

Lichens in the Preserve: a virtual tour on Picnic Point, UW-Madison Lakeshore Nature Preserve

April 2021

Susan Will-Wolf, swwolf@wisc.edu

**Department of Botany emerita, UW-Madison,
member, Friends of the Lakeshore Nature Preserve**

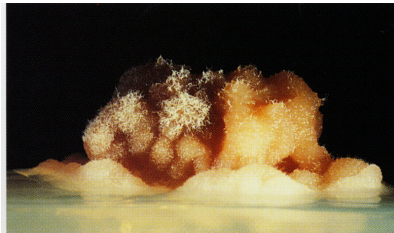
**Photos by Marie Trest, Andrew Khitsun, John Wolf,
me, and others**

Overview

- A brief introduction: lichen biology and ecology
- The virtual tour of the Lakeshore Nature Preserve
- Some lichens you might find elsewhere in the Preserve
- Additional resources

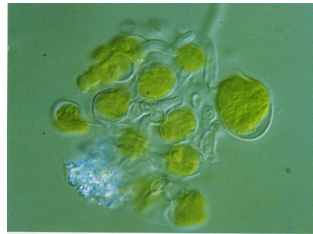
Lichen Biology and Ecology

- **The classic lichen symbiosis:**



fungus

+



algae

=



lichen

This set of images is from the book "Lichens" by William Purvis, 2000

From recent studies – many lichens might need bacteria also, to produce all their identifying characteristics.

Most people are familiar with mushrooms and shelf fungi; they are in the "basidiomycete" group of fungi.

MOST LICHENS are in the "ascomycete" group of fungi; often not conspicuous and this group also includes a lot of plant disease fungi.

- Lichens grow where plants don't. They are often quite small!
- Lichens grow on 3 important surfaces = substrate:
 - on bark or wood, on rock, and on soil (especially in dry places)
 - Many lichen species grow on only one of these surfaces
- Lichens have 3 major growth forms – the individual body = thallus is:
 - foliose = leafy, flat; with an obvious top and bottom side.
 - fruticose = tufted or stringy, and
 - crustose = at least the bottom layer embedded in the surface
 - Examples of each are on the next 3 pages

**Common
greenshield**
(*Flavoparmelia
caperata*)

**Foliose =
Leafy, flat**

(has an underside you can tell
is not embedded in the
surface)

You may well see these species
in the Preserve, though they
might not be as large or
obvious.

Common name (with scientific
name in parentheses)

**Mealy rosette
lichen**
(*Physcia millegrana*)



Photo by Andrew Khitsun



Photo by Troy McMullin

Poplar sunburst lichen
(*Xanthomendoza
hasseana*)

The round orange cups are
fruit bodies; these most
common lichen fruit
bodies are called
apothecia



Photo by Marie Trest

**Fruticose =
3-D stalked, tufted, or stringy**

Boreal oakmoss lichen
(*Evernia mesomorpha*)



Sinewed Ramalina
(*Ramalina americana*)

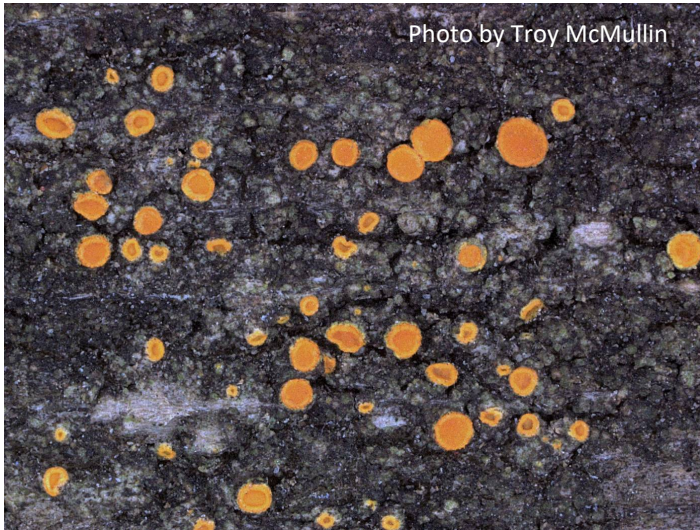


Mealy pixie-cup
(*Cladonia
chlorophaea*)

