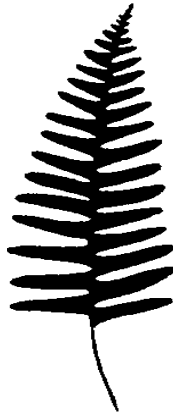
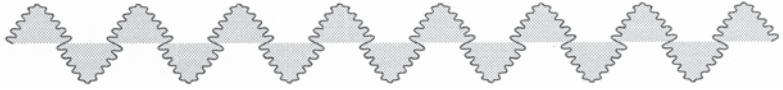


Common Ferns of Vermont



VERMONT

AGENCY OF NATURAL RESOURCES
Department of Forests, Parks and Recreation

Index

A Brief Natural History of Ferns	1
The Life Cycle of a Fern	2
Fronnd shape Identification	2
How to Use This Guide	3
Leafcut Identification	3
Key to Common Ferns of Vermont	4
Index of Scientific and Common Names	17
Recommended References	18

Foreword

This guide is intended as a brief introduction to the world of ferns. The most common ferns found in Vermont are represented here in a simple key with descriptions and drawings that will allow casual users to easily identify them. Since more than 50 species of fern have been described for Vermont in a variety of habitats, it is impossible to include all of them in this short text.

We hope that this guide will bring attention to a form of plant that is not well-known to most visitors, yet adds so much beauty and variety to New England landscapes.

If you cannot match a fern to the descriptions you find here, or you wish to study ferns in more detail, please consult the references at the end of this booklet.

A Brief Natural History of Ferns

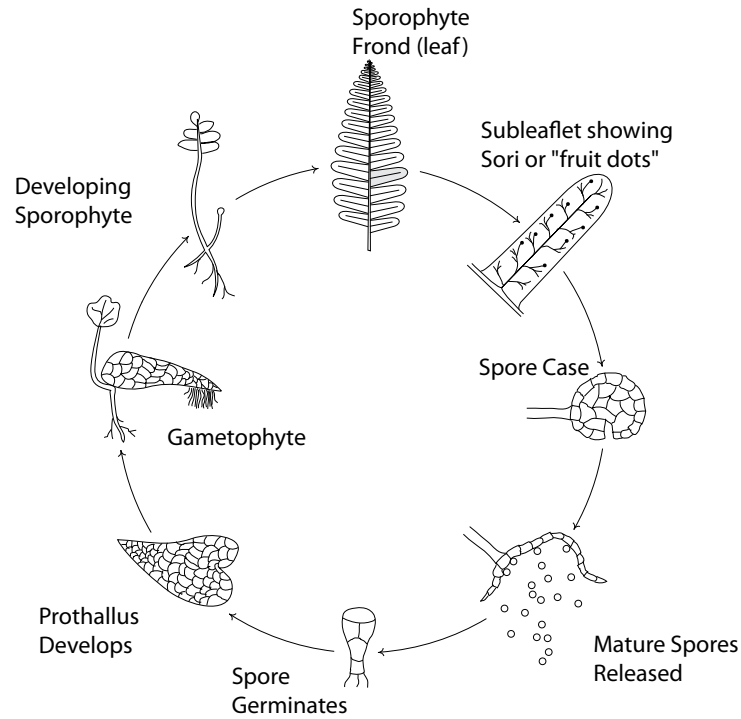
Ferns are non-flowering plants that reproduce by spores-dust-like particles found on various locations on the plant. They are allied with other non-flowering plants such as clubmosses, true mosses and horsetails which first appear in the fossil record of Earth 200-300 million years ago.

Ferns and their allies lack true leaves, stems, and roots. Nearly ferns are perennial (a single plant needs several years and two distinct stages to complete its life cycle). Some ferns are evergreen, and can be found all year, while others are visible only in summer.

