Dryopteridaceae
Wood Fern Family

A large family of perennial ferns from creeping stems. Sixty genera worldwide include 3000 species. The plants are terrestrial, occasionally growing on rock. Stems are creeping or erect, and sometimes branched. Scales may or may not be present. Blades are circinnate in bud and may be dimorphic in some genera. Petioles often have persistent scales. Leaves sometimes have simple blades or may be from 1–5 times pinnate. Blades may be covered with indument of scales, glands or pubescence especially on the rachises. Sori are borne on the lower surface of the blades, on the veins or terminating a vein. Indusia are sometimes present.

Key to genera

A. Fertile fronds vastly different from sterile fronds. B

B. Sterile blades deeply and irregularly divided; fertile blades twice-pinnate; sori enclosed in small round pinnules. *Onoclea*

bb. Sterile and fertile blades once-pinnate; sori on linear pinnae, enclosed by hardened pinnae margins. *Matteuccia*

aa. Fronds all same size, although fertile pinnae may be smaller than the sterile pinnae on the same frond. C

C. Indusia scale-like and segmented, completely surrounding sori. *Woodsia*

cc. Indusia attached centrally or marginally and not segmented, or absent. D

D. Sori elongated, straight or hooked at one end; indusia present. E

E. Costal grooves shallow; stems long-creeping.; blades once pinnate. *Deparia*

ee. Costal grooves deep; rhizomes short-creeping or erect; blades twice–pinnate. *Athyrium*

dd. Sori not as above; indusia present or absent. F

F. Indusia attached at distinct point, round or kidney-shaped. *Dryopteris*

ff. Indusia absent, or if present, laterally attached, hoodlike and arching. G

G. Indusia kidney-shaped, attached at the sinus. *Dryopteris*

gg. Indusia attached by a central stalk *Polystichum*

H. Indusia present, may be inconspicuous; rhizomes reclining, creeping; scales < 5mm long. *Cystopteris*

hh. Indusia absent.		I
	I. Rhizomes long, blades broadly triangular; petioles longer than the blades; scales absent.	*Gymnocarpium*
	ii. Rhizomes short or arching; scales > 5mm long.; blades ovate or lanceolate; stipes shorter than the blades and very scaly at the base; scales more than 5mm long.	*Athyrium,* in part

Athyrium Roth

A worldwide genus, only two species are native to North American. Fronds arise from erect or short-creeping rhizomes. They are deciduous, with the stipe half the blade length or less. Stipe bases are swollen and toothed, persisting over the winter as a food storage structure (tropophore).

Athyrium filix–femina (L.) Roth
Northern Lady Fern

Photo by Sean Blaney

Ours have the fronds twice pinnate, with nearly alternating dentulate pinnules. Pinnules adjacent the rachis are often smaller than distal ones. Sori are straight or curved, arranged in rows, and covered by toothed pubescent indusia. Stipes are brittle, bearing scales only at the base. These plants have been named ssp. *angustum* (Willd.) RT Clausen.

Frequents borders, of roads, forests, wetlands, thickets or pastures.

Common throughout.

NF to SK, south to NC and MO; CO. Greenland.

Cystopteris Bernh.
Bladder Ferns

A genus of 20 species, five are found in Nova Scotia. Monomorphic fronds are deciduous, arising on long stipes, up to three times the blade length. Trophopods are present. Blades are at least once pinnate; the pinnae reduce in size distally. Smooth plants although they may be sparsely pubescent in the axils. Sori arranged in single rows central on the toothed pinnules. Indusia form a hood above the sori. These may be persistent or deciduous at maturity. Readily forms hybrids, complicating identification.

