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## An Identification Guide to the Ferns of the Florida Panhandle

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## Introduction

John Kunkel Small, in his 1931 “Ferns of Florida”, introduces the subject by stating that Florida should properly be termed “the land of ferns” rather than “the land of flowers”. This is more a demonstration of Small’s devotion to his subject than a statement of fact; seed plants outnumber ferns in Florida by a wide margin, both in numbers of kinds and in numbers of individuals. Nevertheless, there is a germ of truth in the thought. In specific areas, especially those cool, moist, shady places which most of us think of as the proper habitat for ferns, they may grow in luxuriance almost to the exclusion of other herbaceous plants. Small listed 90 species of ferns as occurring in the state, excluding the fern allies—plants botanically close to ferns, but appearing quite different, such as clubmosses and horsetails. Olga Lakela and Robert W. Long, in their 1976 book of the same title, record 116 species of true ferns from Florida. I have been able to list 46 different true ferns from the panhandle of Florida, alone. These are large numbers, substantially greater than other comparable regions of the country, and help justify Small’s enthusiasm.

Ferns are of considerable interest to a diverse group of people comprising botanists, landscape architects, gardeners, terrestrial ecologists, wild food lovers, wildlife biologists, and students of nature of all sorts. They are widely admired for their aesthetic qualities, appreciated for their nutritional content, and studied because of their impact on the lives of other plants and animals, and because of their intrinsic interest as representatives of a group of organisms once dominant among all land plants on the earth.

The true ferns are those plants belonging to the botanical division Pteridophyta. Their method of reproduction, and their life cycle in general, is quite different from that found among the seed plants, but this is a subject beyond the intended scope of this handbook. My purpose is strictly to provide a means whereby an individual with little or no botanical training may accurately and easily identify the kinds of ferns found in the Florida panhandle—the northwestern portion of the state made up of the following 16 counties: Bay, Calhoun, Escambia, Franklin, Gadsden, Gulf, Holmes, Jackson, Jefferson, Leon, Liberty, Okaloosa, Santa Rosa, Wakulla, Walton, and Washington.

A few words about “common” versus technical language are pertinent. Among all the specialties of biology, botany appears most richly endowed in specialized language; each morphological or anatomical variation has a specific applicable term. Thus, communications among botanists are reduced to a kind of shorthand in which

two or three of these terms substitute for whole sentences of more standard English. “The leaves of the ferns are finely divided, with each division being further subdivided” becomes “fronds twice compound”. At the cost of writing more words, but in the interest of clarity to a broader number of readers, I have avoided most of these terms. A few, however, are so widely useful that I have felt obligated to use them. These terms are defined below.

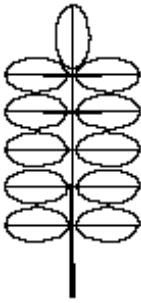
I should also mention common names. The vast majority of ferns do not have common names in the same sense that *Mimus polyglottus* is commonly called the Mockingbird. Once you have eliminated “Maidenhair Fern” (*Adiantum*) and “Boston Fern” (*Nephrolepis*), even a knowledgeable horticulturist is left with catchalls such as “Woods Fern” or “Swamp Fern”, conveying little specific information beyond general habitat. For this reason, and since many people are uncomfortable using the scientific designations, botanists and other authors have, over the years, invented their own “common” names, frequently direct translations of the scientific names. I have continued this tradition, listing the most applicable common names along with the preferable scientific names.

The bulk of this handbook consists of two identification keys. The first of these, the Complete Key, is tedious to use, but includes all fern species known from the panhandle. It is recommended for use by individuals with some training in the subject, or those already experienced in the identification of ferns. This key must be used if positive identification is necessary. The second identification key, the Rapid Key, is very easy to use, and is designed to allow for quick identification of the vast majority (certainly over 99%) of the fern plants likely to be encountered in the Florida panhandle. It is notably simple to use because the considerable number of panhandle ferns which are rare or of very localized occurrence are excluded—plants not likely to be encountered unless one is specifically searching for them. In addition, the various species of *Thelypteris* (the Shield Ferns)—often quite difficult to distinguish from one another—are not separated in the Rapid Key. This portion of the handbook is recommended for anyone attempting to gain initial familiarity with our fern flora, particularly anyone unaccustomed to botanical terminology or the use of identification keys.

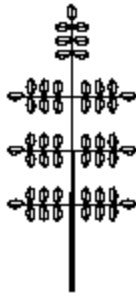
It should be kept in mind that some of the most important features which differentiate our various ferns are based on their reproductive structures. For this reason, one will usually only be able accurately to identify them if the ferns have matured sufficiently for sori to be present. (I have tried, however, to give hints for identification of immature plants in the Complete Key, when this is practicable.) Because many ferns do not mature until at least late spring or early summer,

attempts at identification during early spring, when the ferns are first becoming conspicuous, may be particularly frustrating.

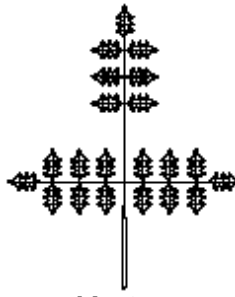
## Glossary



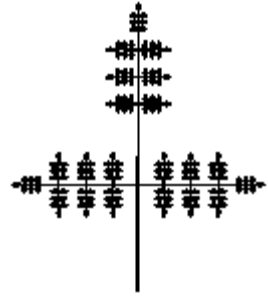
Singly Compound



Doubly Compound

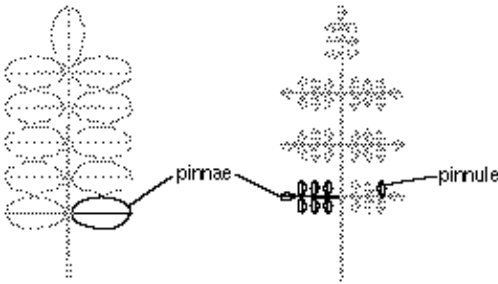


Doubly Compound  
(with strong lobing)



**Compound frond**—A frond which consists of several membranous surfaces clearly separated from one another. If the separate portions of the frond (the “pinnae”) are not themselves compound, the frond is **singly compound**. If the pinnae are compound, but with the divisions (the “pinnules”) not further divided into separate parts, the frond is **doubly compound**. In a **triply compound** frond, even the pinnules are divided into separate portions. It should be clearly understood that strong lobing does not constitute separation; the membrane surface must be divided into several discontinuous parts.

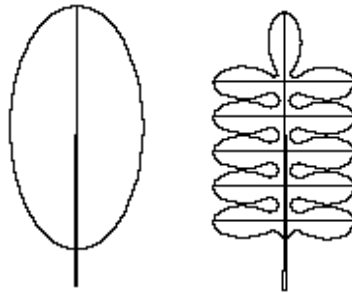
**Frond**—The leaf of a fern.



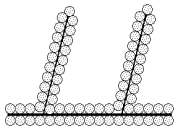
**Pinna** (plural: **pinnae**)—One of the major divisions of a compound frond.

**Pinnule**—One of the major divisions of a compound pinna; a compound frond is made up of “pinnae” and a compound pinna is made up of “pinnules”.

