

## Reading the Natural Landscape: Exploring Loda Lake's Natural Communities

By the end of this walk visitors will

- understand the concept of natural communities
  - the variety of natural communities is what makes Loda Lake such a rich sanctuary;
  - how they are managed;
  - and how they have changed as a result of human activity – logging and invasive species
- know a little bit about the interactions of plants and animals such as pollination
- learn about a few plants and animals found at Loda Lake as they relate to natural communities
- want to return to explore how the area changes as seasons change
- know about the partnership between the Forest Service and Garden Clubs of Michigan and other community organizations.

The stops are keyed to the numbered posts used in the wildflower trail.

### **STOP            TALKING POINTS**

1 – picnic  
area

- Welcome to Loda Lake Wildflower Sanctuary.
  - Only wildflower sanctuary in the National Forest system.
  - Over 230 species of native plants have been identified at the sanctuary.
- On this walk we'll discover why this area is home to so many different kinds of wildflowers and other native plants.
- Loda Lake Wildflower Sanctuary was created as a partnership between the Forest Service and the Garden Clubs of Michigan in 1950. That partnership continues today.
- Brief introduction to natural communities
  - Natural communities are like human communities. Every human community is made up of homes and the people who occupy them, churches, schools, stores, and more.
  - Natural communities are made up of – and are defined by – the particular groups of plants and animals found in them. Plants, in turn, are dependent on particular soils, topography, geology, climate, and more. Scientists describe natural communities based on many of those same factors.
  - Just as different communities have different people, churches, schools, stores, etc., different natural communities have different, though related, types of plants and animals. For example, all forests are dominated by trees, but one type of forest is dominated by oaks and pines, while beech and maple are dominant in another type of forest.

- The many natural communities at Loda Lake are one reason there are so many different trees, shrubs, wildflowers and grasses here, and why this area is ideal for a wildflower sanctuary. The trail winds through many of these habitats, including wetlands, several types of forests, and an area being restored to a savanna.
- Trail is ½ mile long and the walk will last approximately 45 minutes. There are 13 stops, including this one.
- “rules:”
  - Stay on the trail
  - Leave the wildflowers for others to see; please don’t pick any
  - Let the guide lead

2 – Post 5

- The type of soils, the amount of water available to plants, slope (the steepness of a hill, if any), and aspect (the direction a slope faces) all help determine what plants grow in a given place. As mentioned at the first stop, these characteristics are used to define natural communities.
- This is a dry-mesic forest dominated by white oak trees. The term *mesic* applies to the amount of soil moisture available to plants. *Mesic* soils have a moderate amount of moisture, while *dry-mesic* soils are somewhat drier.
- The soils here are sandy. Sand grains act like a sieve, allowing the water to pass between them, so sandy soils don’t hold much water. As a result, the kinds of trees and other plants that grow here must be able to grow in dry areas.
- Sandy soils don’t provide a good anchor for tree roots. In high winds, trees can blow over. These are called windthrow events. The logs you see here may be the result of just such an event.
- The soils in this area are acidic; they have a low pH. Some plants do well in acidic soils. Blueberry is one of those. Blueberries are a treat to eat and animals like them as much as humans do.
- Witch hazel is also found here. It is a small tree in the understory – that is it grows under the oaks that make up the canopy or top layer of the forest. Witch hazel has been used by humans for thousands of years. The bark and leaves have astringent properties. Astringents cause tissue to contract when applied and are typically used to protect the skin and reduce bleeding from minor cuts and abrasions. The Cherokee rubbed witch hazel leaves on scratches, and made an infusion by boiling the leaves and bark. The infusion was applied externally as a

lotion for dry skin, and they also took it internally for a variety of ailments including colds and tuberculosis. Witch hazel is still an ingredient in many astringents sold commercially today.