Keys to species

A. Blades widely deltoid ovate; lowermost pinnae with unequal sides; rhizomes cordlike, long-creeping; frond bases > 10mm apart. — *Cystopteris montana*

aa. Blades elliptic-deltate; proximal pinnae equal; rhizomes not cordlike, short-creeping; bases of fronds < 5mm apart. — B

B. Rachis, costae, indusia and veins of distal pinnae sparsely to densely pubescent with glandular hairs; blades lanceolate; rachis and costa usually with bulblets. — C

C. Only later fronds fertile; stipes reddish when young, aging green or straw-coloured; spores 33–38µ. — *C. bulbifera*

cc. Distal pinnules only sparsely pubescent; nearly all with sori; stipes not reddish; spores 38–60µ. — *C. laurentiana*

bb. Glandular pubescence absent; blades ovate; bulbets absent. — D

D. Pinnae at acute angles to rachis; pinnae margins with round teeth. — *C. tenuis*

dd. Pinnae typically at 90degrees to rachis; margins serrated. — *C. fragilis*

Cystopteris bulbifera (L.) Bernh.
Bulbet Bladder Fern

Photo by David Mazerolle

A delicate species, the blades are twice-pinnate; pinnules are toothed. Tips of the fronds are long-attenuate. Frequently the frond bears small bulbs distally, at the base of a pinnule, up to the size of a small pea. Internodes are less than 5mm long.

Spores produced from June to September.

Photo by Sean Blaney

Fertile or calcareous soils, where it forms dense colonies in forested gypsum sinkholes.

Local, Kings and Cumberland counties to eastern Cape Breton.

NF to ON, south to GA and AZ.

Cystopteris fragilis (L.) Bernh.
Brittle Fern

Photo by David Mazerolle

Photo by Sean Blaney

Delicate and fragile this fern has smooth stipes, which are usually darker in colour at the base. Scales, if present, are scattered at the base. Blade is smooth, with lowermost pinnae widely separated from the upper ones. Pinnae are oriented 90 degrees to rachis.

Often frequents higher altitudes than others of the genus. Associated with waterfalls, ravines, deciduous forests and moist cliffs.

Scattered from Digby Neck and Cumberland County to northern Cape Breton. So far unknown in southwestern NS.

NF to AK, south to NC and CA; Eurasia.

***Cystopteris laurentiana* (Weatherby) Blasdell**
Laurentian Bladder Fern

Internodes are very short, usually less than 5mm long. Occasional glandular hairs are found especially on specimens with large spores. Our *C. fragilis* specimens should be examined for inclusion here.

Cliff ledges, cracks and crevices, especially calcareous rock.

So far known only from Victoria and Inverness counties.

Species ranges from NF to ON, south to IA, IL and PA.

***Cystopteris montana* (Lam.) Berhn. Ex Desvaux, Mountain Bladder Fern** was recently recorded from Victoria and Inverness counties. The presence of it is still considered to be dubious in Nova Scotia.

***Cystopteris tenuis* (Michx.) Desv.**
McKay's Brittle Fern

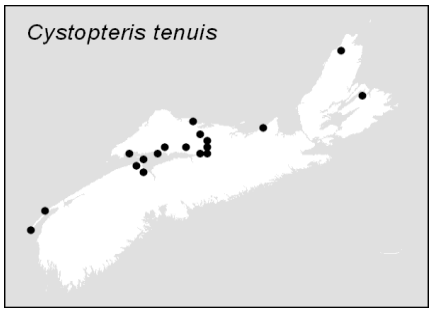
Smooth stipes arise from creeping rhizomes, with short internodes. Fronds clustered at the top of the stems. Stipe bases persistent. Scales are black or tan. Pinnae attached at acute angle to rachis. Indusia lack glands.

Limited to shady rock on cliff–faces or beneath forests.

From Brier Island, Digby Co. to Kings and Colchester counties. Cape Breton.

NS to ON, south to AL, AR and NV.

Photo by Roger Lloyd



Deparia Hooker & Greville

A genus of 50 species worldwide; our single species was once included in *Athyrium*. Fronds are narrowly elliptic to lanceolate. The sterile and fertile fronds are similar and deciduous. Stipe is less than half the length of the blade. Its swollen base may be dark red with two rows of teeth. Scales are light brown. Sori elongated, straight or hooked. Indusia have thickened margins.