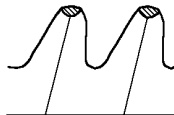
**Simple frond**—A frond which is made up of a single membrane, although the membrane may be complex in shape.



Simple      Simple (with strong lobing)



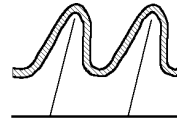
Without Leaf Membrane



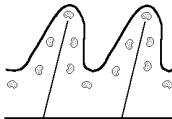
At Lobe or Pinnule Tip



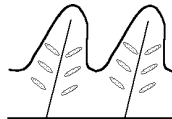
Funnel-shaped



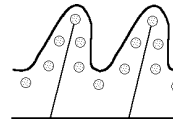
Along Edge



Lima Bean Shaped

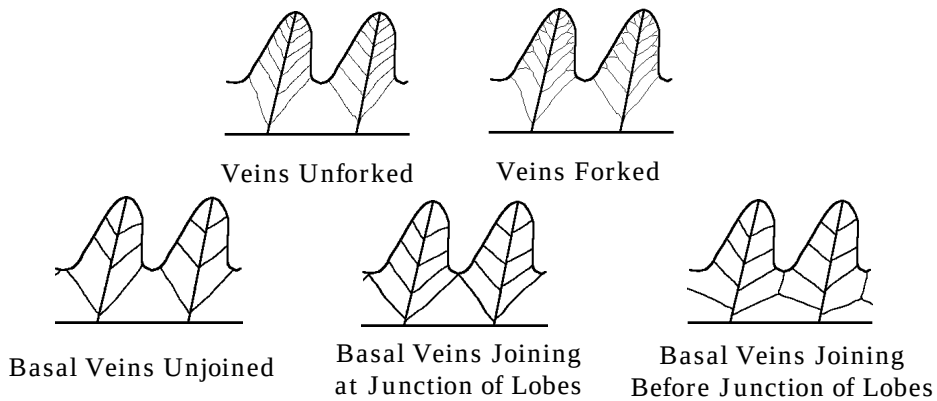


Oval



Round

**Sorus** (plural: **sori**)—A fertile area on a frond, usually along the edge or underside, normally cinnamon brown in color. One frond, pinna, or pinnule often has many sori.



**Veins**—Thickened linear structures within the frond membrane. **Basal veins** are those closest to the axis of the frond. The pattern of the basal veins, and whether the veins are forked or unforked are important characters for the identification of the species of *Thelypteris*.

# Complete Key

The identification method used in this guide is the “dichotomous key”, a technique utilized throughout the field of biology and in other disciplines as well. Such a key consists of pairs of numbered statements, or “couplets”, only one of which is expected to be true for a given fern. Starting with couplet 1, the reader should determine which of the two statements (“a” or “b”) is applicable. Each statement concludes either with a number, an identification of a group of ferns to which the species belongs along with a number, or with the name of the species of fern in question, at which point the task is completed. If the chosen statement ends with a number, the reader should go to the couplet with that number and, once again, choose the appropriate statement. This process is repeated until the identity of the fern is determined.

**1a      Plant aquatic, normally floating on the water surface.....**  
.....***Azolla caroliniana* (Mosquito Fern)**

This tiny plant, *Azolla caroliniana*, is quite unfern-like, and some botanists do not consider it to be a true fern, but rather place it among a closely allied group of plants. It is usually only 1 or 2 cm across, made up of minute red and green rounded plates. The Mosquito Fern is sporadically distributed around the panhandle, entirely covering one small pond, but being absent from others nearby. It may be found floating on the surface of still or slowly moving water bodies, sometimes seeming to thrive even when stranded along muddy shores.



*Azolla caroliniana*  
(after Small, 1931)

**1b      Plant not aquatic .....2**

**2a      Plant growing as a vine, climbing several meters .....**  
.....***Lygodium japonicum* (Japanese Climbing Fern)**

As its name suggests, *Lygodium japonicum*, or the Japanese Climbing Fern, is not native to our region, but was introduced some decades ago. Its attractive foliage

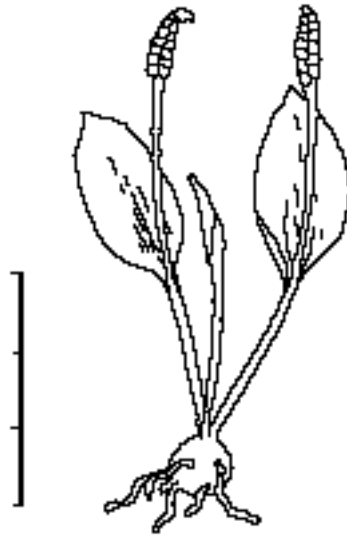
lends itself to use in floral arrangements. This fern is quite tolerant of varying amounts of soil moisture and sunlight, and, as a consequence, may be found in many habitats, ranging from pristine hardwoods forests to vacant city lots. The species is abundant in many areas of the eastern part of the panhandle, and will probably become common throughout our region in the future. As the only panhandle fern in the form of a vine, *L. japonicum* is easily identified; the distinctive shapes of the fertile and sterile fronds are also characteristic.

- 2b      Plant not growing as a vine .....3**
- 3a      Sori clustered in either a separate frond or at the top of a frond, with  
          no associated green leaf membrane..... 4**
- 3b      Sori occurring on green fronds, usually in distinct spots or patches  
          along the edge or lower surface.....15**
- 4a      Fronds simple and unlobed.....(*Ophioglossum*) 5**
- 4b      Fronds compound, or, if simple, then strongly lobed ..... 8**
- 5a      Plants usually less than 10 cm tall, including the fertile spike;  
          broadened membranous portion of the frond less than 2 cm long;  
          round tuber sometimes present at base of plant..... 6**
- 5b      Plants usually more than 10 cm tall, including the fertile spike;  
          broadened membranous portion of the frond usually at least 2.5  
          cm long; base of plant with fleshy roots, but without tuber..... 7**
- 6a      Round tuber present at base of plant; broadened membranous  
          portion of frond relatively broad, about 75% as wide as long.....  
          ..... *Ophioglossum crotalophoroides* (Bulbous Adder's-tongue)**
- 6b      Base of plant with fleshy roots but without round tuber; broadened  
          membranous portion of frond about 50% as wide as long.....  
          .. *Ophioglossum nudicaule* var. *tenerum* (Least Adder's-tongue)**
- 7a      Excepting the midrib, all veins of about the same size; if two sizes of  
          veins present, then spaces enclosed by larger veins not clearly  
          divided into smaller spaces by smaller veins; tip of membranous  
          portion of frond normally blunt .....  
          .....*Ophioglossum petiolatum* (Stalked Adder's-tongue)**
- 7b      Excepting the midrib, two sizes of veins present, with the spaces**



**enclosed by the larger veins clearly divided into 5 to 10 smaller spaces by the smaller veins; tip of membranous portion of frond normally with a distinct sharp protrusion .....  
 .....*Ophioglossum engelmanni* (Engelmann's Adder's-tongue)**

The Adder's-tongues, *Ophioglossum*, are peculiar plants. They are all quite small, and little resemble their closest, more fern-like local relatives, the Rattlesnake and Grapeferns, *Botrychium*. Although one species or another can occasionally be found in various habitats such as woodlands or ever rocky bluffs, they are typically plants of the edges of temporary water bodies. *Ophioglossum* is most likely to be encountered along the margins of broad marshy ditches or along pits dug for road fill material, usually well-concealed by larger grasses, sedges, and other plants. They are probably of widespread occurrence, but their presence normally remains unrecorded because of their size and habitat.



