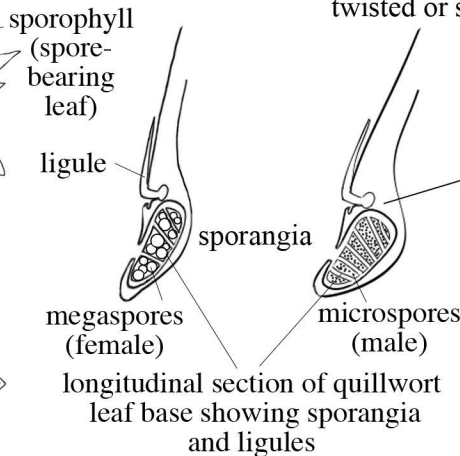
The globose structures between the leaves are sporangia.



Marsh Spikemoss
(*Selaginella eclipes*)
can be found in lakeshore pannes, fens and moist limestone-rich prairies. The round sporangia are nestled between the spore-bearing leaves at top of the stems. Note measurement scale—it is a very small plant. C=10

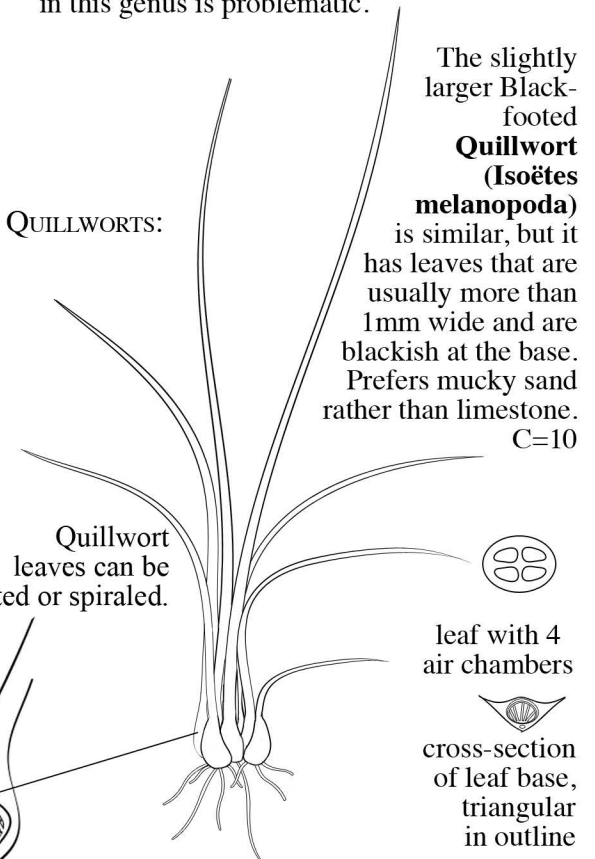


The strobilus is quadrangular in cross-section.
Sand Spikemoss
(*Selaginella rupestris*),
as its name implies, is found in our region in the dunes of Porter and Lake counties in Indiana. Both of the spikemosses on this page are very tiny! C=10



QUILLWORTS:

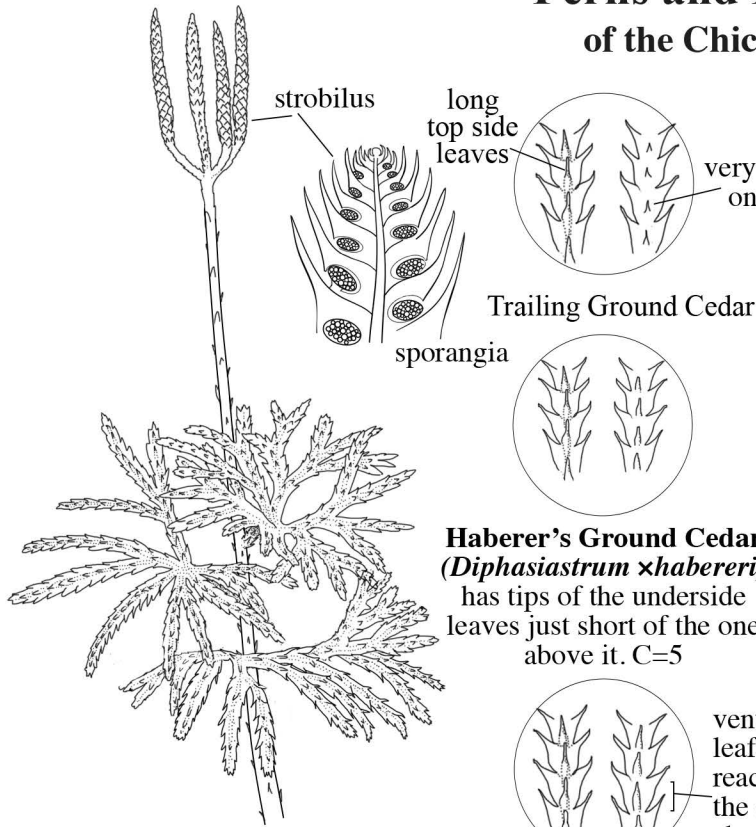
Quillwort leaves can be twisted or spiraled.