The diagram on this page shows how ferns reproduce. Ferns look very different in the two stages of their lives. The most obvious form is that of the *sporophyte*, and this the stage you are most likely to see. The gametophyte stage occurs once the dust-like fern spores have dispersed and begin to germinate. After germination a fern is a tiny body called a *prothallus* and bears little resemblance to the sporophyte until it has had a chance to grow and develop. Many ferns can also reproduce *vegetatively*, that is by sending out stems or root-like rhizomes that develop into new plant clusters. A few like walking ferns or bulblet ferns form new plants from their fronds or from specialized nodules on the fronds.

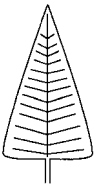
Since the spore-producing fruiting bodies of ferns can aid in their identification, it is important to look for these when you key out a fern. Most fruiting bodies appear as *sori* (also called fruit dots) on the underside of the fronds, but some appear on specialized stalks apart from the fronds.

Life Cycle of a Fern

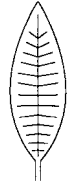


FronD Shapes

Broadset at base

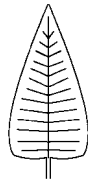


Semi-tapering to base



4

Tapering to base



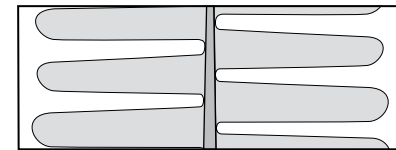
How to Use this Guide

The 20 common ferns in this booklet are identified using the mature sporophyte frond. There are four categories of structure of leaf into which the fronds are classified: once-cut, twice-cut, thrice-cut, and unique (non-fern). The accompanying diagram illustrates these. The only fern included in the “unique” category is that of maidenhair fern.

Once you have determined to which of the four categories a fern belongs, you are ready to use the key. Match your observation of the fern you seek to identify with the description provided in the key under the appropriate category. The key lists both the common name of the fern and the page in the text where a brief description of the plant and its habitat are listed.

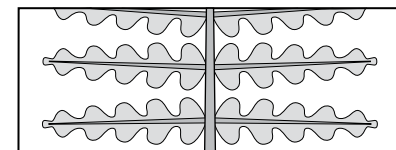
Leaflet Shapes

Once-Cut Fern



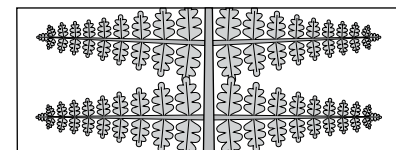
Simple Leaflet

Twice-Cut Fern

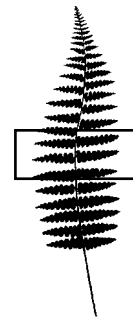


Leaflet with Subleaflets (pinnules)

Thrice-Cut Fern



Subleaflets (pinnules) with lobes



5

Key to Common Ferns of Vermont

A. Fronds of Unusual Shape

fronds are circular or semi-circular with black,
forked stalks..... **Maidenhair Fern** (p.7)

B. Fronds are Once-cut

1. fronds broadest at the base, leathery, with
wavy edges, fern is light green and may
be near brown stalks of what look like
small beads..... **Sensitive Fern** (p.7)

1. fronds semi-tapering to base.....2

2. stem stout and stiff, chaffy, leaflets pointed with
rough edges..... **Christmas Fern** (p.8)

C. Fronds Twice-Cut

1. fronds broadest at the base, lowest pair of leaflets
droop, frond bent..... **Long Beech Fern** (p.9)

1. fronds semi-tapered or tapered to their base; lowest
leaflets not droopy..... 2

2. fronds semi-taper to base.... 3

2. fronds taper to base..... 8

3. stem of frond wire-like, black at base; frond
delicate and nearly broadest at the
base..... **Marsh Fern** (p.9)

3. stem of frond firmer, not black at base; frond
of heavy texture..... 4

4. stem stout, hairy, or rough
with scales..... 5

4. stem stout, smooth, without
hairs or scales..... 6

5. stem with prominent rusty scales; spore cases
(if present) large and at edges of subleaflet
undersides.....**Marginal Woodfern** (p.10)

5. stem with silver hairs; spore cases like “spindles”
on underside of frond; frond nearly tapering
to base.....**Silvery Spleenwort** (p.10)