Deparia acrostichoides (Swartz) M. Kato
Silvery Spleenwort

Photo by Sean Blaney

Very long fronds arise from the rhizome. Blades are lanceolate, each pinna long and tapering to a point. Sori placed at a 45-degree angle to the midrib and on either side of it. Upon maturity, they turn silvery.

July to September.

Deciduous forests, seepy slopes and streamsides in alluvial soils.

Photo by Roger Lloyd

From Annapolis County to northern Cape Breton, less frequent along the Atlantic.

Elsewhere from NS to ON, south to GA and LA; eastern Asia.

Dryopteris Adanson
Wood Ferns

Temperate ferns, they are best developed in Asia. They may be evergreen or deciduous. Often difficult to separate because of frequent hybridisation. Hybrids are excluded from the key below, being generally intermediate in form to their parents.

A. Plants aromatic; blades densely scaly, glandular; old fronds persisting; fronds to 25cm in length.	*Dryopteris fragrans*
aa. Plants not aromatic; blades smooth or sparsely scaly and not glandular or only slightly so; old fronds not persisting; fronds exceeding 25cm in length.	B
B. Blades 2–3-times pinnate at base.	C
C.Innermost lower pinnules shorter than adjacent pinnules on basal pinnae.	*D. intermedia*
cc. Innermost lower pinnules longer than those adjacent.	D
D. Lower basal pinnule on each basal pinna closer to the upper basal pinnule, rather than to second upper one.	*D. carthusiana*

	dd. Lower basal pinnule closer to the second upper pinnule rather than the upper proximal one.	*D. campyloptera*
bb. Blades pinnate to twice–pinnate at the base.		E
	E. Sori marginal or nearly so; stipes with dense tuft of tawny scales at the base.	*D. marginalis*
	ee. Sori midway between margins and midribs of pinnules; stipes with tan or dark brown scales at the base.	F
	F. Stipes <1/4 length of fronds; scales mixed in size and shape.	*D. filix–mas*
	ff. Stipes to 1/3 length of frond; scales broad to narrow but not hairlike.	*D. cristata*

***Dryopteris campyloptera* (Kunze) Clarkson**

Eastern Spreading Wood Fern; dryoptère arquée

Photo by Sean Blaney

Larger and more triangular than others of the genus. Deciduous, the frond forms an arching crown above the stout scaly rhizome. Stipe is shorter than the blade and not glandular. Pinnae borne on short stalks. Spreading habit.

Most abundant under maple, especially where moist and cool.

Along the Fundy shores and in Cape Breton. Few Yarmouth County collections, but generally not Atlantic.

NF to QC, variously south to NC.

Hybrids form with *D. expansa* and with *D. intermedia*.

***Dryopteris carthusiana* (Vill.) Fuchs**
Spinulose Wood Fern; dryoptère spinuleuse

Photo by Ross Hall

Lanceolate blades borne atop brown, scaly stipes. Pinnae are attached at an angle. Pinnules have spine-tipped teeth. Inner lower pinnules of the basal pinnae are longer than the adjacent ones.

Produces spores from June to August. Damp woods.

Scattered from Lunenburg and Queens counties to northern and eastern cape Breton.

NS to YT, south to OR, AR and GA.

Will form hybrids with five other species. In particular, *D.* X *triploidea* Wherry (*D. intermedia* X *carthusiana*) has been collected from Shelburne to Inverness counties. Ranges from NS to ON and New England south to NC, KY and MN.

***Dryopteris cristata* (L.) Gray**
Crested Shield Fern; dryoptère à crêtes

Narrow fertile fronds and glossy sterile fronds will separate this species. Basal pinnae are reduced in size and deltate. Fertile fond pinnae turned 90 degrees to rachis. Firm and erect, this species does not form solid colonies, rather occurs in small numbers.

In wet alder thickets, swamps and bogs. Can persist in sunny locales.

Scattered throughout but not abundant.

NF to BC, south to ID, MO and AL. Europe and western Asia.