Glade Quillwort (*Isoetes butleri*) grows in wet depressions in shallow, gravelly outwash and loamy clay atop dolomite limestone. The sporangia are at the base of four-chambered hollow leaves. The shiny bright green leaves on this tiny plant are less than 1mm wide in our region. C=10

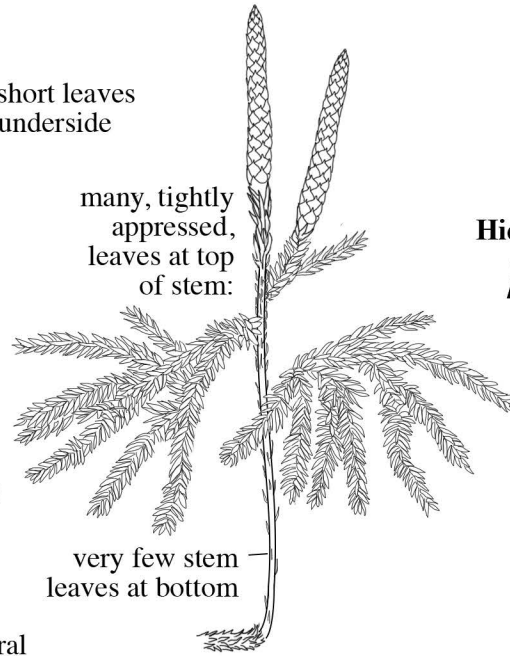
The slightly larger Black-footed Quillwort (*Isoetes melanopoda*) is similar, but it has leaves that are usually more than 1mm wide and are blackish at the base. Prefers mucky sand rather than limestone. C=10

Ferns and Lycophytes of the Chicago Region



Trailing Ground Cedar

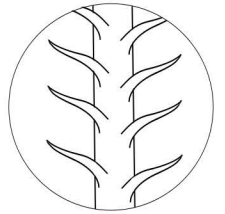
Haberer's Ground Cedar (*Diphasiastrum xhabereri*) has tips of the underside leaves just short of the one above it. C=5



Smooth Ground Pine (*Dendrolycopodium obscurum*) has tightly-appressed stem leaves and a single strobilus per fertile branch. C=10



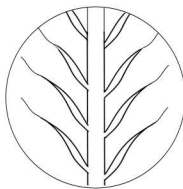
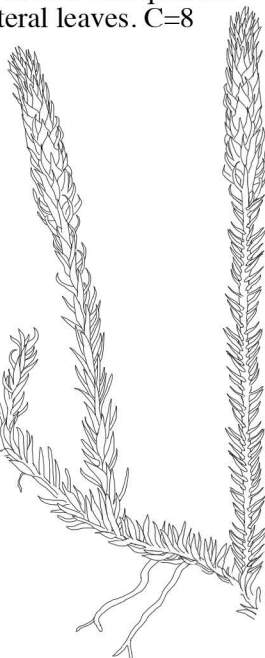
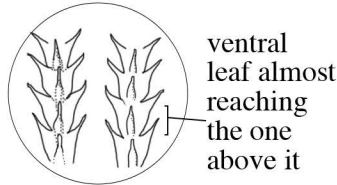
Hickey's Ground Pine (*Dendrolycopodium hickeyi*) has strongly ascending but not appressed stem leaves. C=10



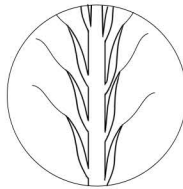
Leaves of **Prickly Ground Pine** (*Dendrolycopodium dendroideum*) are wide-spreading, very prickly to the touch. C=10