This is an example of a 3-D stalked lichen; the only kind of fruticose lichen you are likely to see in the Preserve

Crustose = embedded in substrate

You will see **Firedot lichens** on the tour; you will probably see **Common script lichen** elsewhere in the Preserve; you might also see a **Boulder lichen** on rocks in the open elsewhere.



Firedot lichen

(*Caloplaca* species)

Left: most have orange or red fruit bodies, usually on gray or yellow crust. Different species are found on bark and rock

Common script lichen

(*Graphis scripta*)

Below: you might see this species on shaded tree trunks in the Preserve.



Boulder lichen

(*Porpidia* species)

on rocks, even on concrete



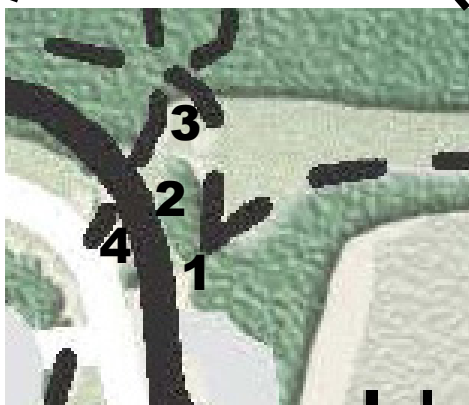
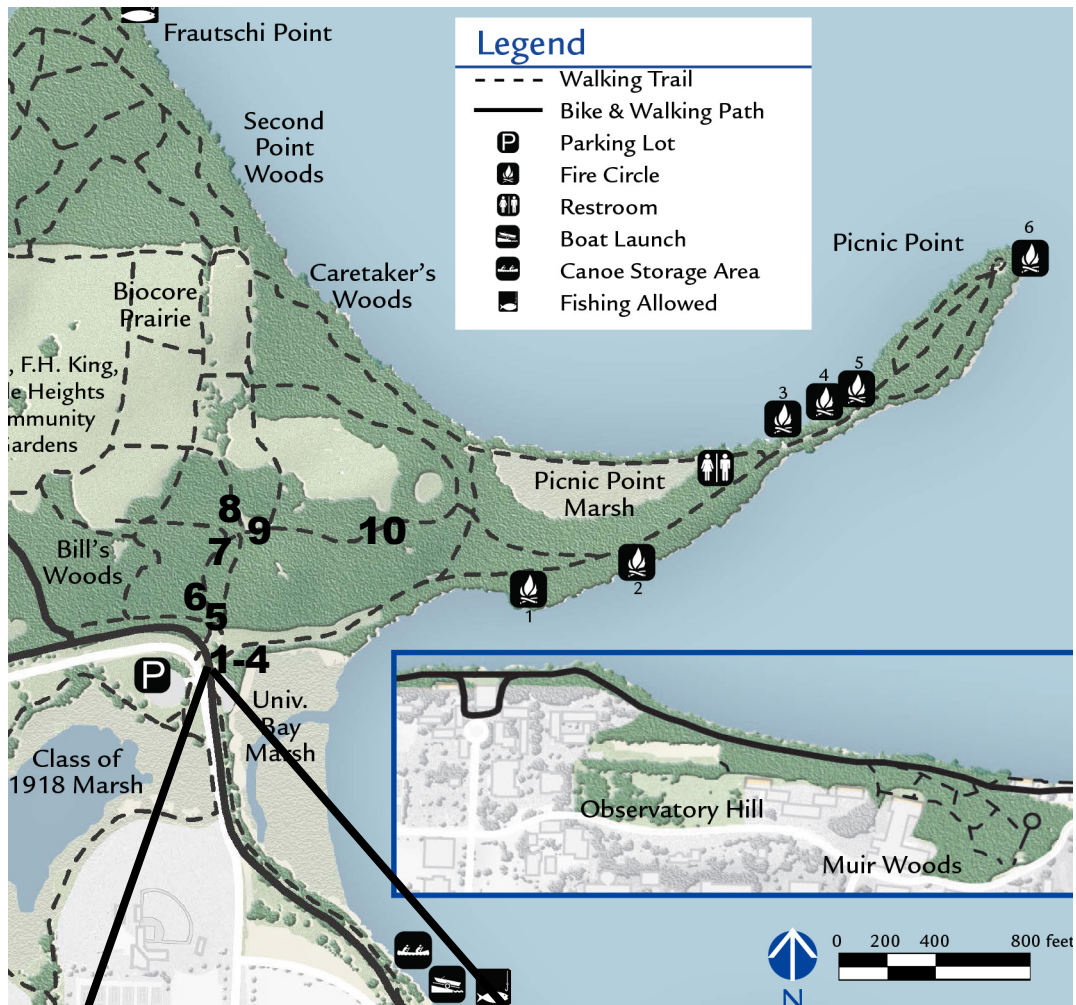
Photo by John Wolf