6. frond coarse, with cotton-like tufts at base of
leaflets..... **Cinnamon Fern** (p.11)

6. frond coarse without cotton-like tufts at leaflet
base..... 7

7. frond nearly tapered to base with subleaflets joined
at base; shriveled, spore-bearing leaflets
(if present) in center of frond
..... **Interrupted Fern** (p.11)

7. frond nearly broadest at base with subleaflets 1/4"
or more apart at base; spores (if present) at
tip of frond..... **Royal Fern** (p.12)

8. spores on shorter, separate brown stalk emerging
from the middle of clump; stem of green
fronds large, very coarse and deeply
grooved..... **Ostrich Fern** (p.12)

8. spores on underside of frond in small kidney-shaped
cases; stem delicate..... **New York Fern** (p.13)

D. Fronds Thrice-cut

1. frond solitary, stem soft
and fleshy..... **Rattlesnake Fern** (p.13)

1. frond in loose group or clump, stem not
soft or fleshy..... 2

2. fronds broadest at base,
triangular..... 3

2. fronds semi-tapered to
base..... 5

Species Descriptions

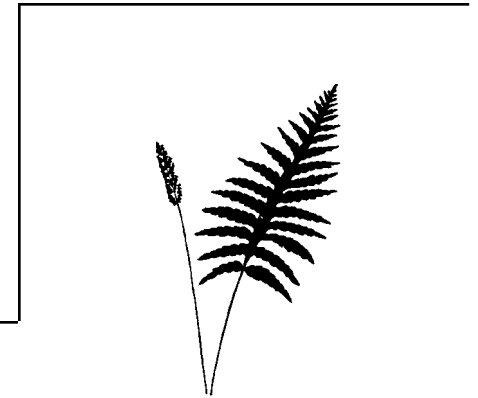
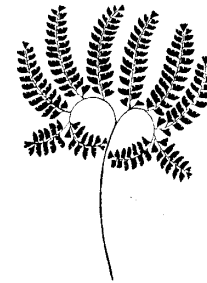
3. mature frond small; stem wire-like and brittle..... **Oak Fern** (p.14)
3. mature frond large, over 12"..... 4
4. stems long, grooved, rigid and mostly green..... **Bracken Fern** (p.14)
4. stems short, not grooved, flexible, reddish near base; sometimes small “balls” on undersides of leaflets..... **Bulblet Fern** (p.15)
5. fronds in a tight cluster, emerging from a central core, vase-shaped, stems hairy or scaly..... 6
5. fronds not in a tight cluster, stems finely hairy, brittle, not grooved, dark at the base, fragrant when crushed..... **Hayscented Fern** (p.15)
6. frond with coarse texture; stem with reddish scales, grooved, lowest leaflets large and broadest at their base.....**Intermediate Woodfern** (p.16)
6. frond with less coarse texture; stem green, or sometimes wine-red; grooved, not brittle, spore cases crescent-shaped on underside of leaflets..... **Lady Fern** (p.16)

Maidenhair Fern

Habitat: Rich moist, shaded soils, usually under mature hardwood trees, and especially where limestone is present.

Frond: Delicate, almost circular light green flat fronds on dark stems. Leaf is up to 16 “ tall with 5 or more leaflets on each stalk.

Fruiting Structure: Light-colored, only on upper edges of leaflet.



Sensitive Fern (Bead Fern)

Habitat: Damp to moist soils in either sun or shade. Very common.

Frond: Light green, variable size up to about 18", new leaves have reddish tint. Leaflets are nearly opposite with wavy margins. Leaves very sensitive to frost (hence name).