Trailing Ground Cedar (*Diphasiastrum digitatum*) has flattened branches that resemble fingers, hence its Latin name. Notice that the leaves on the ventral (under) side are much shorter than the lateral (side) ones. Larger branches >2mm wide. C=4

Running Ground Cedar (*Diphasiastrum tristachyum*) has ventral leaves that subequal the distal lateral leaves. C=8

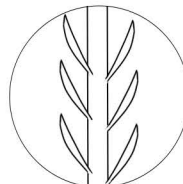


Running Ground Pine

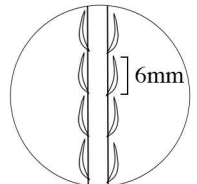


One-cone Ground Pine

One-cone Ground Pine (*Lycopodium lagopus*) has just one strobilus per fertile branch. Leaves of erect branches ascend. C=10



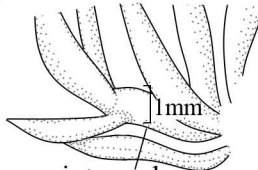
Marguerite's Clubmoss (*Lycopodiella margueritae*) has somewhat spreading leaves. C=10



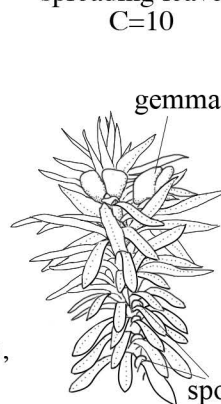
Greater Bog Clubmoss (*Lycopodiella subappressa*) has ascending, almost appressed leaves. C=10



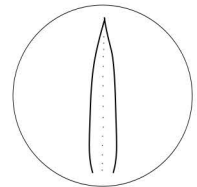
Running Ground Pine (*Lycopodium clavatum*) has two or more strobili per fertile branch. Leaves of erect branches spread and have long, hairlike tips. C=10



Lesser Bog Clubmoss (*Lycopodiella inundata*) like the other lycophytes, has single strobili, with internodes of horizontal stems less than 1mm in diameter. C=10



Shining Clubmoss (*Huperzia lucidula*) leaf is widest above the middle and has teeth. C=10



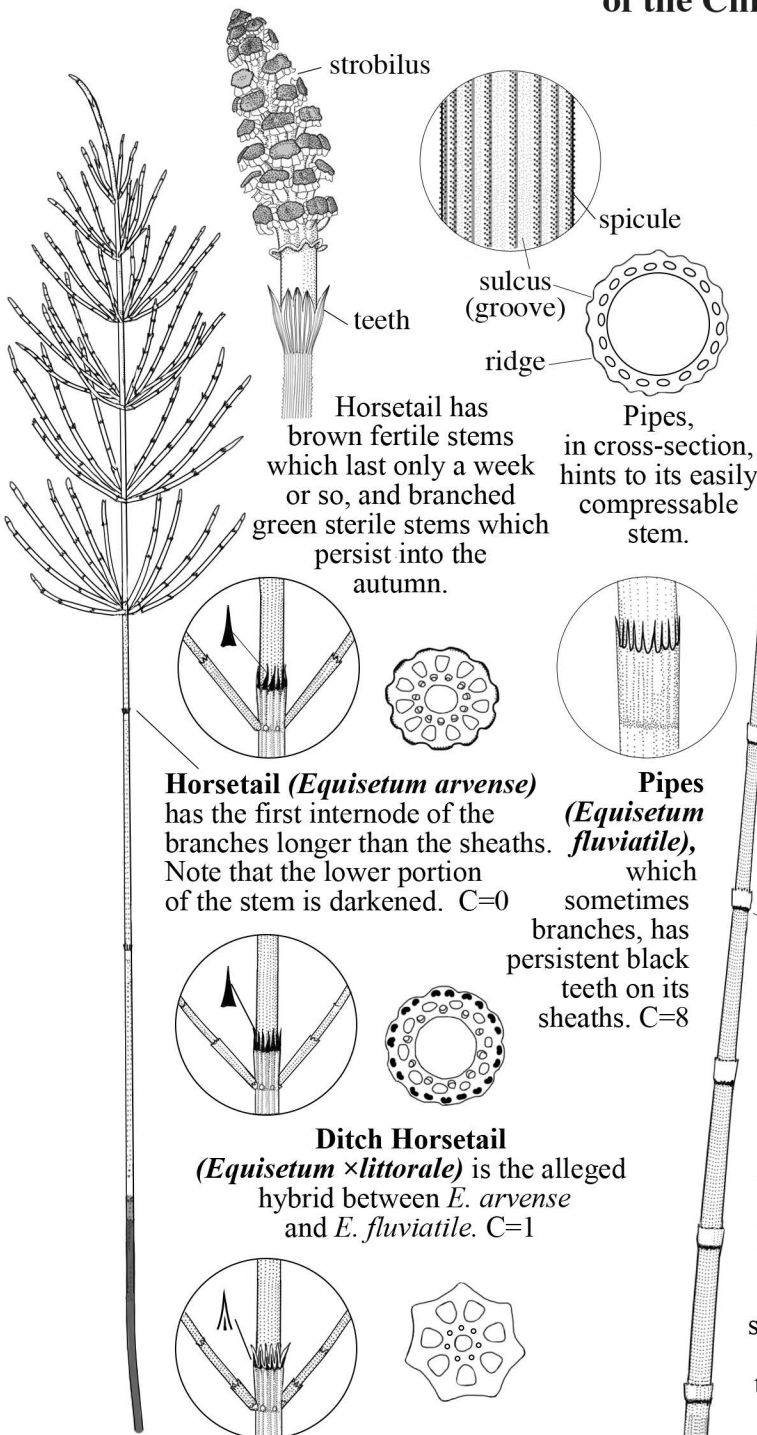
The leaf of **Cliff Clubmoss** (*Huperzia porophila*) has nearly parallel sides and few to no teeth. C=10