3 – Post 12  
and 12a

- Here you can see the natural community is a little different than the stop at post 5. There is more moisture in the soil here, which supports different vegetation. There are more ferns – marsh fern, royal fern and sensitive fern – and some different trees, including hemlock.
  - When ferns come up in the spring, they unroll, forming a shape that looks like the head of a fiddle. Many people collect fiddleheads of some fern species each spring to eat. The ferns found here are not edible.”
- Just as in urban areas you can drive from one community to another and not see much change, so the changes between natural communities are often subtle, with some plants found in several of them. Hemlock, for example, is found in both mesic and dry-mesic forests.
- The natural community on the edge of the lake is very much like a bog, and a number of plants found in bogs grow here and elsewhere along the lake margin. Sphagnum mosses form peat mats in bogs; water is at or very near the surface, and the peaty mucky soils are very acidic.
- Two of the most interesting bog plants are sundew and pitcher plant. They are carnivorous! They derive nutrients by catching and digesting insects in a bizarre adaptation to their low-nutrient environment. While bogs have a lot of sunlight and water, they lack nitrogen that plants need. Most other plants absorb nitrogen from the soil; carnivorous plants get theirs from insects.
  - Sundew leaves act like sticky fly paper. Insects become trapped by the sticky hairs on the leaves. Those hairs produce digestive juices that decompose the trapped prey. The diminutive sundew doesn't look like it could eat much, but it is reported that one researcher counted insects trapped in a sampling of plants in England and estimated that about six million insects were trapped in a bog of about two acres! Of course, there were many more sundews in that bog than at Loda Lake.
  - Pitcher plants harvest their prey differently than sundews. They use an elaborate pit-trap method. Flies, attracted to the hollow leaf by color and the smell of decaying prey, find themselves on a waxy surface that leads to a pool of water. Flies have wings and should be able to fly out of the trap; however, the plant supplies a wetting agent that wets the fly's wings so it can't fly! The inside walls are so slippery, that even a fly's feet can't stick to them, and the fly slides down to the bottom of the leaf where it is digested. Pitcher plants have also been found by the boat

ramp.

- So far we've just talked about the plant life here. This is a good place to talk about some of the animals you might expect to see. Whereas with plants if you know where they grow you can pretty much count on finding them, animals don't stay in one place and it's harder to predict when and where you'll see them. Instead, look for evidence of them.
- Dead trees like the snag near the water by Post 12a offer shelter for cavity nesting birds and small mammals such as squirrels. The pileated woodpecker is one bird that might use it. Along the water watch for the great blue heron, and in the marshy areas you can often see red-winged blackbirds perched on cattails.

4 – area  
near Post  
13

- Before Europeans settled this area, the land was covered by a vast pine-oak forest. During the late 1800s, most of the trees were harvested to provide lumber for railroad ties. Like much of Michigan at that time, the area was almost completely cleared. One account describes the land as “stripped of timber...and largely strewn with decaying pine logs and stumps as large as 4 feet in diameter.” Standing in the forest today, it's difficult to imagine the area without trees.
  - Show photo of cut-over forest and/or have participants close their eyes and imagine there are no trees in the area they are standing.
- If any of those stumps remained, the tree rings would reveal a lot about the history of this area. Larger growth rings would indicate years of adequate rainfall and good growth, while small rings would indicate years of poor growth. Fire scars would tell us about the frequency of forest fires and provide clues to how severe the fires were and even the direction the fires burned. We tend to think of forest fires in negative terms; as very destructive. Natural fires were an important part of natural landscape before Europeans settled in the area. These natural communities were adapted to fire (discussed more in the savanna area).
- When the forest grew back, the pine did not replace itself the way the oak did. A few pine trees are scattered among the oaks, but many fewer than were here before logging.
  - Trailing arbutus, one of the plants here (found near Post 8), grew in the vast pine-oak forests. When found in oak forests today, it provides a clue that the forest was once an oak-pine forest.
- Trailing arbutus figures into the human history at Loda Lake. When the Hanson's owned the property that is now Loda Lake, Mr. Hanson made a special trip each year to collect large amounts of it, pack it in ice from Mr. Hunt's ice house, and take it to his friends and colleagues

in Chicago. Mr. Hanson was not alone; trailing arbutus, an evergreen, is often collected for wreaths and winter decorations. In fact, over collection is a threat to trailing arbutus in some areas, nearly eliminating the plant from Massachusetts at one time, though it is common through most of its range. In Michigan it is protected under the Christmas greens act.

