A Wonderland of Ferns: Sharing a Piece of Land with Twenty-four Native Species

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It's funny what direction life can take you. Sometimes it's the most seemingly innocuous things which end up having a major transformative effect. In my case ferns, of all things, were the catalyst. They changed both my professional path and the choice of where I would choose to sink down roots so to speak and spend the rest of my life. Ferns fascinated me from an early age, meaning both from my childhood years and from their great antiquity in geologic time. Books on prehistoric life inevitably portrayed early reptiles, giant amphibians, and drone-size dragonflies cavorting in lush ferns. If that alone wasn't enough to evoke a lost world, a friend who worked for the Field Museum in Chicago would frequently take my family on fossil-collecting expeditions. There we would find exquisitely-preserved ferns from the Coal Age, which ranged in complexity from single pinnules to entire fronds.

Often my family took an annual vacation in either Colorado or Florida, where I immersed myself in the exotic (to me) natural world. Thus when suddenly one year my parents decided to instead vacation in northern Wisconsin, I subjected them to a long, whining complaint. I assumed, incorrectly as it turned out, that it would be a monotonous wasteland of dense pine forest with little to intrigue a budding young naturalist. Little did I realize that at the first resort we stayed at, I would immediately fall in love with the region. Both the land and the waters teemed with an incredible diversity of life forms, many of which I had only read about. Within the next few years my family purchased some property and eventually a larger adjoining piece which we made our permanent abode. What mesmerized me the most about this northwoods property were the streams and swamps with their lush stands of ferns and lycophytes…my lost world come to life!

Situated in the midst of a kettle moraine, the rugged topography and soils vary tremendously, often within only a short distance. Also, being located within an ecotone, where the boreal forest from the north mingles with the eastern deciduous forest contributes in no small way to the remarkable biodiversity. Looking at trees for instance, there are 31 wild native species found growing on this 65 acre property. No wonder then that 24 wild native fern species occur here (31 if you include horsetails). Horticulturally, the availability of various microsites for planting, access to spore exchanges, and taking the time to go on collecting trips has allowed me to introduce and test many other additional species of ferns (see article in the Spring 2018 issue).

So then which fern species favor which locations? Well, let's start with the least hospitable environments, the dry sandy woods on narrow ridges or having a southerly aspect. Altho great for lowbush blueberries, these sites are too dry for most ferns to get

established. The one exception in our region is the bracken (*Pteridium aquilinum*), a robust triangular-bladed fern with Napoleonic tendencies. Single individuals (genets) of this rhizomatous ruffian cover huge areas of forest, some perhaps having sprouted at an animal burrow over a millennium ago. This makes these our largest ferns by far in both area and volume. Bracken rhizomes can go 10 feet (3 m) underground, making the plant catastrophe-proof. The stiff umbrella-like fronds help protect the soil and smaller more delicate plants from storms. Local Ojibwe Indian people and others harvest the fiddleheads in spring. I can attest that the soup is tasty, having a natural salt and pepper flavor. However, and this is a *big* however, the plant contains several different toxins and is quite dangerous to eat. People first became aware of the extent of its toxicity when pathologists found a correlation between long-term consumption of the crosiers and stomach cancer in Japan, where it also grows. If grazed by cattle or goats, the carcinogen passes into the milk. In some parts of the world bracken is utilized as a packing material for fruits, vegetables, and even fish because of its reputation at inhibiting rot and mildew. The Scots formerly burned the green foliage to produce a ersatz soap from the ashes.

It is in relatively dry sheltered woods with more organic matter in the soil that our tallest fern can be found. This is the interrupted fern (*Osmunda claytoniana*), (photo right) a lush shoulder-high beauty creating a scene reminiscent of the Coal Age. With good reason, as identical fossils have been found in Antarctica, dating from the Triassic over 200 million years ago. At the time Antarctica was part of the supercontinent Pangaea. Thus interrupted fern is a real survivor, as unimaginably ancient as the ginkgo tree.

Even more ancient are the grape ferns (*Botrychium* spp.). (photo below) They may even be remnants of primitive progymnosperm stock, as evidenced by their pitted tracheids, secondary xylem, and vascular cambium-like tissue. Over the years I have discovered five species growing on the property. They range in size from the extremely inconspicuous dwarf grape fern (*B. simplex*) to the rattlesnake fern (*B. virginianum*). The latter has vanished in recent years, as have several other plant species, due to the ravenous eating habits of a bloated deer population, to which it is especially sensitive. However, this genus is notorious for disappearing from a location and reappearing several decades later, so one can only hope. Generally these ferns do not appear fussy in regards to soil moisture conditions; some even thrive in a dry sandy lawn.