The virtual tour of lichens in the Preserve

- This tour starts at the Picnic Point pedestrian entrance. First you will check out the entrance wall area between here and the road entrance, then you will proceed along the main paved road.
- **TAKE NOTE:** The Rock Wall is a geological and historical treasure. Please preserve its integrity and don't climb on it! While many stones are hard, the sedimentary rocks are easily weathered by feet scrambling up the wall. In addition, the lichens on its rocks are generally slow growing and would need many years to recover from climbing damage.
- Please stay on or very close to the path or road, once you are beyond the entrance wall.
- Selected stops are marked on the map on the next page. At most of these stops, branches or logs have been moved close to the road for you to examine the lichens pictured here. Please return them where they were when you are done looking.
- Bring a hand lens or portable magnifier if you have one.
- Many lichens can be identified to group or genus just by looking; only a few can be identified to species this way. Tour notes reflect this.
- April is a great month to observe woods structure. While you are walking between stops and looking for lichens, take the time to look around through the woods. Note the scattered large oaks with their spreading large branches and knobs on trunks where old branches were. This is a sure sign they started life in the open. The smaller straight-trunked trees grew later and made this a closed forest.
- Note the shelf fungi growing on tree trunks, snags, and downed logs.
- Note the many shades of green of the mosses growing on tree trunks and bases, and on the downed logs. Many of them have fruiting "sporophytes" rising above the green. Once the leafy plants have grown up, these will be mostly hidden from view.
- Please don't collect or remove any lichens from anywhere during your walk!!
- The lichens pointed out on the tour are only a small selection of those that grow in the Preserve. After the tour pages, there are a few pages showing lichens you might see along smaller paths elsewhere in the Preserve. Happy Hunting!
- The last page of this file has some references if your interest has been piqued to explore lichens further.

Preserve trail map with lichen tour stops

The map locations of stops are approximate – pages below include detailed descriptions of each stop location



Stops 1 – 4 are better illustrated in this expansion of the Picnic Point entrance area.

Stop 1 - The pedestrian entrance to Picnic Point.

1A Face the maze gate from outside. On the corner of the rock wall to your left, the bright yellow on several of the rocks is a lichen! This wall is quite old; it probably took many years for this lichen to spread this far.