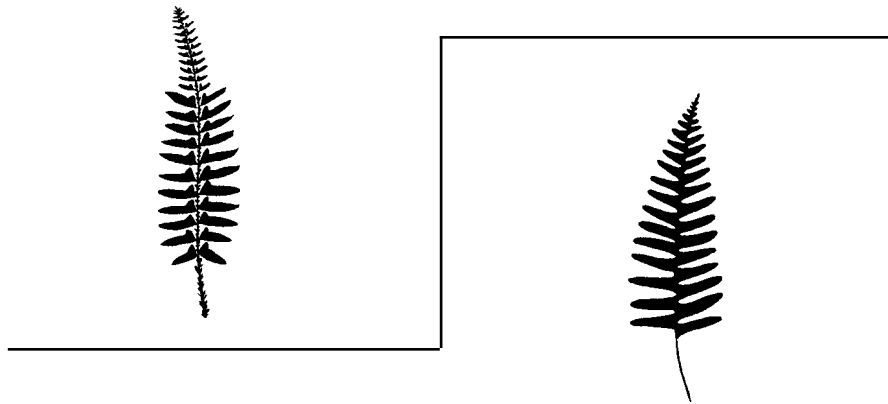
Fruiting structure: a specialized frond up to 12" tall that holds what appear to be bead-like capsules (hence the alternate name). Upon maturity, these fronds brown.

Christmas Fern

Habitat: Rocky or sandy soils that are shaded or semi-open.

Fronnd: Dark green, leathery foliage in a tapering lace-shaped formation usually 15 to 24" in length. Fronds are evergreen. Each leaflet has a distinct lobe that looks like an ear at its base. The stem of the frond has prominent scales.

Fruiting Structure: Numerous round fruit dots in rows on underside of leaflets.



Common Polypody (Rock Fern)

Habitat: Abundant on moist shady cliffs, rocks, logs, and shallow soils.

Fronnd: Smooth, leathery and bright green, they may reach 12" in length. A frond may have as many as 20 smooth, blunt leaflets.

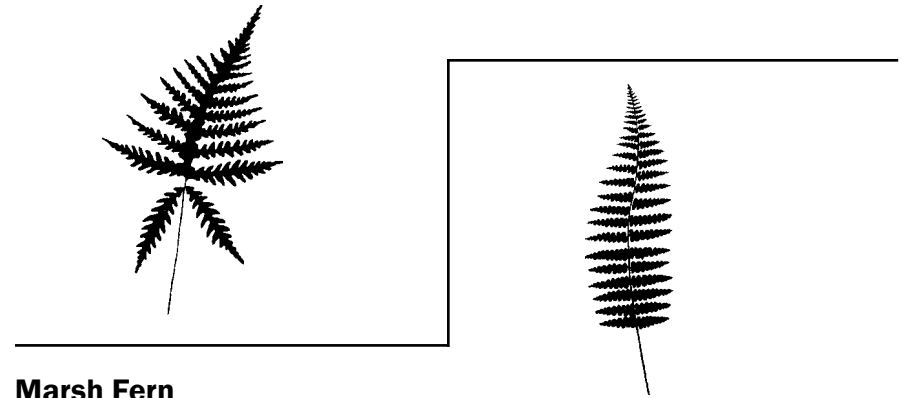
Fruiting Structure: Large round fruitdots on on the undersides of leaflets.

Long Beech Fern (Northern Beech Fern)

Habitat: Cool moist woods, along streams or on moist cliffs.

Fronnds: Yellow-green and triangular, this fern is usually about 12" long and seems to arch backwards. The lowest leaflets droop down and out from the others. There are usually about 12 pair of nearly opposite, stemless leaflets on each frond.

Fruiting Structure: Small fruitdots near margins of leaflets.



Marsh Fern

Habitat: Sunny to partial shade in moist fields, and open woodlots.

Fronnd: Thin and delicate, this bright green fern rustles easily in a breeze. It is about 12" in length with lance-shaped leaflets. Leaflets with fruitdots seem to grow over the dots, giving these leaflets a pointed shape.

