

# Bracken Fern

*Pteridium aquilinum*



The Bracken Fern is one of seven kinds of ferns that have been identified at the Kuse Nature Preserve. It usually appears in May near Bench Q. During the winter, the rhizome and attached roots have survived deep in the ground under the ice and snow. Then, as the weather gets warm, a long stalk pushes up through the ground. A small, curved silvery fiddlehead with three major parts shaped something like an eagle's claw begins to unfold at the end of the stalk. The word "aquilia" means eagle and appears as part of the plant's name.

The fiddlehead or crozier eventually opens up into a three-part triangular blade that is about the same length as the stalk. That blade is divided into leaflets called pinnae and subleaflets or pinnules. The words pinna and pinnule are words scientists use to describe fern fronds. The word pinna means feather, so pinnate means feathered. If a fern leaf is once pinnate, the divisions along the side of the stalk are like a feather. If it is twice pinnate, that would mean that each feather has little feathers along the sides.

Bracken ferns grow in large colonies and sometimes shade and crowd out other plants. Scientists have learned that water-soluble toxins from the fern litter of Bracken Fern may inhibit the germination of seeds and the growth of certain other plants. They are common along roadsides, clearings, pastures and waste places, but not as often in the shady places where other ferns thrive. Bracken Ferns are able to adapt to many kinds of soils and soil changes. Because their underground rhizomes can survive forest fires, they are able to come back after burning and then take over areas where the fires have occurred.

Different varieties of Bracken Ferns grow in many places in the world. In Europe, their dried fronds were used for cattle bedding and even for thatching roofs and many stories and superstitions about brake or bracken were shared. While it is a very common fern in Wisconsin, only one variety, *latiusculum*, is found here.

Bracken ferns reproduce from spores that form in narrow lines on the lower margins of leaflets on mature fronds or from the spreading, underground rhizomes.

### **Bracken Ferns at Bench Q**

A colony of Bracken Ferns grows along the fence line and under the Basswood Tree near Bench Q.

If Q stands for Question, then possibly no other plant on the property can have more questions or controversy raised about it than this fern.

Following are direct excerpts from books and Internet sources that refer to it. After reading them, what questions do you have? Would you believe that it is edible or harmful? What other uses can be found in the literature?

- “-bracken tastes wonderful, like asparagus, almonds and Tuscan black kale all rolled into one,”  
The Bracken Fern-a Natural Born Killer?
- “Bracken is popular in Japan As of 1986 the city of Tokyo alone was consuming over 300,000 kg of bracken fiddleheads per year.—In China and Japan bracken fiddleheads are canned and eaten in soups as sawarbi, and they are also popular in Korea. They have also been used to brew beer in Scandinavia.”  
<http://pages.uoregon.edu/ecostudy/elp/ntfp/Fiddheads%20Final.htm>
- “\*-Bracken produces a pharmaopeia of toxic compounds including thiaminase (which breaks down the amino acid thiamine and results in vitamin B deficiency), ecdtsines (hormones that stimulate uncontrolled early mating in insects), tannins (which bind to proteins and other compounds) and hydrogen cyanide and also produces carcinogenic compounds. The combination of chemicals renders the plants toxic to most animals, both invertebrates and vertebrates, although some insect specialists ingest bracken tissue to become poisonous to their predators. Humans have long eaten the fiddleheads (emerging young leaves) of bracken but over ingestion of fresh or dried fronds has been linked to stomach and esophageal cancers.”  
Descriptions and articles about the Bracken (*Pteridium aquilinum*) –Encyclopedia of Life Brief Summary
- “ The reason we know that bracken can cause cancer is not only because of all sorts of livestock studies—cows sometimes eat the fully grown fronds and get urinary tract cancers—but also because bracken is widely eaten in Korea, Japan and parts of China.----Most of the research has been done by Japanese and Koreans searching for clues as to why they seem to have high rates of throat and stomach cancer. Apparently there are a kaleidoscope of reasons, and habitual bracken-eating is among them. Like anything plalquiloside’s poison is in the dose.”  
The Bracken Fern: A natural Born Killer? Hank Shaw- The Atlantic
- “It is not just human bracken eaters that are at risk: in 1996, researchers reported that ptaquiloside can be passed into milk from cows fed on bracken.”  
Bradley, David, Ptaquiloside- the Poison in Bracken <http://www.chm.bris.ac.uk/motm/ptq/ptqj.htm>
- “Bracken fern (fiddleheads)  
They tend to grow where there is white birch, aspen, or scrub oak and sometimes on maple soils. Often they are one of the dominant ground cover plants in young woods, and they may invade pastures and meadows in abundance. And now, a footnote of caution: The older fronds in particular are said to be carcinogenic. I believe they poison cows.  
Jack Hausotter, a wild food expert, wrote me that in 1805-06, the historic Lewis and Clark expedition reported that Indians dug the roots of the bracken fern, and roasted them for food; and in 1976

one of his students, a woman from Korea, had makeshift tables across one side of her yard. There must have been nearly 200 square feet of surface covered with the shoots of bracken fern. She told him that in Korea, bracken fern shoots were selling for a dollar a pound.