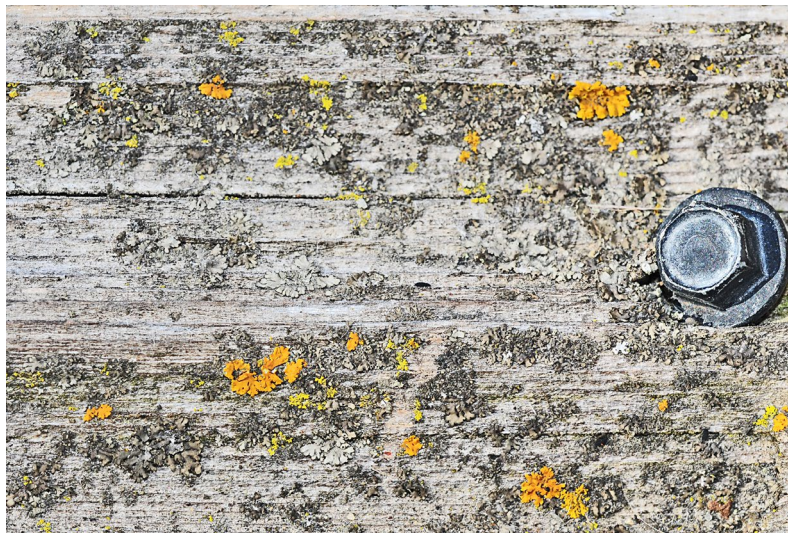


Common goldspeck lichen – a crust lichen, (probably *Candelariella vitellina*)

The strong yellow patch in the image is about 3 inches wide.

Both photos by John Wolf

1B Go through the maze gate, walk left to its outside corner. Look closely at the upper surface of the middle horizontal log near the corner post, and the corresponding log just around the corner. Count how many tiny LEAFY LICHEN species there appear to be. This gate was completely rebuilt just a few years ago; these are relatively fast-growing lichens!



Sunburst lichens (1/2 inch wide) are strong orange; tiny **Lemon lichens** (*Candelaria* species) are pale yellow. A **Rosette** lichen just left of lower center is bone gray/white. The many tiny **Shadow lichens** (*Phaeophyscia* sp.) are brownish gray with black edges.

Stop 2 - The inside of the rock wall – remember, don't climb!

Walk left/N along the path that parallels the rock wall, about 1/2 the way to the paved road. Just before the first evergreen tree, walk to the wall and find a red rock at about chest- to head-high. On the red rock and several to either side of it, look for small gray-white leafy lichens.



Photo by John Wolf

The image at right, about 4 inches across on the above-mentioned red rock, shows distinct grayish lobes with small white granules. The long white patches are places where the top layer was eroded or eaten off by slugs or insects.



The 6-inch-wide image at left is probably a leafy **Powder-tipped shadow lichen** (*Phaeophyscia adiastrata*), with pale to brownish gray upper side, loosely arranged lobes, and powdery granules along lobe edges. Its dark underside is not seen here. A few white-rimmed fruit bodies are at top center. It grows on both rocks and trees.

Stop 3 - The isolated boulder, page 1

Go back to the path and walk on to the isolated boulder that is nearer the paved road. This boulder is a **lichen treasure-trove**; it may have as many as 20 different species on it!



Spend as much time as you can stand looking for different kinds, but please don't climb on it! Most lichens are patches no more than 1 inch across. Most are embedded crustose lichens, and most have tiny fruit bodies showing. Look at this mini habitat of many lichens competing for space and position, and feel mighty! This and the next two pages have close-up pictures, with notes about what kind of lichen they might be.

Photo by John Wolf



This closeup shows mostly embedded/crustose lichens. The largest strong white **Sunken disk lichen** (*Aspicilia* sp.) is about ½ inch wide; note smaller ones scattered around. Just to the upper right, right, and lower right of this white lichen are grayish white lichens covered with white rings (fruit bodies) having brownish centers; these are **Rim lichens** (*Lecanora* sp.). Next to them at far upper right, a tan lichen with black dots (also fruit bodies) might be a **Button lichen** (*Buellia* sp. or close relative). The clusters of small bright orange circles are fruit bodies of **Firedot lichens** with most of their thallus embedded right in the rock.