Huperzia is the only clubmoss with reflexed leaves. It is also distinct from other clubmosses by annual constrictions along the stem that give it a shaggy look. It can clone itself by shedding its gemmae.

Ferns and Lycophytes of the Chicago Region

BRANCHED:

BRANCHLESS:



Horsetail (*Equisetum arvense*) has the first internode of the branches longer than the sheaths. Note that the lower portion of the stem is darkened. C=0

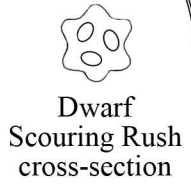
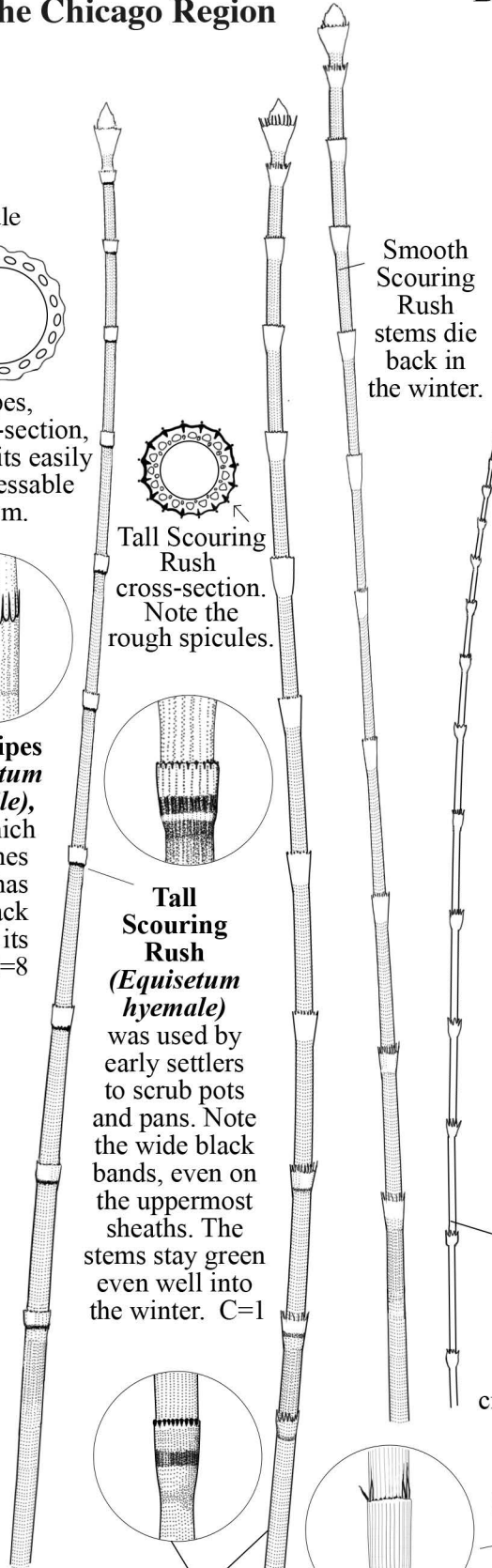
Pipes (*Equisetum fluviatile*), which sometimes branches, has persistent black teeth on its sheaths. C=8