- The area behind Post 13 looks very open, as if some of the forest hasn't grown back. There could be many reasons for this. One might be that the area was used by Boy Scouts for camping some years ago. That kind of use over time can compact the soil, making it more difficult for plants to become established.
- One of the management goals for the wildflower sanctuary is to restore plants to the area. Native shrubs and grasses such as bottle brush grass have been planted in the opening.
- When you walk out into this open area, you may notice a lot of acorns underfoot. Acorns are an important food source for many wildlife including white-tailed deer and wild turkey. What other wildlife eat acorns?

5 – Post 19

- When the boardwalk was built this area looked very different. At that time the boardwalk crossed what is called an emergent marsh and there were no trees and shrubs as there are today.
- The plants that grow in emergent marshes, like cattails, are rooted in the soil beneath the water, while the tops of the plants emerge above the water's surface – hence the title *emergent marsh*. These are shallow water wetlands that often occur at the shores of lakes and streams, as here at Loda Lake.
- Now this area is dominated by small trees and shrubs and has become a different kind of natural community called a shrub thicket. Shrub thickets are like marshes dominated by shrubs. They are often found near streams, and sometimes near lakes. The soils are muck or peat and acidic. The common dominant shrub is tag alder. On drier hummocks you can find swamp rose, cinnamon fern, and royal fern.
- Because the soils in the shrub thicket are acidic, you can also find some of the same plants here you might find in a bog. Cranberries grow here (south side of boardwalk east side of bench) and pitcher plant has also been found in the area of the boardwalk.
- Poison sumac also grows near the boardwalk. Poison sumac is related to poison ivy and poison oak, and like them, causes an itchy rash in many people who come in contact with the plant. The rash is caused by

exposure to an oil called urushiol, which is found in all parts of the plant. The rash is contracted only by direct contact with the oil. That doesn't necessarily mean direct contact with the plant; you can pick up the oil from clothing, gardening implements or pets that have been in contact with the plant. Not everyone reacts to urushiol, though anyone can develop sensitivity at any time, so it's best to avoid the plant. If you are exposed to poison sumac or its relatives, you may be able to limit or prevent a reaction by washing with soap and water within 30 minutes of exposure. It is unusual to find this species this far north in Michigan.

- 6 – Post 21
- Many actions impact natural communities and the plants and animals found in them. Some, such as drought, are natural. Humans precipitate other impacts through timber harvest and development. One of the biggest threats to natural communities throughout the U.S. comes from other plants and animals: those that have been introduced from other parts of the world.
  - Invasive species are those that are not native to a given ecosystem and whose introduction will cause harm to humans and natural communities. They can be plants, animals, and other organisms such as microbes.
  - Why are we concerned about invasive species? Most ecologists agree that overall, invasive exotic species of plants and animals have reduced the biodiversity of most ecosystems in the U.S. Invasive exotic plants usually crowd out the native plants in a given area. Instead of having many species of plants that provide food and cover to pollinators and other wildlife, an area is left with only one species, and that one species usually has little value to wildlife.
  - At Loda Lake the Forest Service is controlling a number of invasive species. Purple loosestrife has become established along the lake edge here, though control efforts have reduced the amount of it here. Purple loosestrife came to the U.S., probably in ships' ballast, in the late 1800's. It commonly infests freshwater wetlands. This plant is particularly destructive because it replaces the native vegetation that wildlife rely on for food and cover. Once it gets established, this plant is very difficult to control because it multiplies rapidly: each plant produces over 2 million seeds in a year!
  - Spotted knapweed is another invasive species the Forest Service is controlling here. It was accidentally introduced into the U.S. in the late 1800's, probably through ballast in ships or in shipments of other seed. As with purple loosestrife, spotted knapweed crowds out native plants. Some plants such as this one are particularly troublesome because the

plant produces a chemical in its roots that makes it difficult for other plant species to continue to grow nearby. This type of chemical production to benefit the producer plant over other plants is called allelopathy. Some native plants such as black walnut are also allelopathic.