Stop 3 - The isolated boulder, page 2

Photo by John Wolf



In this closeup of the side nearest the wall are several tiny leafy (foliose) lichens. The bright yellow/orange **Sunburst lichen** (*Xanthomendoza* sp.) at upper right is about $\frac{3}{4}$ inch wide; several more are lower. There were also a couple of small individuals of this type in the closeup on **Stop 3...**, **page 1**. Several smaller and paler yellow to greenish **Lemon lichens** (probably *Candelaria concolor*, though that species is mostly on bark) are at upper right, as well as elsewhere. Small bone white **Powder-tipped rosette lichens** (*Physcia dubia*) are at upper right and left center (NOT the same species you saw at **Stop 2**). The brownish gray leafy lichen at left center is one of the **Shadow lichens** (*Phaeophyscia* sp.); several smaller ones are scattered around. The very dark gray tiny lobes in the crack just left of center might be the **Dark shadow lichen** (*Phaeophyscia sciastra*), one of the smallest of this group. If you have really good eyesight or zoom in on the image, you can see very small yellow circles with orange centers – fruit bodies of crustose **Goldspeck** or possibly **Firedot lichens**. And there are probably 2 or 3 more species just in this image.

Stop 3 - The isolated boulder, page 3

Photo by John Wolf



This closeup shows only embedded/crustose lichens. The bright yellow patches of a **Goldspeck lichen** are each about $\frac{3}{4}$ inch across. This might be the same species as you saw in Stop 1, but with less thallus and more fruit bodies. Below the left **Goldspeck lichen** is one species of **Rim lichen**; its fruit bodies have somewhat ragged pale edges and gray to dark centers. This is probably the same species as in the closeup on **Stop 3..., page 1**. To its right is another **Rim lichen** that has fruit bodies with less ragged edges and pale centers. It might be the same or a different species; one would need to check with a microscope to know. Orange fruit bodies of **Firedot lichens** are scattered around the image.

Stop 4 - On the outside of the wall near the paved road entrance – again, don't climb!

Go out the driving road entrance, then go left/S about 15 ft and look for big patches of gray-white on dark rocks.



These whitish patches are probably a **Sunken disk lichen** (*Aspicilia* sp.), but possibly not the same species as the patches found on the isolated boulder and shown in the closeup on **Stop 3..., page 2.**

The image is about 8 inches wide.

Photo by John Wolf

This closeup (different camera) shows the sunken fruit body disks. Image is about 2 inches wide.



Check out fallen branches all along the rest of your walk. Please replace them off the road when done.

Sometimes all 3 of these lichen species are found on the same branch high in a tree. They like light; **Mealy rosette** and **Lemon lichen** can stand more shade and **Hoary rosette** has a shade-loving lookalike. Check out your street trees at home!

Mealy rosette lichen (*Physcia millegrana*) sometimes has fruit bodies. It ranges from this grayish in shade to bright bone white in sun.

Image is about 1-inch wide

Hoary rosette lichen

(*Physcia aipolia*) ranges from bone gray/white to bright bone white in full sun.

On a 1/3-inch-wide branch



Photo by Andrew Khitsun

Candleflame or Lemon lichen (*Candelaria concolor*) is pale to bright lemon yellow

On a 1/2-inch-wide branch



Stop 5, page 1 - hackberry tree

Come back through the road gate; walk about 20 ft NE past the trail crossing up the paved road to the first large tree near the road on the right – a hackberry with its characteristic warty ridged bark. Approach the tree - from about 6 ft away you can see the strong yellow patches at about eye level. This is the leafy **Candleflame** or **Lemon lichen**. It is very common on many deciduous tree trunks including street trees, but this is a particularly spectacular display.



The trunk showing in the photo on the left is about 8 inches across.

The closeup below is about 1.5 inches across. Note the many tiny branched lobes on this lichen. There are lots of small grainy specks all along the lobes, and no fruit bodies showing.



Both photos by John Wolf

Stop 5, page 2 - log on the ground just past the hackberry tree

Walk past the hackberry tree and look to your right on the ground.