I have not tried drying bracken. I pick fiddleheads when the fronds are still unfurled and don't eat them very often." (Hammerstrom, p. 5)

••• "Bracken ferns spread so quickly because they are poisonous to other plants. Scientists in Taiwan researched the Bracken fern's interactions with other plants. They found that the Bracken fern altered the cell cycles in plants and altered mitosis. This explains why the Bracken fern is dominant over other plants. This adaptation has led to pastures full of Bracken fern around the world."

<https://bloweb.uwlax.edu/bio203/s2013/schaefer-rach/adaptation.htm>

••• "Bracken fern poisoning affects the cow and horse differently with regard to both clinical signs of illness and tissue damage. In Cattle: After feeding on bracken fern for several to many days, cattle often sicken rather suddenly and contrary to their reaction to most types of plant poisoning, they may show a very high fever. Major effects of bracken fern poisoning in cattle are related to damage to the blood forming elements (decreases production of white blood cells, red blood cells, and platelets) and sometimes to urinary tract carcinogenesis. Clinical signs may include rapid loss of body weight, difficult breathing excessive salivation bleeding from the nose blood in the droppings and congested hemorrhagic or icteric (jaundiced or yellowish) mucous membranes may be observed. Bracken fern poisoning has been mistaken for anthrax or other infectious diseases of cattle.

In horses:: The first clinical signs of bracken fern poisoning in horses are usually an unsteady gait, a "tucked up" appearance of the flanks, nervousness, timidity congestion of the visible mucous membranes, and constipation. Later the horse may stand with legs spread,, waling with a staggering gait, and occasionally fall especially if its head is raised suddenly. The appetite may remain normal. Dilated pupils and both increased and decreased heart action have been reported in cases of equine bracken fern poisoning. If not treated, death occurs in 2-10 days, though some horses occasionally survive up to 30 days or more after onset of poisoning."

Bracken Fern | Plants toxic to animals | Veterinary Medicine library at U of Illinois

••• "There is a great deal of debate about the edibility of bracken fern. On one hand, there is an enormous body of ethnographic evidence that it is edible. It is regularly eaten by hundreds of millions of people today, and in North America was a traditional food for many Native American cultures. ---- Despite this, a search on the Internet will turn up hundreds of sources telling you that this plant is poisonous, even deadly, and should never be eaten. This is due to the presence of a very potent carcinogen called ptaquiloside. However, ptaquiloside is not heat-stable and is apparently destroyed by cooking.----While it is advisable to eat all fiddleheads cooked, bracken fern fiddleheads should definitely be cooked to destroy the ptaquiloside."

<http://foragersharvest.com/fern-fiddleheads-the-succulent-stalks-of-spring/>

Of course, we know that many garden food plants also have poisonous parts. We eat potato tubers but know that the leaves contain poisons. We use rhubarb stalks, but avoid the toxic leaves. We enjoy black elderberry fruit and use the blossoms for medicinal teas, but recognize that the rest of the plant contains poisons. Even apple seeds eaten in large quantities are toxic. In the case of ferns, the mature fronds of any fern should definitely not be eaten. It is likely that some of the references listed that referred to livestock poisoning described animals that ate mature fronds in times of scarcity of other available fodder, BUT-- Bracken Fern is certainly a plant that warrants careful research and clearly demonstrates that not all printed or digital sources are equally reliable.

## **BRACKEN FERN ACTIVITIES THINGS TO DO AT BENCH Q**

Please examine the ferns only by using hand lenses, magnifiers, cameras or by making drawings or sketches. Leave the growing plants for other trail users to examine and enjoy.

### **In Early Spring**

- Look for dead fronds from last year.
- Look for fiddleheads or crosiers. Describe their shape, color, wooly hair, and stalks. Compare what you see with pictures in a book or on the Internet. Can you see the three parts that some people compare to an eagle's claw?
- Compare the fiddleheads with those of other ferns on the trail.
- Examine crosiers that are in different stages of unfolding. Count the turns in the coils. Notice how each pinnae and pinnule is folded and unfolds.
- Look to see how many other different kinds of plants are growing in the patch of ferns. Is there evidence that the Bracken Fern dominates or takes over other plants in the area?

### **In Early Summer**

- Note how have the fiddleheads changed to fern fronds.
- Look closely at one Bracken Fern frond. It will have a stalk or stipe and three leaflets or pinnae. Each of the three leaflets will be divided into smaller leaflets or pinnules. The two lower leaflets will be larger or more spreading. Can you find more divisions?

### **In Late Summer**

- Lift the margins of a fruiting pinnule. See what is folded under it. Look for brown spore cases pushing out from under the folded margins. A magnifying glass may help.
- After you have looked at the fiddleheads and the spore cases or sporangia on real ferns along the trail or at your home, you may want to go to the Internet to locate close-up video photography of fern spores being catapulted from their spore cases or slow motion photography of fiddleheads opening.

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