*Ophioglossum crotalophoroides*  
 (after Small, 1931)

- 8a Fronds simple, although strongly lobed (however, the lowermost lobes are sometimes separate, meaning that, technically, the fronds are compound) .....9**
- 8b Fronds clearly compound.....10**
- 9a Edges of lower lobes of fronds wavy; sori-bearing fronds made up of very regular lens-shaped sori about 1 mm across; lowest fronds often separate ..... *Onoclea sensibilis* (Bead Fern)**
- 9b Edges of lower lobes of fronds simple curves; sori-bearing fronds without lens-shaped sori; lowest frond lobes connected to others ..... *Lorinseria areolata* (Netted Chain-fern)**

*Lorinseria areolata* and *Onoclea sensibilis* are quite distinct in appearance from the other ferns in our region, but can readily be confused with each other. The fertile fronds of the two plants, when they are available, do allow easy separation. In the Netted Chain-fern (*L. areolata*), they somewhat resemble the sterile fronds in skeletal form, with broad brown bands of sori along the major veins. The fertile



fronds of the Bead Fern (*O. sensibilis*) are smaller and more compact, and bear distinctive lens-shaped sori. In both species, the fertile fronds often persist over winter, long after the green sterile fronds have died, allowing the use of this feature for identification well into the spring. Nonetheless, during the warmer months, often only sterile fronds are available for inspection. In that instance, the wavy margins of the lowermost frond lobes of *Onoclea* may be compared with the evenly curved margins of *Lorinseria*. In addition, in most plants of *Onoclea*, these lowest lobes are not connected by leaf membrane to the remainder of the frond, but are distinctly separate, a condition not found in *Lorinseria*. It may also be

worth noting that the two ferns are of somewhat differing colors. *Lorinseria* is a medium-green in heavy shade, and is distinctly yellow-green in sunnier locations, whereas *Onoclea* varies from dark-green to medium-green as sunlight exposure increases. The Bead Fern is also capable of reaching a much larger size than the Netted Chain-fern, up to 1 m tall in favorable situations; *Lorinseria* does not exceed 50 cm in height.

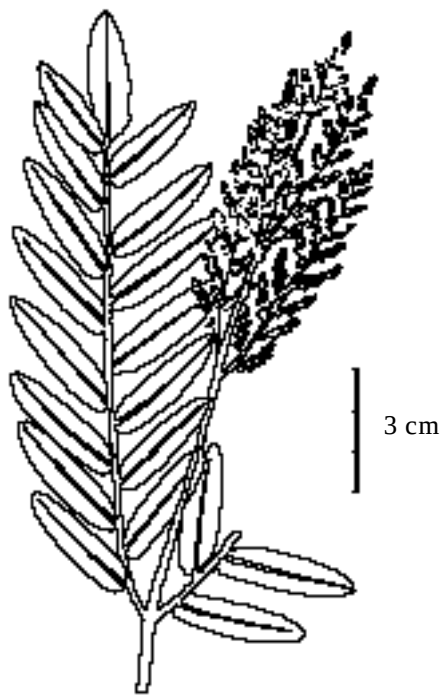
Both plants are common in the panhandle. *Onoclea* appears to favor flood plains, but is also often found in disturbed habitats such as ditches. It seems to prefer soils which range from neutral to basic in acidity. *Lorinseria*, along with *Osmunda cinnamomea*, is a preeminent fern in our area in acidic soils, often forming extensive colonies in semi-open swamp and bog habitats. It, too, can often be found in disturbed areas, and the Bead Fern and Netted Chain-fern are not uncommonly found together in such places.

*Onoclea* is often referred to as the “Sensitive Fern”—really a translation of its Latin name rather than a reference to any particular feature of the plant. The logic behind the choice of scientific names for this fern is unclear.

- 10a Sori clustered at the top of a frond, which is otherwise green .....  
.....*Osmunda regalis* var. *spectabilis* (Royal Fern)  
10b Sori either making up a separate frond which is entirely brown, or  
appearing to do so (although actually only a branch of a frond),  
in either case not at the tip of a frond..... 11  
11a Plant large, over 1 m tall *Osmunda cinnamomea* (Cinnamon Fern)

The Cinnamon Fern, *Osmunda cinnamomea*, is abundant in our region. It is a large and conspicuous fern, especially after the cinnamon-brown spore-bearing fronds have been formed, often reaching 1.5 m tall. This species is tolerant of quite open conditions, and appears to be particularly well adapted to acidic soils, although it can also be found growing in shaded locations and in neutral soils. It tends to out compete all other panhandle ferns in open, boggy situations, forming dense colonies in such habitats.

In the absence of fertile parts, *O. cinnamomea* is extremely hard to differentiate from two other common Florida Panhandle species, the Giant Chain Fern (*Woodwardia virginica*), and the Sword Fern (*Dryopteris ludoviciana*), even though these ferns are only distantly related. There are some characteristics, however, that are usually helpful in separating these three species, even in sterile plants. The upper surfaces of the fronds of *D. ludoviciana* are distinctly



*Osmunda regalis*  
(after Small, 1931)

shiny, different from the more typically fern-like dull appearance of the other two species. In *W. virginica*, the stems of the fronds tend to be quite dark, purple to black, whereas the stems of *O. cinnamomea* and *D. ludoviciana* are green to light brown. Finally, the lower surfaces of the fronds of *W. virginica* have a silvery sheen unlike the plain light-green coloration of the other two ferns, and careful observation will disclose veins in a chain-pattern along the mid-line of each leaflet.

**11b Plant small, less than 70 cm tall, and often less than 20 cm tall.....  
.....(*Botrychium*) 12**

**12a Green portion of frond attached directly to the stem of the brown sori-bearing portion, or with a very short stem (5 mm or less in length); green frond membrane quite thin and not fleshy or leathery ..... *Botrychium virginianum* (Rattlesnake Fern)**

**12b Green portion of frond with a comparatively larger stem (1 cm long or longer), attachment to brown sori-bearing portion being near ground level; green frond membrane relatively thick and fleshy or leathery ..... 13**

**13a Green portion of frond more-or-less parallel to ground with a short stem (about 1 cm); central veins of smallest divisions ("pinnules") of green portion of frond either absent or very poorly developed; often with several fronds.....  
..... *Botrychium lunarioides* (Winter Grapefern)**

**13b Green portion of frond held at about a 45° angle to the ground and with a stem usually several centimeters long; central veins of smallest divisions of green portion of frond well developed; rarely with more than one frond .....14**

**14a Frond finely divided, often triply compound; smallest divisions somewhat angular, appearing rhomboidal.....  
..... *Botrychium dissectum* (Common Grapefern)**

**14b Frond more coarsely divided, usually doubly compound; smallest divisions rounded in shape .....  
..... *Botrychium biternatum* (Southern Grapefern)**

Of the four species of *Botrychium* mentioned above, only *B. virginianum* is clearly separated. Botanists disagree regarding the distinctness of the other species, and regarding how many kinds there actually are. Intermediates are well known, and are sometimes given names as hybrids. One of these is recorded from Gadsden County—*B. alabamense* or *B. jenmanni*, supposedly a hybrid between *B. lunarioides* and *B. biternatum*.