This 4-to 5-inch-wide mossy log, moved from near others in the background, is colonized by **Bottlebrush frost lichens** (*Physconia detersa* or a very close relative). This lichen likes shade; it is usually found on tree trunks and old logs.

The closeup below, about 3 inches across, shows the pale powdery (hence “frost”) coating on the tips of brownish lobes. “Bottlebrush” refers to the shape of root-like fibers on the underside.



Photo by John Wolf

Stop 6 - the downed oak top

Walk another 20 ft along the paved road and look to your left. You will see the downed top of an oak. Walk up until you are adjacent to the top and look for the stack of branches near the pavement. These have some typical treetop branch lichens.



The ½-inch-wide branch at left shows pale gray **Hoary rosette lichens** that grew in full sun, with a small yellow **Candleflame lichen** in between.

The ½-inch-wide branch below shows a small **Hooded sunburst lichen** (*Xanthomendoza fallax*) growing with a **Hoary rosette lichen**. One of its “hoods” can be seen at lower right just above the bottom lobe, with paler yellow powdery specks inside.



Photo by John Wolf

Stop 7 - mossy base of oak on left

Continue walking up the paved road; as the road turns a bit look for a large oak tree on the left that has a mossy base. About 30 feet farther on beyond the oak a signposted paved side road forks left to “Picnic Point Storage.”

Photo by John Wolf



In the above photo, small individuals of the brownish to grayish **Powder-tipped shadow lichen** (remember Stop 2) are nestled among the mosses or growing directly on bark at the base of the tree. This lichen loves shade.

The photo at right from Ohio shows how it looks when very healthy.



Photo by Andrew Khitsun

Stop 8 - side trip on the road to Biocore prairie

Walk past the first paved side road to a second signposted (for Biocore prairie) paved side road to the left. Take 20 steps along this side road to see a large oak spreading its branches ahead to your left. Look for a couple of very large branches on the ground just left of the paving. The lichens here are starting to die back without the full light they had before the branches fell.



Rough speckled shield lichen (*Punctelia rudecta*) in the left photo entirely circles the 4-inch-wide snag rising from the larger branch.

The 1.5-inch-wide closeup at right shows characteristic white dots on the lobe surfaces.



The gray center area of an individual, seen in all but the closeup, has hundreds of tiny branched finger-like stalks (isidia) rising from the surface.

This species is very common on forest trees.

This 10-inch-wide picture from central Wisconsin shows a single large healthy individual



All photos by John Wolf

Stop 9 - lichens on a pine branch.

Go back to the main paved road and turn left/E; continue on about 20 steps until you see a fresh pine branch just off the pavement to the left.



Photo by John Wolf

Look for this 2-inch-wide very pale green juvenile **Common greenshield** lichen that shares its pine branch with a small yellow **Candleflame** lichen just below it, and several gray **Powdery rosette lichens** (*Physcia americana*). **Common greenshield** is common on many forest tree species; **Powdery rosette lichens** are more commonly found on deciduous trees.

Below: these 4- and 5-inch wide **Common greenshield** individuals from central Wisconsin show adult features: Pale green without white dots, powdery granules toward the center. The dark underside is not shown.



Photo by Andrew Khitsun

Sometimes **Common greenshield** gets very large...in Maryland

Photo by Marie Trest



Stop 10 - THE LAST OFFICIAL STOP - more lichens on pine branches

Keep walking east on the main road past one set of low concrete “bridge” edges to a second set. Examine the many pine branches right next to both sides of the road.



Left picture: overturned lobes at upper right of this 1.5-inch-wide juvenile **Rough speckled shield lichen** (Recall **Stop 8**) show the characteristic pale lower surface.

Bottom picture: this 1-inch-wide pine branch has larger gray **Powdery rosette lichens** mixed with smaller greenish yellow **Candleflame lichens**. Possibly city dust on acid pine bark supports these lichens more often found on deciduous trees.