- Autumn olive has become established in the area of the orchard around Post 31. The large shrub produces seeds that birds eat and then scatter across the landscape. It was introduced to the U.S. in 1830 as an ornamental shrub, to provide food and cover for wildlife, and for erosion control. In the 1940's and 50's it was recommended by many fish and wildlife agencies for its wildlife values. Unfortunately, at that time scientists did not know that it would become invasive. Now we know that autumn olive crowds out important native plants that are even more useful to wildlife. It's a difficult battle, though, because autumn olive grows near the Sanctuary outside of the Forest boundary, providing a source for seed that birds continue to bring to the area.
- Periwinkle is another plant that has escaped cultivation and is found at Loda Lake. We'll talk about it near the end of the walk.
- This stop offers a good view of the lake. Take a few minutes to look and listen and see what kinds of animals you see or hear. Watch for great blue herons fishing along the lake edge and red-winged blackbirds on the cattails. You might even see a muskrat swimming in the lake. The tree nearby has a hole that looks like it could have been made by a pileated woodpecker.

7 – Post 22

- This spot is ideal for many of the spring wildflowers that are found in more mesic forest communities. Mesic refers to the amount of water available to plants. At different times of year you might find jack-in-the-pulpit, blue lobelia, wild ginger, or trillium.
- This is a place where the Forest Service and garden club members plant wildflowers that have been moved or rescued from nearby areas that are being developed. The chicken wire cages protect the newly transplanted plants from being devoured by deer and other wildlife.
- Loda Lake is a sanctuary for native wildflowers, grasses, trees and shrubs. The primary management goal for the sanctuary is to restore the plants and natural communities that grew here originally and that might have grown here. Plant rescues are one way the Forest Service is fulfilling that goal. Plant rescue operations transplant plants from areas designated for destruction to new, but similar habitat environments. These are only done after careful consideration of invasive plant issues and legal procedural requirements.

- 8 – Post 23
- The beech tree is thought to be 100 years old. You can see where the bark has been scared by people carving names into the trunk.
  - This beech is an indication that we are in a mesic forest natural community. Mesic refers to the amount of moisture in the soil available to plants. It means the amount of moisture is not very dry and not very wet, and there is moisture available to plants through most of the year. This area doesn't get more rain than the dry-mesic forest, so how can there be more moisture?
  - The soil has more organic matter, formed by the decomposition of leaves and other vegetation by microorganisms. The organic matter acts like a sponge that captures and holds water.
  - Mesic forests have some of the same plants found in dry mesic forests. Hemlock, for example, grows in both. Beech and maple trees are dominant in mesic forests. Paper birch, red oak, and white pine are also present.
- 9 – Post 28
- The pine plantation was planted by the Civilian Conservation Corps when the Forest Service took possession of the property in the late 1930's.
  - Soil erosion was a big problem after the timber was cut and after farming. The Forest Service operated a large tree nursery in Michigan at which it grew seedlings for reforesting the state. Red pines were planted to stabilize soils because they are adaptable to a variety of soil types and are easy to grow.
  - Notice the plants that are coming in under the pines. The plantation occurs on some of the richer soils and we're now beginning to see the natural community coming back. Maple, beech and ash trees that would normally occupy the site have come in under the pines.
- 10 – 32
- From 1909 to 1916, the area was farmed by Thomas Hunt, and these foundations are what remain of the farm. Besides the foundations, there are few signs that this was once a prosperous farm with a four-room house; a large sheep barn; a modern hip-roof barn with 12' x 12' timber framing; a milk house; an ice house; a bunk-house for farm hands; a windmill and water tank; and a chicken house.
  - Apple trees are a remnant of the apple and peach orchards that once grew here. There is no sign of the crops of navy beans, corn, millet and alfalfa, and oats Hunt grew.

- Even if there were no building foundations left, a few plants would let us know there was a home here at one time. Over by the house foundation you'll find a lilac bush and yucca. As people settle in new areas, they often bring with them plants from their previous homes, or add plants that remind them of home. The Ditlow family was the last to work the farm before the Forest Service bought the property, and they planted the yucca. At that time, planting yucca at family homes and gravesites was a tradition in the Ditlow family.
- At another stop we talked about invasive exotic plants. Not all introduced plants become invasive, in fact most do not. Yucca is an example of one that doesn't. You can probably think of others.