*Botrychium biternatum* (after Small, 1938)

All of our species of *Botrychium* seem to be mostly confined to well-shaded hardwoods, where they may be found as a few scattered individuals. This tendency of occurring in small numbers, combined with their relatively diminutive size, makes them quite inconspicuous components of our flora. Only the Rattlesnake Fern reaches any significant size in our region, and it rarely exceeds 40 cm in height. The other species of *Botrychium* are typically 20 cm tall or less. The Winter Grapefern, *B. lunarioides*, is well-named and noteworthy for flourishing in mid-winter when other ferns have long vanished from the forest floor.

**15a Fronds simple and strongly lobed or singly compound, feather-like in structure, with the individual pinnae being undivided and unlobed although often with fine saw-toothed edges ..... 16**

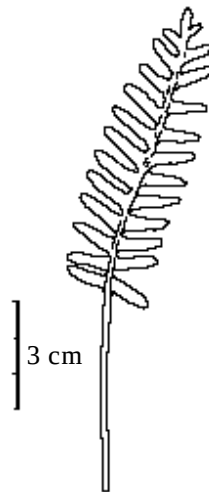
- 15b Fronds doubly or more compound, or, if singly compound, with strongly lobed pinnae .....24**
- 16a Fronds simple and strongly lobed, growing on sabal palm .....  
..... *Phlebodium aureum* (Golden Polypody)**  
The fronds of *Phlebodium aureum* are somewhat similar to those of *Lorinseria areolata* or *Onoclea sensibilis*. The Golden Polypody, however, has sori occurring on its normal fronds, rather than having specialized fertile and sterile fronds. It is really a tropical plant, found growing on palm trees at a single location in our area, on an island along the coast of Franklin County.
- 16b Fronds singly compound, growing on the ground or on various kinds of trees ..... 17**
- 17a Sori forming a continuous thin line along the edge of the underside of the pinnae, covered by the infolded edge of the pinna .....  
..... *Pteris vittata* (Ladder Brake)**  
*Pteris vittata* is not native to the panhandle, but is an introduced species. It is a medium-sized (to about 60 cm tall) fern with leathery fronds. The only location in our area at which it has been found is beneath a bridge in Jefferson County, where a few plants grow in the drier soil near the ends of the bridge.
- 17b Sori in the form of distinct spots on the lower frond surface..... 18**
- 18a Sori round, kidney shaped, or broadly oval, no more than twice as long as wide..... 19**
- 18b Sori in the form of elongated ovals, more than twice as long as wide .....(*Asplenium*) 22**
- 19a Sori often kidney shaped; fronds light green; frond membrane thin, not leathery ..... (*Nephrolepis*) 20**
- 19b Sori round to broadly oval; fronds dark green and leathery ..... 21**
- 20a Plant often bearing tubers; pinnae with rounded or only bluntly pointed tips; scales at the base of the stem light colored with dark points of attachment .....  
..... *Nephrolepis cordifolia* (Tuberous Boston Fern)**
- 20b Plant never bearing tubers; pinnae with sharply pointed tips; scales at base of stem more-or-less all one color.....  
..... *Nephrolepis exaltata* (Common Boston Fern)**

Boston Ferns (*Nephrolepis*) are widely recognized due to the popularity of these durable ferns as house plants. Neither the Common Boston Fern (*N. exaltata*) nor the Tuberous Boston Fern (*N. cordifolia*) are native to our region, and these plants are only found naturalized in scattered urban areas of the panhandle. *N. exaltata* is, however, native to south and central Florida, where it is common and widespread. *N. cordifolia* is also relatively common in the southern parts of the state, but probably as a result on naturalization.

Both species are quite adaptable, and thrive in varied habitats ranging from vacant lots to the crowns of palm trees where they grow in the spaces between the old leaf bases and the trunk. The tubers found only on *Nephrolepis cordifolia*, small greenish spherical objects about 2 cm in diameter, offer a positive identification guide. Although Nauman (1981) indicates that they are not found on ferns growing in trees, this does not seem to hold true in the panhandle where Leon County specimens with tubers may be seen growing in an introduced palm tree. In the absence of tubers, one must rely on the other characters mentioned above in the key.

**21a Plant small, less than 15 cm tall; growing in trees, particularly along the upper surfaces of relatively horizontal live oak branches ....  
... *Polypodium polypodioides* var. *michauxianum* (Resurrection Fern)**

Although found on other trees as well, *Polypodium polypodioides* is a normal feature on the spreading branches of the live oak, *Quercus virginiana*, through the panhandle. Sometimes small patches of the little (less than 15 cm tall) fern are found of the forest floor, surviving after their original branch fell to the ground and decayed. They may rarely be seen growing on old stone walls or other rock surfaces. The habitat of this plant, devoid of the usual moist earth which one tends to associate with ferns, requires the ability to tolerate substantial drought conditions. When droughts occur, it withers and shrinks, soon appearing dead; only a light rain, however, is needed to bring it back to full health—whence the common name, Resurrection Fern. (The scientific name of this abundant plant, incidentally, is not only the least pronounceable of our ferns, but is one of the silliest as well. It means “the *Polypodium* which looks like a *Polypodium*”—not the fault of



*Polypodium polypodioides* var. *michauxianum*  
(after Small, 1931)

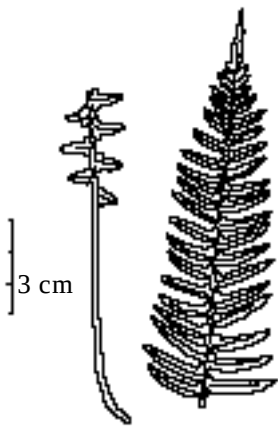
the original describer, but rather the unavoidable result of reclassifying it.)

**21b Plant large, more than 25 cm tall; growing on the ground .....  
 .....*Polystichum acrostichoides* (Christmas Fern)**

**22a Plant large, more than 25 cm tall; two rows of pinnae staggered, with  
 the individual pinnae not opposite one another across the mid-  
 rib; bases of pinnae enlarged so that they lie across the midrib;  
 growing on the ground .....  
 .....*Asplenium platyneuron* (Ebony Spleenwort)**

**22b Plant usually less than 25 cm tall; two rows of pinnae matching so  
 that the individual pinnae are opposite one another across the  
 midrib; bases of pinnae not lying across the midrib; normally  
 found growing on limestone surfaces..... 23**

Three of our four species of *Asplenium* are of very localized distribution, and are rarely encountered. The Ebony Spleenwort, *A. platyneuron*, however, is a very



*Asplenium platyneuron*  
 (after Small, 1931)

common and quite adaptable plant. This fern is characteristic of mixed hardwoods forest, along the upper margins of floodplains, growing in scattered clumps. It may be regularly seen, though, in other situations, ranging from limestone bluffs to urban yards. *Asplenium platyneuron* appears to grow best in soils of only moderate moisture content in areas of light shade, and it is absent from the dark moist forest habitats in which many of our other ferns thrive. This fern varies considerably not only in the growing conditions under which it is found, but also in its growth habits; commonly it is a relatively dainty plant reaching about 25 cm in height, but in other situations it easily grows to twice that size. Larger specimens tend to have pinnae disproportionately long and coarse, and such plants are recognized by Wherry (1964), but not by most other

authors, as a distinct variety, *Asplenium platyneuron* var. *bacculum-rubrum*.