Both photos by John Wolf



This brief tour includes only a few lichens. Here are a few more you might see on other Preserve forest paths (A):

These are found mostly on trunks of deciduous trees



Photo by Andrew Khitsun

Small brownish gray **Orange-colored shadow lichen** (*Phaeophyscia rubropulchra*) has granules on edges; the closeup below shows the characteristic orange middle layer.



Photo by Lynda Miller

Medium size gray **Powdery axil-bristle lichen** (*Myelochroa aurulenta*) has granules on upper surfaces and U-shaped sinuses between lobes.



Photo by Stephen Sharnoff

Small brownish gray **Pompon shadow lichen** (*Phaeophyscia pusilloides*) has granules in pale green upturned globes.



Photo by Andrew Khitsun

You might see elsewhere in the Preserve (B):

These 3-D stalked *Cladonia* lichens are most likely to be found with mosses on tree bases, on old fallen logs, and maybe on rocks. All have crowded small lichen thallus lobes at the base of the stalks.



Photo by Andrew Khitsun

British soldier
(*Cladonia cristatella*)
stalks (left) are usually
 $\frac{1}{2}$ to 1.5 inches tall
but can be taller. The
red caps are fruit
bodies.

Common powderhorn
(*Cladonia coniocraea*)
stalks (below) are
usually $\frac{1}{2}$ to 1.5 inches
tall but can be taller

Mealy pixie-cup stalks are usually
 $\frac{1}{3}$ to $\frac{1}{2}$ inch tall.



Photo by Marie Trest



Photo by Stephen Sharnoff

You might see elsewhere in the Preserve (C):

These “dust” lichens all have a surface of powdery granules. Several species groups unrelated to each other have similar appearance, and some also have other structures.



The **Fluffy dust lichen** (*Lepraria finkii*) has **ONLY** powdery granules, no other structures. It is found on tree bases, shaded rocks, and over mosses. This picture is about 5 inches wide.

Both photos by Andrew Khitsun



The **Mapledust lichen** (*Lecanora thysanophora*) has this characteristic white fibrous edge when it is at its best (~2 inches wide here), but often has only the interior powdery granules showing. It is found on shaded tree trunks. Note it is in the same group/genus as the **Rim lichens**.

Resources for learning about lichens

- The book [Learning about Lichens](#), reviewed on the linked web site, focuses on lichens of northeastern North America.
- [LichenLand](#) provides several fun online ways for beginners to learn about lichens; it features lichens of the Pacific Northwest.
- The web site [Lichens of North America Information](#) introduces the book of the same name, with keys by Irwin Brodo and stunningly beautiful pictures of lichens taken by Steve and the late Sylvia Sharnoff. The lichen common names were taken from this book. The site also has other lichen resources.
- The United States Forest Service has a great website about [lichens](#), covering the entire country. It includes several subsites about lichens, lichen identification, and a lichens photo gallery.
- All of the sites linked above include links to other lichen resources.
- The Wisconsin State Herbarium (WIS) has a huge collection of [lichens](#); most of its Wisconsin specimens are databased through the Consortium of North American Lichen Herbaria (CNALH) portal. This link gives local notes and easy access to CNALH with lots of pictures and information. Enter a species name, and choose Wisconsin to search. WIS also has other information about local lichens.
- The [North American lichen checklist](#) web site has the full scientific names of all the lichens recorded for North America, if you are interested.

Friends of Lakeshore Nature Preserve members MJ and Thomas Morgan are working on a project to identify all the lichens found in the Preserve. Contact Friends board members Tom Bryan tbryan@wisc.edu and Doris Dubielzig dubielzig@sbcglobal.net for more information.

THANKS to Andrew Khitsun (Madison resident), Troy McMullin, Lynda Miller, William Purvis, Stephen Sharnoff, Marie Trest (UW-Madison Botany), and John Wolf (my husband) for either giving to me or making publicly available most of the lichen pictures in this tour. I took the pictures that don't have a name attached to them.