Dryopteris X *boottii* (Tuckerm.) Underw. is a hybrid with this

Photo by Sean Blaney

and *D. intermedia*. A frequent hybrid in Canada. In NS we have widely scattered localities. Ranges from NF to ON and WI, south to VA, WVA and TN.

Dryopteris filix-mas (L.) Schott.
Male Fern; dryoptère fougère-mâle

Photo by Sean Blaney

With narrowly lanceolate fronds reaching 1m in length, this fern is unmistakable. Pinnae are toothed; the stipe short and heavily scaled. Resembles *D. marginalis*, but is not as leathery in texture.

Spores produced from late June to early September.

Deciduous forests and ravines. Characteristic of the deciduous forest of north–central Cape Breton.

Frequent around Aspy Bay and Bay St. Lawrence, Victoria Co.

Greenland; NF to ON south to IL and PA; in the west BC to SK, south to CA and TX. Ireland and Eurasia.

Dryopteris fragrans (L.) Schott
Fragrant Wood Fern;

Photo by Sean Blaney

Small distinctive fern with glandular fronds. Plants have a pleasing aroma. Dried persistent fronds distinguish it from *Woodsia*.

Spores produced from June to September.

Look for it in dryish cliff overhangs and in crevices along streams or waterfalls.

Photo by Sean Blaney

Not common. Scattered along the Cobequids between Earltown and Parrsboro and streamside in northern Cape Breton.

An arctic species, NF to AK south to MN and mountainous NY; western Asia.

STATUS: YELLOW-listed.

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***Dryopteris intermedia* (Muhl.) Gray**

Evergreen Wood Fern; dryoptère intermédiaire

Photo by Sean Blaney

Fronds are lacy in appearance with bluish-green leaves persisting into the winter. Basal proximal pinnules are shorter than the adjacent ones. Stipe is scaly near the base. Indusium and base of the pinnae slightly glandular pubescent.

Frequents a variety of woodland habitats. Our most common wood fern.

Throughout the province.

Forms hybrids with eight other species, distinguished by their glandular indusia, costae and costules.

Ranges from NF to ON, south to GA and AL.

***Dryopteris marginalis* (L.) Gray**

Marginal Wood Fern; dryoptère à sores marginaux

Photo by Sean Blaney

Fronds are dark green above and grey–green below, standing up to 60cm. Often evergreen, fronds borne on very chaffy stipes. Scales are long and narrow. Pinnules are deeply toothed and acute. Named for its conspicuously marginal sori.

Grows in drier habitat than other wood ferns, in shady undisturbed ravines. Typical in deciduous or rocky forests; calcareous regions.

Common in its habitat throughout.

NS to ON, south to AL and MS; BC; Greenland.

Gymnocarpium

Oak Fern

North–temperate in distribution, we have a single species of the eight oak ferns. Creeping rhizomes bear deciduous fronds on slender stipes. Rarely pubescent, but they may bear tiny glands. Sori are round and without indusia.

***Gymnocarpium dryopteris* (L.) Newm.**

Common Oak Fern

Photo by Martin Thomas

Colonial, the fronds reach less than 40cm tall. Blades are thin and deltate in outline, usually with three glabrous branches.

Associated with dry, rocky deciduous forests.

Scattered throughout the province.

Greenland; NF to AK, south to OR, AZ and MD; Eurasia.

Matteuccia Todaro
Ostrich Fern

A single species of this genus reaches Nova Scotia. All are tall, coarse ferns with the mature fertile frond much shorter and very different in appearance. The vernacular name refers to the resemblance of the fertile frond to an ostrich feather when mature. The unfurled sterile blade resembles a fiddlehead (a character shared by all ferns), hence the other common name.

Matteuccia struthiopteris (L.) Todaro
Ostrich Fern; Fiddlehead Fern

Photo by Sean Blaney

One of our larger ferns, reaching a metre or more in height, The pinnae at the base of the blade are drastically reduced in size. Veins are straight not forked. Sterile blades are much longer than the stipes. Fertile fronds are much shorter, with the sori in rows along the edge, their margins hardened and rolled over them.