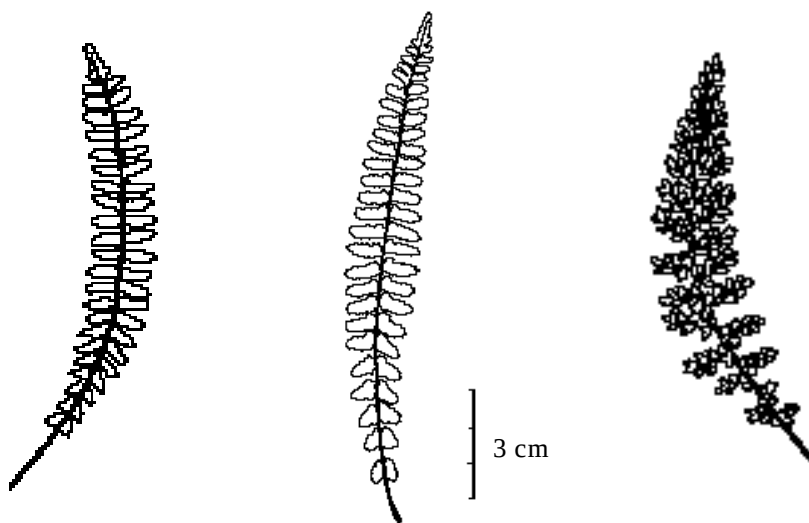
The Ebony Spleenwort can be readily separated from the only two similar local species, the Blackstem Spleenwort (*Asplenium resiliens*) and the Varicolored Spleenwort (*A. heterochroum*), on the basis of several characteristics. It is often a



substantially larger fern, and the pinnae are arranged alternately on the stem rather than opposite one another. Also, the pinnae bases are expanded sufficiently to broadly overlap the stem; not the case in the two other species. Finally, *A. platyneuron* tends to have two types of fronds: large, erect, fertile ones, and small, almost prostrate, sterile ones. The fronds of both *A. resiliens* and *A. heterochroum* are of only one type.

- 23a Entire edge of pinna irregular, somewhat saw-toothed.....**  
**.....*Asplenium heterochroum* (Varicolored Spleenwort)**
- 23b Edge of pinna smooth and even, or with upper edge (towards the top of the fern) somewhat saw-toothed.....**  
**..... *Asplenium resiliens* (Blackstem Spleenwort)**

At first glance, both the Blackstem Spleenwort (*Asplenium resiliens*) and the Varicolored Spleenwort (*A. heterochroum*) look like small specimens of the Ebony Spleenwort (*A. platyneuron*). On closer examination, however, the differences



*Asplenium resiliens*, left, *A. heterochroum*, center, and  
*A. myriophyllum*, right (after Small, 1931)

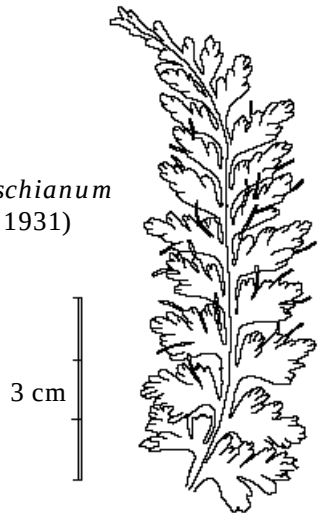
already noted are clear. In addition, the habitat of the two smaller species, which normally only reach about 25 or 30 cm in height, is distinctive. They are only found on limestone surfaces in the panhandle, unlike *A. platyneuron* which requires soil around its roots. The Ebony Spleenwort may often be found in the same locality as its smaller relatives, but not actually growing on the rock surface.

Both *Asplenium resiliens* and *A. heterochroum* are rare ferns in our region, limited by a scarcity of suitable habitat, and usually very sparsely present even there. They are difficult to tell apart. The most reliable guide to identification is the nature of the margin of the pinnae. In *A. heterochroum* the pinna edge is sharply toothed, while in *A. resiliens* the pinna edge is either linear or has small waves or crenellations which are not sharply pointed. A hybrid between these two species, *A. heteroresiliens*, has been reported from Gadsden County, but would seemingly be extremely hard to identify as such.

- 24a    Sori in the form of small funnels, with the large end directed outwards at the sinuses between frond lobes and with a single large bristle protruding from the mouth of each sorus.....**  
**.....*Trichomanes boschianum* (Bristle Fern)**

This delicate and unusual fern is only doubtfully present in our area. Several authors note that it possibly occurs here, but no authentic records are available. Its preferred habitat is a constantly moist rock face of non-calcareous composition—not a common situation in Florida.

*Trichomanes boschianum*  
 (after Small, 1931)



- 24b    Sori not funnel-shaped and without protruding bristles..... 25**

- 25a Fronds doubly compound with pinnules similar to fingernails in size and shape although split partway to the stem in a number of places; stems wiry and shiny black; sori at the underside tips of pinnules, covered by the infolded tip.....  
..... *Adiantum capillus-veneris* (Southern Maidenhair Fern)
- 25b Fronds variously compound, singly compound with deeply lobed pinnae in many species; stems, although sometimes dark colored, not wiry and shiny black; sori either forming a more-or-less continuous line along the edge of the underside of the pinnae, or in the form of distinct spots on the lower frond surface..... 26
- 26a Sori in the form of a more-or-less continuous line along the edge of the underside of the pinnae, often covered by the infolded edge of the pinna ..... 27
- 26b Sori in the form of distinct spots on the lower frond surface, not usually covered by the infolded edge of the pinna ..... 31
- 27a Sori covered by infolded edge of the pinna ..... 28
- 27b Sori not covered by infolded edge of the pinna..... 30
- 28a Fronds doubly or triply compound.....  
..... *Pteridium aquilinum* var. *pseudocaudatum* (Bracken)
- 28b Fronds with a terminal portion consisting of five pinnae with approximately the same point of origin ..... 29
- 29a Fronds with only the terminal five pinnae, or with one or two additional pairs of pinnae below the terminal portion .....  
..... *Pteris cretica* (Cretan Brake)

The Cretan Brake, *Pteris cretica*, is a medium-sized fern (ranging from about 30 cm to 50 cm in height) of limestone regions, growing in pockets of limestone rubble and soil or directly on the rock. This species is found in many tropical areas of the world, and its origins in Florida are problematic. Both Clewell (1985) and Lakela and Long (1976) state that the fern is an introduction. On the contrary, Small (1938) indicates that “there seems to be little doubt that it is indigenous”. There are good reasons to suspect that *Pteris cretica* was introduced to our area: it is known to be easily introduced and has become artificially widespread elsewhere, its closest

relatives probably live in Asia, and it is widely grown for horticultural purposes. Small, however, also has several strong arguments: the Cretan Brake is not an urban fern in our region, but is most commonly found in relatively inaccessible wild areas, and it was first found growing in Florida about 1838, substantially before exotic ferns were common horticultural subjects in the state.