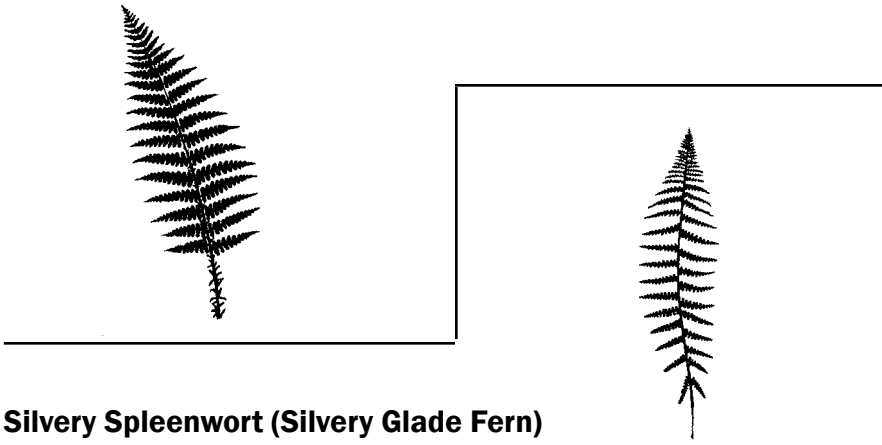
Fruiting Structure: Dots in rows along midvein of leaflet.

Marginal Woodfern

Habitat: Throughout semi-shaded woodlands.

Fronde: Up to 24" in length, this blue-green fern has chaffy scales on the stem. The foliage is evergreen and has both leaflets and sbleaflets. The sbleaflets are serrated or lobed, and may have 20 alternate pairs on each leaflet.

Fruiting Structure: Prominent in margins (hence the name) of sbleaflets.



Silvery Spleenwort (Silvery Glade Fern)

Habitat: Rich, moist shaded soils.

Fronde: Long (up to 36") yellow green with about 18 pair of leaflets. The stems of the fronds have silvery hairs, and the leaflets have fuzzy hairs on their undersides.

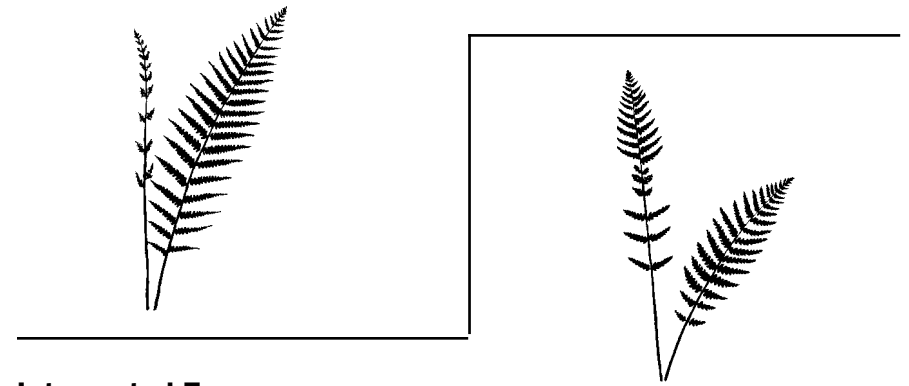
Fruiting Structures: Elongated fruitdots on the underside of leaflets.

Cinnamon Fern

Habitat: Common along river bottoms, and wet depressions.

Fronde: Large (often over 36 inches) bright green, with rusty tufts at the base of the sbleaflets. In spring, the stems emerge covered with rusty wool, then turn green although a few brown hairs may persist.

Fruiting structures: Separate fronds that emerge before sterile fronds, these are bright green at first, then turn to a cinnamon brown. Numerous spore cases on short stalks cluster on the stem.



Interrupted Fern

Habitat: Dry sites, often at the edge of roadsides or fields.

Fronde: Large (36 " or greater), and bright green, the fronds are woolly when emerging from the ground, then become smooth. Fronds form clusters in which several sterile fronds grow around three or more central fertile fronds. Fertile fronds have the "interrupted" appearance due to the spore cases in the center of the leaf. Leaflets taper to blunt tips.