Ditch Horsetail (*Equisetum × littorale*) is the alleged hybrid between *E. arvense* and *E. fluviatile*. C=1

Marsh Horsetail (*Equisetum palustre*) has the first internode of the branches shorter than the stem sheath, and white papery margins on the teeth. (*E. pratense* is similar but the midnerves of the teeth are black.) C=10

reddish-brown teeth

Wood Horsetail (*Equisetum sylvaticum*) is the only one in the world whose branches also branch. The stems eventually turn from brown to green, with the strobilus remaining brown, then withering. C=10



Dwarf Scouring Rush (*Equisetum scirpoides*) is the smallest of all our horsetails, and grows in tangled clumps. It has not been seen in more than 100 years in our region. C=10

Mackay's Horsetail (*Equisetum × mackaii*) is considered to be a natural hybrid between *E. hyemale* and *E. variegatum*. C=10

Nelson's Horsetail (*Equisetum × nelsonii*) is the hybrid between *E. laevigatum* and *E. variegatum*. Look for its few spicules, at most one row. C=10

Small Scouring Rush cross-section

Small Scouring Rush (*Equisetum variegatum*) is the second-smallest horsetail in our region. Look for the smooth stem and wide, white margins on the teeth. C=10

Glossary to Ferns and Lycophytes of the Chicago Region

- abaxial* ~ Said of a surface that faces away from the axis of the structure to which it is attached.
(Usually the top side of a leaf but not always.)
- adaxial* ~ Said of a surface that faces toward the axis of the structure to which it is attached.
(Usually the underside of a leaf.)
- appressed* ~ Lying flat against a surface.
- aquatic* ~ Living out the life cycle in water.
- ascending* ~ Growing or directed in an upward direction, or at least tending to do so.
- attenuate* ~ Gradually tapered to a slender tip.
- auricle* ~ Ear-shaped appendage or lobe.
- axis* ~ The central part of a longitudinal support, commonly of a stem or inflorescence, on which organs or parts are arranged.
- bipinnate* ~ Twice pinnately compound.
- blade* ~ the expanded portion of a foliar or floral organ.
- branch* ~ A secondary shoot that arises from a stem or the bifurcation of a root into smaller order units.
- bulblet* ~ A small bulb-like organ, particularly one that proliferates from a leaf axil or sterile flower.
- bristle* ~ Stiff hair.
- calcareous* ~ Limy, containing calcium.
- C-value* ~ Coefficient of Conservatism. Developed by Dr. Gerould S. Wilhelm in 1977, it assigns a 0-10 ranking of confidence that the species in question is indicative of the area's remnant (undisturbed by human development) status. A 10 signifies a 100% certainty, a zero means zero certainty, or conversely, 100% certainty that the area has long been disturbed or altered. We usually only see ferns in remnant plant communities.
- capitate* ~ Head-like; densely clustered.
- costa* ~ A riblike structure.
- cryptogam* ~ a plant or other organism that reproduces by spores rather than flowers or seeds
- dissected* ~ Cut or divided into narrow segments.
- fen* ~ A kind of alkaline wetland, usually with a water source that flows in and out. (Compare to bogs, which are primarily acidic in pH from decaying peat, without those constant influxes.)
- fertile frond* ~ That part of the fern that carries the spores and sporangia.
- fiddlehead* ~ The curled-up fronds of the emerging fern.
- frond* ~ The leaf-like blade of a fern.
- gemma* ~ a small group of cells that serves as a means of vegetative reproduction in some mosses and liverworts. These cells detach from the parent plant and form a new plant genetically identical to the original.
- gland* ~ A sessile or stalked structure that can secrete a fluid.
- haploid* ~ With half the full component of the chromosomal content.
- hybrid* ~ The offspring of parents of two species, generally from the same genus.
- indusium* ~ In ferns, the delicate flap or covering connected to the sorus.
- internode* ~ That portion of the stem other than the node; the distance between two nodes.
- lateral* ~ Pertaining to the sides, or positions of veins.
- ligule* ~ A narrow, strap-shaped part of a plant .
- locule* ~ A clear cavity or space within an organ.
- locular* ~ Pertaining to a locule.
- margin* ~ Generally, the edge of a planar organ.
- megaspore* ~ The larger type of haploid spore (when two sizes are present) that gives rise to the female gametophyte; see microspore.