- 29b Fronds with at least four pairs of pinnae below the terminal portion ..... *Pteris multifida* (Spider Brake)**
- 30a Upper half of fronds singly compound with unlobed pinnae ..... *Pellaea atropurpurea* (Cliff-brake)**
- 30b Upper half of fronds singly compound with strongly lobed pinnae ..... *Cheilanthes microphylla* (Southern Lip-fern)**
- 31a Sori oval, at least twice as long as wide..... 32**
- 31b Sori round, kidney shaped, or broadly oval, less than twice as long as wide ..... 35**
- 32a Sori approximately twice as long as wide, one per pinnule..... *Asplenium myriophyllum* (Lacy Spleenwort)**
- 32b Sori much more than twice as long as wide, several per pinnule.... 33**
- 33a Sori aligned end-to-end in two closely parallel rows along the central vein of each pinnule ..... *Woodwardia virginica* (Giant Chain-fern)**
- 33b Sori within each row in an echelon formation, the sori in the two parallel rows at 45° to 90° angles to one another, forming a series of “V” shapes ..... 34**

*Woodwardia virginica*, the Giant Chain-fern, is a large and attractive plant. The characteristically dark-colored stems contrast nicely with the medium-green fronds. The fern reaches a height of up to about 1.5 m, although 1 m is more usual in our area. It is widely distributed in the panhandle, but is of quite sporadic occurrence, being found in only a relatively small proportion of what seem to be suitable habitats—moist, moderately shaded hardwoods forests. The Giant Chain-fern can sometimes be found in disturbed areas, beneath bridges for example. The common name, incidentally, refers to the chain-like appearance of the rows of sori. The techniques for separating non-fertile specimens of this plant from the very

similar species, *Osmunda cinnamomea* and *Dryopteris ludoviciana*, have already been discussed under *Osmunda*.

- 34a     Fronds doubly compound; pinnules with saw-toothed margins .....  
                  ...*Athyrium filix-femina* var. *asplenioides* (Southern Lady-fern)**
- 34b     Fronds singly compound; pinnae divided into blunt lobes .....  
                  ..... *Diplazium japonicum* (Japanese Lady-fern)**
- 35a     Sori broadly oval, one per pinnule.....  
                  ..... *Asplenium myriophyllum* (Lacy Spleenwort)**
- 35b     Sori round or kidney shaped, several per pinnule ..... 36**
- 36a     Sori partially or entirely covered by several (usually 4 to 7) strips of  
                  tissue arising from beneath each sorus .....  
                  ..... *Woodsia obtusa* (Cliff Fern)**
- 36b     Sori either not covered or covered by a single tissue lobe ..... 37**
- 37a     Sori-bearing pinnae with obviously narrower lobes than other  
                  pinnae; fronds dark green with the upper surface smooth and  
                  shiny.....*Dryopteris ludoviciana* (Sword Fern)**  

One may occasionally see, scattered among plants of the Cinnamon Fern (*Osmunda cinnamomea*) in hardwoods bottomland, certain ferns of the same size and appearance, but with shiny dark-green leaves. These are *Dryopteris ludoviciana*, the Sword Fern, one of our larger and more attractive species. The narrow lobes of the sori-bearing pinnae at the ends of the fronds, distinctly different from the wider lobes of the sterile pinnae, are characteristic. Early in the spring, prior to sori development, they are easily confused with either *O. cinnamomea* or with *Woodwardia virginica*. Methods of distinguishing these plants were discussed above, under *Osmunda*.
- 37b     Sori-bearing pinnae similar in form to other pinnae; fronds usually  
                  light green with the upper surface dull and often fuzzy.....  
                  ..... (*Thelypteris*) 38**
- 38a     Fronds doubly compound with strongly lobed pinnules .....  
                  ..... *Thelypteris torresiana* (Mariana Maiden Fern)**
- 38b     Fronds either singly compound with strongly lobed pinnae, or**

**appearing that way but with “pinnae” connected by narrow strips of leaf membrane along the stem of the frond ..... 39**

*Thelypteris torresiana* is a very large plant, with fronds up to about 1.5 m long. The doubly compound nature of the fronds makes them quite different from any other local species in the genus. Indeed, the pinnae of the Mariana Maiden Fern look rather like entire fronds of some other species of *Thelypteris*. This is not a native species, and the common name derives from the fern’s occurrence on the Mariana Islands rather than to the county seat of Jackson County. As is typical of many of our other introduced ferns, *T. torresiana* is found unpredictably and sporadically, presumably because it has not yet had time to spread to all of the suitable habitat available to it. As of the writing, it is not particularly common.

- 39a     Lowermost “pinnae” substantially longer than others, resulting in a broad triangular shape to the fronds; major divisions of frond usually connected together by narrow strips of leaf membrane along the stem of the frond .....  
..... *Thelypteris hexagonoptera* (Beech Fern)**
- 39b     Lowermost pinnae either shorter than or, at most, of the same length as the centrally located pinnae, giving the fronds an elongated oval or broad sword shape; pinnae not connected together ..... 40**

*Thelypteris hexagonoptera*, the Beech Fern, is essentially a northern plant. It reaches the southern limit of its range in the panhandle, where it seems to be restricted to the “relict” areas along the northern edge of the eastern part of our region—a distribution common to many other organisms as well. This small *Thelypteris*, less than 40 cm tall, may be found in a few scattered clumps in moist hardwoods forests, often in quite calcareous soil, and is rarely common even in seemingly ideal situations. It can easily be recognized by the very large lowermost pinnae which extend at an angle to the other pinnae.

- 40a     Veins closest to the main frond axis (basal veins) in adjacent lobes of a pinna joining together before reaching the junction between the lobes ..... 41**
- 40b     Basal veins in adjacent lobes either reaching the junction between**

- the lobes without joining, or joining just as the junction is reached ..... 43
- 41a Basal lobes (the pair of lobes closest to the stem or midrib of the frond) of each pinna the same size as those further from the stem; lowermost pair of pinnae the same length as the centrally located pinnae; undersides of pinnae smooth with no hairs .....  
..... *Thelypteris interrupta* (Interrupted Shield-fern)
- 41b Basal lobes of each pinna somewhat enlarged in comparison to those further from the stem; lowermost pair of pinnae usually obviously shorter than the centrally located pinnae; undersides of pinnae fuzzy ..... 42
- 42a At least two, and as many as six lower pairs of pinnae reduced in length compared to the centrally located pinnae; stem below the frond often purplish; joined portion of basal veins in adjacent lobes of a pinna about as long as, or longer than the unjoined portion ..... *Thelypteris dentata* (Downy Shield-fern)
- 42b No more than two lower pairs of pinnae reduced in length compared to the centrally located pinnae; stem below the frond often straw-colored; joined portion of basal veins in adjacent lobes of a pinna shorter than unjoined portions.....  
*Thelypteris quadrangularis* var. *versicolor* (Versicolored Shield-fern)
- 43a Base of stem black; most veins in each lobe of a pinna forking; midrib of frond smooth, with few or no hairs .....  
..... *Thelypteris palustris* (Marsh Fern)
- 43b Base of stem straw-colored, purplish, or brown; few or (usually) no veins in each lobe of a pinna forking; midrib of frond often quite fuzzy, although not always so.....44

The reader may note that *Thelypteris quadrangularis* var. *versicolor* occurs twice in this key, above and below. This is because the characteristics of the basal veins in adjacent lobes are quite variable in that fern. I should also warn anyone attempting to identify species of *Thelypteris* that *T. quadrangularis* var. *versicolor*, *T. ovata*, and *T. kunthii* are quite difficult to separate. The following two couplets

represent the best summary I could devise of the supposed distinctive features of these plants.