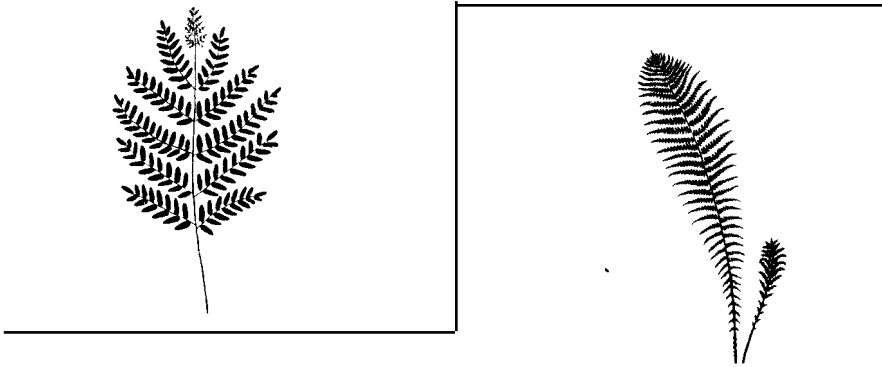
Fruiting Structures: The short-stalked spore cases form in the upper third of fertile fronds. These dark green clusters turn brown during summer.

Royal Fern

Habitat: Wetlands including wet meadows and water margins.

Frond: One of our largest, the light green Royal fern can reach heights of 6 feet. The frond resembles a compound tree leaf because of the widely spaced leaflets and subleaflets. Subleaflets with distinct stems.

Fruiting Structure: Found on the tips of some of the fronds, they are light brown clusters of short-stalked spore cases.



Ostrich Fern

Habitat: Common along river bottoms and open, wet woodlands.

FronDs: Among our tallest ferns, Ostrich ferns may reach six feet in height. Fronds grow erect and taper at both the base and tip, giving groups of fronds the appearance of a basket of bright green plumes. Each frond may have as many as 40 pairs of narrow, pointed leaflets.

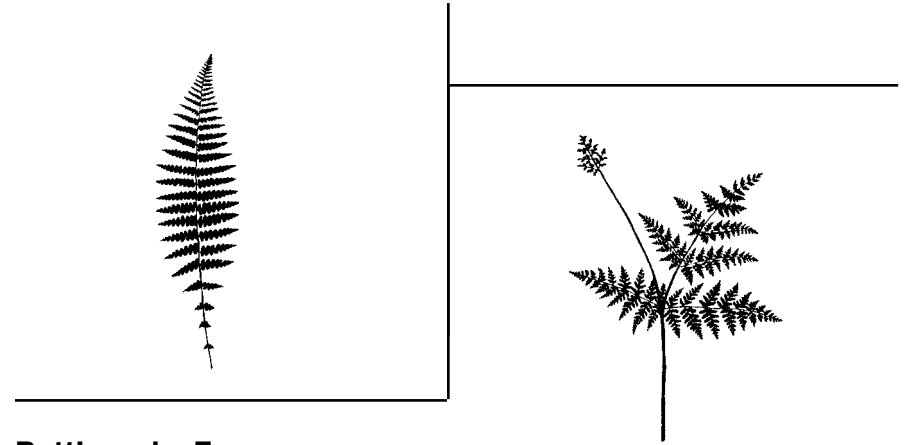
Fruiting Structure: A separate rigid grooved frond bears the spore cases that resemble pods. The plume-shaped frond is only about 12' in height. It turns dark brown and persists after the sterile green fronds have died.

New York Fern

Habitat: Mixed woodlands with open areas, not in wet sites.

Frond: Yellow-green and delicate, this fern is rarely over 18 " long. It seems to grow in tufts, and resembles a miniature Ostrich fern because the frond tapers at both ends like the Ostrich fern. The stalk may be scaly at the base and slightly hairy above.

Fruiting Structure: Small fruitdots near the margins of leaflets.



Rattlesnake Fern

Habitat: Rich soils in shady woods.

Frond: Triangular frond, often wider than it is long (about 12 " wide). Bright green and lacy in appearance with toothed leaflets.