Rich floodplains, along rivers and small streams, in seeps above cliffs; strongly colonial.

Mostly northern and western, although there are collections from Kejimkujik National Park, and several Kings County localities.

NF to AK, south to VA, MO and BC.

Photo by David Mazerolle

Onoclea L.

Sensitive Fern

A monotypic genus, it is limited to the northern hemisphere. Plants bear two distinctly different fronds. Fertile fronds are long-persistent over several seasons; sterile frond, is irregular in outline and strongly deciduous, turning brown at the least frost. They are borne together on creeping rhizomes.

Onoclea sensibilis L.
Sensitive Fern

Photo by Sean Blaney

Sterile fronds have long pinnae with wavy margins, indistinct from the rachis, oppositely arranged. Fertile fronds have greenish pinnules that turn dark at maturity. Sori are borne in rows within the tightly rolled margins of the pinnules. Fertile frond resembles that of Ostrich Fern, but for the beadlike appearance of the pinnae, whereas the Ostrich fern has featherlike appearance.

Grows in wet soils as along streams, in swampy woods, ditches and elsewhere with a high watertable. Strongly colonial.

Common throughout NS.

Ranging from NF to MB, south to TX and FL.

Polystichum Roth
Christmas Ferns

These worldwide evergreen ferns total about 180 species. Sterile and fertile pinnae are borne on the same blade. Stipes equal blades in length or shorter. Pinnae are serrated; scales are present. Sori have persistent peltate indusia. Three species are found in Nova Scotia.

Key to species

1-4 Dryopteridaceae

A. Fertile pinnae contracted; sori indistinct, completely covering lower surface.	*Polystichum acrostichoides*
aa. Fertile pinnae not contracted; sori distinct.	B
B. Fronds only once-pinnate.	*P. lonchitis*
bb. Fronds twice-pinnate.	*P. braunii*

Polystichum acrostichoides (Michx.) Schott
Christmas Fern; Holly Fern; polystic faux-acrostic

Photo by Sean Blaney

Ferns form a crown of dark green fronds, close to the ground. There is a sharp lobe at the base of the pinnae and the margins are serrated. Sori are borne on the lower surface of the reduced distal pinnae.

Found in moist woods, especially of beech and maple; thickets and slopes, throughout the province.

Ranges from NS to ON, south to FL and TX.

P.X*potteri* Barr is a named hybrid between this and the next species. Collections extant from Colchester County and Cape Breton. Leaves are narrower than those of *P. brauni* and the sporangia are misshapen.

Polystichum braunii (Spenner) Fee
Braun's Holly Fern; polystic de Braun

Photo by Sean Blaney

Fronds are scaly, to 1m in length. Pinnules appear to be in pairs, with awned teeth. Sori arranged in two ranks along the midrib. North American plants have been separated from the typical variety of Europe, as var. *purshii* Fern.

Favours deciduous forests, ravines and seepy slopes.

Common in northern Cape Breton, and at Folly Lake,

Colchester Co. Found along the north mountain from Annapolis County to Cape Blomidon, Kings Co., in the Cobequids, eastward to western and central Cape Breton.

NF to ON, south to MN and PA; in the west AK, BC and ID. Eurasia.

***Polystichum lonchitis* (L.) Roth**
Holly Fern; polystic faux-lonchitis

Photo by Rodger Lloyd

This fern has very long and narrow fronds arising from short, scaly stipes. Pinnae are slightly curved upwards, their margins serrated. This is a small species with lustrous dark green fronds, of restricted distribution in NS.

Alkaline soils, on gypsum or limestone, rocky and shady spots.

Northern Cape Breton: Cape North, Bay St. Lawrence to Whycocomagh and River Denys.

Elsewhere from NF to ON south to NY; AK and NT south to AZ; Greenland. Eurasia.

STATUS: YELLOW-listed.

Woodsia R. Brown

Small ferns of the north-temperate or tropical high altitudes, there are 30 species. These plants are usually associated with rock. Compact and creeping, all fronds are similar and may be deciduous or evergreen.. Rows of sori on distal pinnules only.