- 44a**     **Upper surface of frond, including leaf membrane, quite fuzzy, with numerous hairs; often, but certainly not always, with some basal veins of adjacent pinna lobes joining together.....**  
***Thelypteris quadrangularis* var. *versicolor* (Versicolored Shield-fern)**
- 44b**     **Upper surface of leaf membrane with few or no hairs, although midribs of frond, pinnae, and pinnae lobes may be fuzzy; basal veins of adjacent pinna lobes not joining together..... 45**
- 45a**     **Lowermost pair of pinnae the same length as the centrally located pinnae; hairs along the midribs of frond, pinnae, and pinnae lobes relatively long, mostly greater than 0.3 mm in length .....**  
**..... *Thelypteris kunthii* (Southern Shield-fern)**
- 45b**     **Lowermost pair of pinnae obviously shorter than the centrally located pinnae; hairs along midribs of frond, pinnae, and pinnae lobes, when present, relatively short, mostly less than 0.2 mm in length .....**  
***Thelypteris ovata* (Harper's Shield-fern)**

There are several records for the tropical fern, *Thelypteris augescens*, from our area, from Liberty County (Correll, 1938) and Jackson County (Mitchell, 1963). The Mitchell record, at least, seems to be based on a misidentification of *Thelypteris kunthii*. If *T. augescens* is present in the panhandle it is quite rare.



## Rapid Key

As noted in the introduction, this portion of the handbook is designed to allow someone with little familiarity with ferns or with botanical nomenclature to identify all of the kinds of ferns normally encountered in the Florida panhandle. Before using this key, one should be familiar with the handful of terms defined in the glossary, and should have read the prefatory material to the complete key which explains the use of keys. Illustrations of some of the plants listed here, along with additional information, are contained in the complete key, and this should be consulted after you have tentatively identified a fern using this key.

- |    |                                                                                                                                                        |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 1a | Plant aquatic, normally floating on the water surface.....                                                                                             |   |
|    | ..... <i>Azolla caroliniana</i> (Mosquito Fern)                                                                                                        |   |
| 1b | Plant not aquatic .....                                                                                                                                | 2 |
| 2a | Plant growing in trees, particularly along the upper surfaces of relatively horizontal live oak branches .....                                         |   |
|    | ..... <i>Polypodium polypodioides</i> (Resurrection Fern)                                                                                              |   |
| 2b | Plant terrestrial .....                                                                                                                                | 3 |
| 3a | Plant growing as a vine, climbing several meters .....                                                                                                 |   |
|    | ..... <i>Lygodium japonicum</i> (Japanese Climbing Fern)                                                                                               |   |
| 3b | Plant not growing as a vine .....                                                                                                                      | 4 |
| 4a | Sori-bearing fronds entirely brown, without any green leaf membrane .....                                                                              | 5 |
| 4b | Sori occurring on green fronds.....                                                                                                                    | 7 |
| 5a | Fronds simple, although strongly lobed (however, the lowermost lobes are sometimes separate, meaning that, technically, the fronds are compound) ..... | 6 |
| 5b | Fronds singly compound, with the individual pinnae being strongly lobed.....                                                                           |   |
|    | ..... <i>Osmunda cinnamomea</i> (Cinnamon Fern)                                                                                                        |   |
| 6a | Edges of lower lobes of fronds wavy; sori-bearing fronds made up of very regular lens-shaped sori about 1 mm across; lowest frond                      |   |

- lobes often separate ..... *Onoclea sensibilis* (Bead Fern)
- 6b Edges of lower lobes of fronds simple curves; sori-bearing fronds without lens-shaped sori; lowest frond lobes connected to others ..... *Woodwardia areolata* (Netted Chain-fern)
- 7a Fronds singly compound, feather-like in structure, with the individual pinnae being undivided and unlobed although often with fine saw-toothed edges.....8
- 7b Fronds either doubly or triply compound, or, if singly compound, with strongly lobed pinnae .....9
- 8a Sori individually round in shape, more-or-less covering the lower surfaces of the pinnae which make up about the upper one-third of the fronds; absent from other pinnae .....  
.....*Polystichum acrostichoides* (Christmas Fern)
- 8b Sori in the shape of elongated ovals, usually two or three times as long as wide, depending on their degree of maturity; occurring on the pinnae making up about the upper three-quarters of the fronds.....*Asplenium platyneuron* (Ebony Spleenwort)
- 9a Sori-bearing pinnae entirely brown and clustered at the tip of the fronds, without any green leaf membrane; fronds doubly compound with simple pinnules.....  
.....*Osmunda regalis* var. *spectabilis* (Royal Fern)
- 9b Sori-bearing pinnae similar to other pinnae, consisting of green leaf membrane with brown sori on the under surface; fronds of various types..... 10
- 10a Fronds appearing either doubly compound with strongly lobed pinnules or triply compound; sori forming a continuous thin line along the edge of the underside of the pinnules .....  
..... *Pteridium aquilinum* var. *pseudocaudatum* (Bracken)
- 10b Fronds either singly compound with strongly lobed pinnae or doubly compound with simple pinnules; sori in the form of discrete spots, either round, oval, or Lima bean shaped ..... 11
- 11a Sori round or Lima bean shaped .....12

- 11b Sori oval, usually at least twice as long as wide..... 13
- 12a Sori-bearing pinnae with obviously narrower lobes than other pinnae; fronds dark green with the upper surface smooth and shiny.....*Dryopteris ludoviciana* (Sword Fern)
- 12b Sori-bearing pinnae similar in form to other pinnae; fronds light green with the upper surface dull and often fuzzy.....  
..... *Thelypteris* spp. (Shield-ferns)
- 13a Sori aligned end-to-end in two closely parallel rows along the central vein of each pinnule .....  
..... *Woodwardia virginica* (Virginia Chain-fern)
- 13b Sori within each row in an echelon formation, the sori in the two parallel rows at 45° to 90° angles to one another, forming a series of “V” shapes ..... 14
- 14a Fronds doubly compound; pinnules with saw-toothed margins .....  
...*Athyrium filix-femina* var. *asplenioides* (Southern Lady-fern)
- 14b Fronds singly compound; pinnae divided into blunt lobes .....  
..... *Diplazium japonicum* (Japanese Lady-fern)

## Check-list

All of the Panhandle ferns are listed below, arranged according to one scheme of classification. Ferns are exceptional for the amount of disagreement that exists among students of the group as to how these plants are interrelated, and, accordingly, as to how they should be classified. I have chosen a conservative approach, essentially the same as that used by Wherry (1964) and by Clewell (1985). The very large family containing the most advanced ferns, the Polypodiaceae, is particularly troublesome in this regard. There is little doubt that it comprises an assemblage of sometimes only distantly related plants. Equally, it is clear that the family as presently recognized is so large as to be unwieldy as an intellectual tool. Unfortunately, there is no clear agreement as to how it should be broken up or subdivided. The interested reader may wish to consult Lakela and Long (1976) for another arrangement.