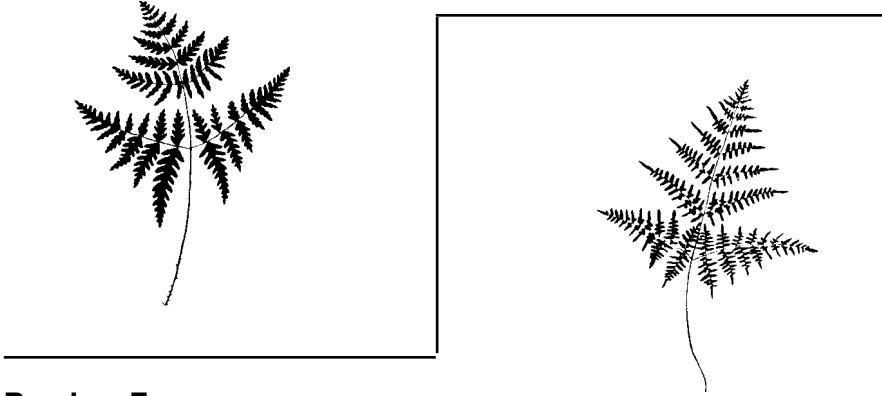
Fruiting Structure: A stalk forms at the base of the frond on the fern stem. This stalk grows above the frond and bears bright yellow spore cases in stalked clusters that resemble grapes.

Oak Fern

Habitat: Cool, moist and shady woodlands, often in rocky soils.

FronDs: Triangular shape, rarely more than 5" in either width or length, and yellow green in color. The frond has three distinct parts with lance-shaped, opposite leaflets.

Fruiting Structure: Tiny fruitdots on leaf undersides close the margins.



Bracken Fern

Habitat: Sunny, dry, barren or poor soils.

FronDs: Triangular, large (often 36" by 36") stout-stemmed and dark green in color, the fronds arch backwards. Each frond has three distinct sections. Leaflets are oblong with blunt tips

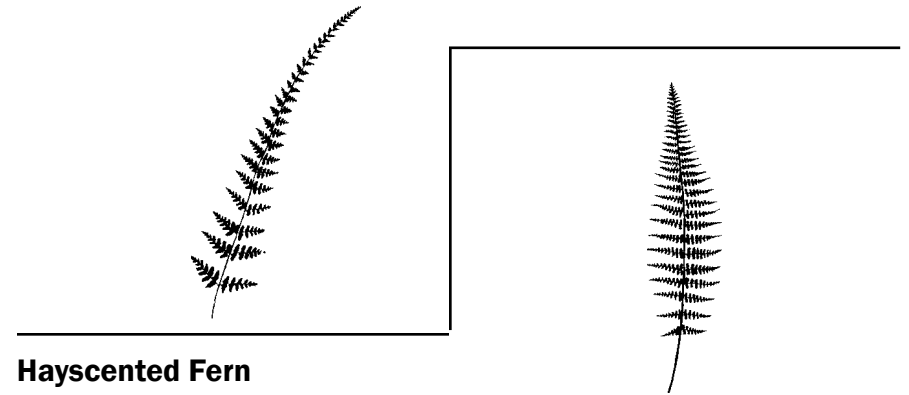
Fruiting Structure: Fruitdots in the leaflet margins partially covered by the curled edges of the leaflet.

Bulblet Fern

Habitat: Rocky areas or cliffs rich in limestone, often in large groups.

FronD: Elongated, pale green and lacy, the frond looks "droopy." Size varies depending on growing site, but usually about 8" long. Leaflets also have the droopy appearance, and are further divided into sub-leaflets.

Fruiting Structures: There are scattered fruitdots underneath the subleaflets, but leaflets also have small bulblet which allow it to reproduce vegetatively by dropping these bulblet onto the ground.



Hayscented Fern

Habitat: Sunny or partially shaded areas on a variety of soils. Very common.

FronD: Pale yellow green with droopy tips, the frond is up to 16' in length. The glandular fronds are easily broken and emit the characteristic grassy smell if crushed. Leaflets have hairy lower surfaces and numerous subleaflets.