- mesic* ~ Describing a microclimate or plant community in which there is a moderate amount of moisture.
- microspore* ~ Haploid spore that gives rise to the male gametophyte, generally smaller than the megaspore.
- midrib/midvein* ~ Midnerve; the central or principal vein of a foliar or bracteal organ.
- nerve* ~ vein
- netted* (as in veins) ~ giving the appearance of an open mesh or fabric.
- node* ~ The point along a stem that gives rise to leaves, branches, or inflorescences.
- panne* ~ A flat, often seasonally-inundated wetland behind a series of foredunes or dunes.
- perpendicular* ~ At an angle of 90° to a given line, plane, or surface.
- petiole* ~ The stalk of a leaf.
- pinna* (pl: pinnae) ~ One of the principal divisions in a pinnate or pinnately compound leaf or frond.
- pinnate* ~ In reference to a foliar structure that is compound or deeply divided, the principal divisions arranged along each side of a common axis.
- pinnatifid* ~ Incompletely pinnate, the clefts between the segments not reaching the axis.
- pinnule* ~ One of the principal divisions of a pinna.
- rachis* (pl: rachides) ~ The principal axis of an inflorescence or compound leaf .
- remnant* ~ Usually referring to a natural area that has not been substantially altered by development.
- rhizome* ~ An underground stem with nodes and short to elongate internodes.
- scale* ~ Generally a thin, sometimes scarious, much reduced leaf, bract, bractlet, or perianth segment.
- segment* ~ One of the units of a perianth or calyx, or of a leaf that is divided but not fully compound.
- sheath* ~ A tubular structure effected by the coming together of leaf margins around the stem.
- sorus* (plural: *sori*) ~ A cluster or discrete aggregation of sporangia.
- spicule* ~ A hard point or protuberance, typically on a leaf margin, but in *Equisetum*, along the stems.
- sporangium* (plural: *sporangia*) ~ *Spore*-producing structure.
- spore* ~ An asexual, typically 1-locular, haploid cell.
- sporophyll* ~ a leaf that bears sporangia; more generally used in reference to the reproductive structure of ferns in the Ophioglossaceae family (*Ophioglossum*, *Botrychium*, *Botrupus*, *Sceptridium*) where it appears that the fertile frond arises from a juncture of the sterile frond and the stipe.
- sterile* ~ Incapable of reproducing sexually; also in reference to soil that is poor in nutrients.
- stipe* (adj.: *stipitate*) ~ A small connecting stalk; sometimes a small stalk that elevates the pistil or flower above the receptacle or pedicel; the “petiole” of a fern frond.
- strobilus* (pl.: *strobili*) An inflorescence, often hard or woody and characterized by a series of imbricated scales; a cone.
- subequal* ~ Nearly, but not exactly, equal in size.
- sulcus* ~ Lengthwise groove.
- tooth* ~A sharp process at the edge of a tissue (pl. teeth).
- trophophyll* ~ a sterile frond; more generally used in reference to ferns in the Ophioglossaceae family (*Ophioglossum*, *Botrychium*, *Botrupus*, *Sceptridium*) where it appears that the sterile frond arises from a juncture of the fertile frond and the stipe.
- tripinnate* ~ Having leaflets that are subdivided three times, in a pinnate arrangement.
- triradiate* ~ Having three rays or radiating parts.
- ultimate segment* ~ The segment at the very end of a stem, leaf, or leaflet.
- vascular* ~ In reference to veins or conducting vessels.
- vein* ~ A thread of fibro-vascular tissue in a leaf or other organ.
- venation* ~ The arrangement or nature of the *veins*.
- ventral* ~ In reference to the inner or *adaxial* face of an organ; opposite of dorsal.