This disagreement and uncertainty also includes classification at the more immediate working level, genera and species. If one is unaware of some of the intricacies and convolutions of fern nomenclature, merely trying to locate a common plant in several different guide books is likely to be frustrating. For this reason, I have included in lighter print the various alternate names used by the authors of guides particularly useful to our region. The references in such cases are abbreviated as: "Cl" = Clewell (1985), "LL" = Lakela and Long (1976), "MP" = McVaugh and Pyron (1951), "S1" = Small (1931), "S2" = Small (1938), and "Wh" = Wherry (1964)

### **Ophioglossaceae**

#### ***Ophioglossum crotalophoroides* T. Walter**

*Ophioglossum crotalophoroides* + *O. mononeuron* [S2, Wh]

#### ***Ophioglossum engelmanni* K. Prantl**

#### ***Ophioglossum nudicaule* C. von Linné, Jr. var. *tenerum* (G. Mettenius) R. Clausen**

*Ophioglossum nudicaule* [Cl, MP]

*Ophioglossum tenerum* [S1]

*Ophioglossum tenerum* + (?) *O. pumilio* + *O. dendroneuron* [S2]

*Ophioglossum tenerum* + *O. dendroneuron* [Wh]

#### ***Ophioglossum petiolatum* W. J. Hooker**

*Ophioglossum floridanum* [S2]

#### ***Botrychium biternatum* (M. Savigny) L. Underwood**

*Botrychium dissectum* var. *tenuifolium* [MP]  
*Botrychium obliquum* [S1]  
*Botrychium biternatum* + *B. obliquum* [S2, Wh]  
***Botrychium dissectum* K. Sprengel**  
*Botrychium dissectum* var. *dissectum* [LL]  
***Botrychium jenmanni* L. Underwood**  
*Botrychium* X *alabamense* [LL, Wh]  
***Botrychium lunarioides* (A. Michaux) O. Swartz**  
*Botrychium alabamense* [MP, S2]  
***Botrychium virginianum* (C. von Linné) O. Swartz**  
*Osmundopteris virginiana* [S2]

#### **Osmundaceae**

***Osmunda cinnamomea* C. von Linné**  
***Osmunda regalis* C. von Linné var. *spectabilis* (K. Willdenow)**  
**A. Gray**  
*Osmunda regalis* [MP, S1, S2]

#### **Schizaeaceae**

***Lygodium japonicum* (C. Thunberg) O. Swartz**

#### **Salviniaceae**

***Azolla caroliniana* K. Willdenow**

#### **Hymenophyllaceae**

***Trichomanes boschianum* J. Sturm**

#### **Polypodiaceae**

***Polypodium polypodioides* (C. von Linné) D. Watt var.**  
***michauxianum* C. Weatherby**  
*Polypodium polypodioides* [Cl, MP, S1, Wh]  
*Marginaria polypodioides* [S2]  
***Phlebodium aureum* (C. von Linné) J. Smith**  
***Onoclea sensibilis* C. von Linné**  
***Woodsia obtusa* (K. Sprengel) J. Torrey**  
***Thelypteris dentata* (P. Forsskål) E. St. John**  
*Dryopteris dentata* [MP, S1]

*Cyclosorus dentata* [Wh]  
***Thelypteris hexagonoptera* (A. Michaux) C. Weatherby**  
*Dryopteris hexagonoptera* [MP, S1]  
*Phegopteris hexagonoptera* [S2, Wh]  
***Thelypteris interrupta* (K. Willdenow) Z. Iwatsuki**  
***Thelypteris kunthii* (N. Desvaux) C. Morton**  
*Thelypteris normalis* [LL, S1]  
*Dryopteris normalis* [MP]  
*Thelypteris normalis* + *T. saxatilis* + *T. unca* [S2]  
*Thelypteris* “*macrorrhizoma*” + *T. normalis* + *T. “saxatilis”* + *T. “unca”*[Wh]  
***Thelypteris ovata* R. St. John**  
*Thelypteris ovata* + *T. ovata harperi* [S2]  
*Thelypteris normalis* var. *harperi* [Wh]  
***Thelypteris palustris* H. Schott**  
*Dryopteris thelypteris* [MP, S1]  
*Thelypteris thelypteris* [S2]  
***Thelypteris quadrangularis* (A. Fée) E. Schelpe var. *versicolor* (R. St. John) A. R. Smith**  
*Thelypteris* “*macilenta*” + *T. versicolor* [S2]  
*Cyclosorus quadrangularis* + *Thelypteris* “*macilenta*” + *T. X versicolor* [Wh]  
***Thelypteris torresiana* (C. Gaudichaud-Beaupri) A. Alston**  
***Diplazium japonicum* (C. Thunberg) R. Beddome**  
***Athyrium filix femina* (C. von Linné) A. Roth var. *asplenioides* (A. Michaux) A. A. Eaton**  
*Athyrium filix-femina* [Cl, MP]  
*Athyrium asplenioides* [LL, S1, S2, Wh]  
***Polystichum acrostichoides* (A. Michaux) H. Schott**  
***Dryopteris ludoviciana* (G. Kunze) J. Small**  
*Dryopteris floridana* [S1]  
***Lorinseria areolata* (C. von Linné) K. Presl**  
*Woodwardia areolata* [Cl, LL]  
***Woodwardia virginica* (C. von Linné) J. Smith**  
*Anchistea virginica* [MP, S1, S2]  
***Asplenium heterochroum* G. Kunze**  
***Asplenium myriophyllum* (O. Swartz) K. Presl**

*Asplenium X verecundum* [LL]  
*Asplenium verecundum* [S1, S2, Wh]  
***Asplenium platyneuron* (C. von Linné) W. Oakes**  
***Asplenium resiliens* G. Kunze**  
***Adiantum capillus-veneris* C. von Linné**  
***Pellaea atropurpurea* (C. von Linné) J. Link**  
*Pellaea atropurpurea* var. *atropurpurea* [LL]  
***Pteris cretica* C. von Linné**  
*Pycnodoria cretica* [S1, S2]  
***Pteris multifida* J. Poiret**  
*Pycnodoria multifida* [S2]  
***Pteris vittata* C. von Linné**  
*Pycnodoria vittata* [S1, S2]  
***Cheilanthes microphylla* (O. Swartz) O. Swartz**  
***Nephrolepis cordifolia* (C. von Linné) K. Presl**  
***Nephrolepis exaltata* (C. von Linné) H. Schott**  
***Pteridium aquilinum* (C. von Linné) M. Kuhn**  
*Pteridium aquilinum* var. *pseudocaudatum* [MP]  
*Pteris latiuscula* [S1, S2]  
*Pteridium aquilinum* vars. *pseudocaudatum* + *latiuscula* [Wh]

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