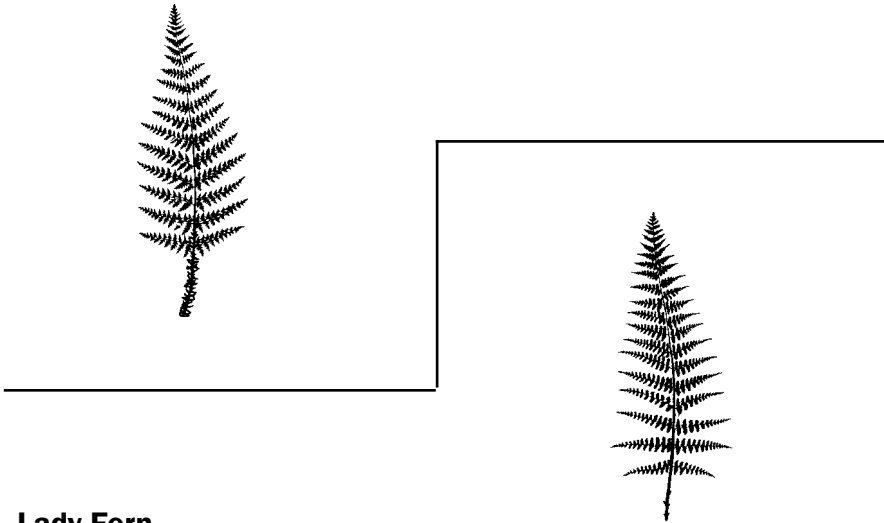
Fruiting Structure: Small fruit dots are found near the margins of the leaflets. The dots consist of tiny "cups" filled with spores.

Intermediate Woodfern

Habitat: Moist, rich woods

Froned: Evergreen and of a rich green color, leaflets and subleaflets have a variable, lacy appearance, and are about 12" long. The leaflets seem to point to the top of the frond. The stalk is dense with rusty scales.

Fruiting Structure: Small fruitdots are located near the tips of veins underneath the subleaflet.



Lady Fern

Habitat: Moist, semi-shaded sites.

Froned: Bright green, large (up to 30" tall) often with a grooved stalk and upward pointing leaflets. Often grows in circular clusters. Subleaflets are deeply cut.

Fruiting Structure: Short, dark fruitdots which are sharply curved.

Index of Scientific and Common Names

(from Cobb, 1963)

Bracken Fern (*Pteridium aquilinum*)
Bulblet Fern (*Cryopteris bulbifera*)
Christmas Fern (*Polystichum acrostichoides*)
Cinnamon Fern (*Osmunda cinnamomea*)
Common Polypody (*Polypodium vulgare*)
Hayscented Fern (*Dennstaedtia punctilobula*)
Interrupted Fern (*Osmunda claytoniana*)
Lady Fern (*Athyrium Filix-femina*)
Long Beech Fern (*Thelypteris phegopteris*)
Maidenhair Fern (*Adiantum pedatum*)
Marginal Woodfern (*Dryopteris marginalis*)
Marsh Fern (*Thelypteris palustris*)
New York Fern (*Thelypteris noveboracensis*)
Oak Fern (*Thelypteris hexagonopteris*)
Ostrich Fern (*Matteuccia Struthiopteris*)
Rattlesnake Fern (*Botrychium virginianum*)
Royal Fern (*Osmunda regalis*)
Sensitive Fern (*Onoclea sensibilis*)
Silvery Spleenwort (*Athyrium thelypteroides*)
Intermediate Woodfern (*Dryopteris intermedia*)

Recommended References

Cobb, Boughton. 1963. *A Field Guide to the Ferns*.
The Peterson Field Guide Series,
Houghton Mifflin Co. Boston, MA.

Sterling, Dorothy. 1955. *The Story of Mosses, Ferns, and Mushrooms*.
Doubleday and Co., New York.

Shuttleworth and Zimm. 1967. *Non-Flowering Plants*.
A Golden Nature Guide,
Golden Press, New York.



Vermont Department of Forests, Parks & Recreation
1 National Life Drive, Davis 2
Montpelier, VT 05620-3801

Text originally prepared by Doug and Sue Westin

This document available upon request
in large print, Braille and audio format.

VT TDD Relay (800) 253-0191

Printed on Recycled Paper

03/2014 ERP