Key to species

A.Blades and rachis smooth or nearly so; proximal pinnae fan–shaped, wider than long; mature stipes green or stamineous. *Woodsia glabella*

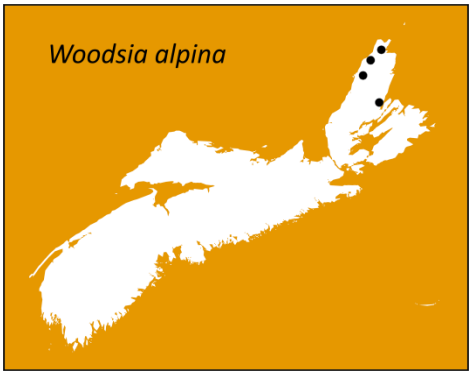
aa. Blades or rachis lightly pubescent or scaly; proximal pinnae longer than wide, triangular; mature stipes reddish brown or dark purple. B

B. Lanceolate scales absent on lower pinnae surfaces; largest pinnae with 1–3 pairs of pinnules. *W. alpina*

bb. Lanceolate scales very common on lower surfaces; largest pinnae with 4–9 pairs of pinnules. *W. ilvensis*

Woodsia alpina (Bolton) SF Gray
Alpine Woodsia; woodsie alpine

Photo by Sean Blaney



A cespitose species it has smooth blades. Bases of the stipes are sparsely scaly. The middle pinnae have 2–3 lobes.

Dry cliffs. An arctic species.

It is confined to northern Cape Breton: North Aspy River, Cheticamp River, Big Southwest Brook, Inverness County and Indian Brook, Victoria County.

Arctic regions. NF to AK, south to BC and NY; Ireland and Eurasia.

***Woodsia glabella* R. Br.**

Smooth Woodsia; woodsie glabre

Photo by Sean Blaney

Photo by Roger Lloyd

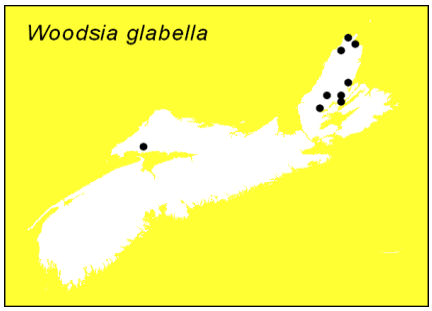
Fronds are smooth, with but a few sessile glands. The stipe is green or yellowish, but not brown. The small pinnae are sessile, nearly round and shallowly lobed.

A very rare fern, only found on vertical cliffs or streamside.

Mainland Nova Scotia has a single locality at Jeffers Brook, Cumberland County. The remainder of known sites are in northern NS: Big Southwest Brook, Lockhart Brook, and on Sky Glen Mountain.

Arctic, NF to AK, south to BC, MN and NY; Iceland and Eurasia.

STATUS: YELLOW-listed.



***Woodsia ilvensis* (L.) R. Br.**
Rusty Woodsia; woodsie d'Elbe


Photo by Sean Blaney

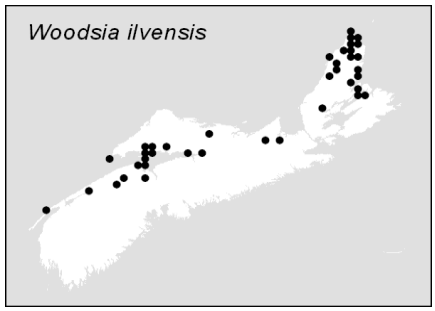

Photo by Roger Lloyd

Larger than our other *Woodsias*, it is easily separated on the jointed stipes. Blades are scaly. Sori nearly covering undersurfaces of blades.

Less restricted in habitat on cliffs and ledges, talus slopes.

From Digby Neck to Truro and Halifax. Northward through the Cobequids to Cape Breton.

Elsewhere from NF to AK, south to NC and BC; Eurasia.


Woodsia ilvensis