11 – New bench between posts 34 and 35

- This area is yet another natural community that contributes to the diversity of wildflowers at the sanctuary. The Forest Service is managing this site as a savanna.
- The best way to describe a savanna is to think of a park with widely spaced trees and lots of grass. Another way to think of it is as a prairie with trees. The understory is filled with native warm season grasses (grasses that grow actively in summer), and wildflowers. They are a haven for nectar-loving insects, as well as songbirds that feast on both insects and seeds. Scientists describe several types of savannas in Michigan; oak barrens, oak-pine barrens, and pine barrens are all types of savanna.
- Historically, this area might well have supported pockets of oak-pine barrens, which are found on well-drained, sandy glacial outwash. One way to tell how open an area was is to look at the growth of some of the older, larger trees. Trees that grow in a forest are crowded by other trees growing nearby. As a result, the branches occur higher up on the tree and angle upward. If you stood under a forest-grown tree in a rainstorm you would probably get wet. The branches of trees that grew in an open area are much closer to the ground and have a wide spread, more like the shade trees in yards and along streets. You'd stay much drier standing under an open grown tree.
- Savannas evolved with the fire that was a regular, natural part of the landscape. Before European settlers arrived, fire was an important process in maintaining prairies, savannas, and barrens. Periodic fires killed trees and shrubs that invade open spaces and shade out plants beneath. These fires allowed ground forbs like wild lupine, butterfly weed and coreopsis to grow. Some fires occurred because of lightning, while other fires were intentionally set by Native Americans to maintain savannas and prairies.

- The Forest Service is introducing fire back into this natural community by conducting prescribed burns.
- They are also restoring savanna plants to this part of the area, planting savanna grasses and wildflowers such as June grass, prairie smoke, milkweed and wild lupine. This is a great example of what you can do in your own garden to attract butterflies and other nectar-loving insects and birds.
- True savannas are rare today, and so are a few of the plants and animals that occupy savanna habitats. One of these is the federally endangered Karner blue butterfly.
- While not found at Loda Lake, the federally endangered Karner blue butterfly has been found nearby. The Forest Service manages for one population just north of Highway 20, south of Loda Lake, and the butterflies have also been seen north of the area.
- Karner blues are small butterflies about the size of a nickel. They lay their eggs only on or near lupine plants and the caterpillars eat only lupines, which grow in savannas.
- This is also a good place to talk about pollinators. Pollinators are critical to the health and propagation of wildflowers. Most flowers need insects to move pollen from one plant to another in order to produce viable seeds. While not native to North America, honey bees have become important pollinators of many species, including most agricultural crops. Many kinds of native bees, as well as butterflies, flies and even birds are also important pollinators. The Forest Service takes into account the need for pollinators in their management of the national forests. Here they have planted four different species of milkweed to attract Monarch butterflies as well as other wildflowers for honey bees and other insects.

12 – Post  
37

- The presence of this paper birch tells us something about how the natural communities here have changed over time. It established thickly in many areas following the widespread clearcutting and slash burning that happened in the late 1800's and early 1900's.
- One clue that paper birch was very common here is the fact that the local school was called Birch Grove School.
- Few birch remain, because many of these birch stands are now nearing the end of their natural life span and the trees are dying and falling to the ground.

- At Post 21 we talked about invasive exotic species. Another of those is periwinkle, which grows in a few places between posts 35 and 39. Periwinkle, a low-growing vine, was introduced to the U.S. from Europe many decades ago to use as an ornamental groundcover. It has escaped cultivation and is invading natural areas in at least 36 states, including Michigan. The qualities that made it attractive to gardeners as a groundcover are the very characteristics that make it invasive: it grows vigorously, forms a dense groundcover, and spreads rapidly. Because it forms dense mats, it crowds out native wildflowers and other native plants.
- Before it was known to become invasive, periwinkle was planted in several places at Loda Lake after the property became a wildflower sanctuary. The Forest Service has been actively working to remove it from the area. At one time periwinkle completely covered the ground between posts 1 and 2. Control efforts have removed most of those plants.

13 – Picnic area

- Conclude talk. Summarize the main points:
  - This area is home to so many different kinds of wildflowers and other native plants because of the diversity of natural communities.
  - We saw examples of dry-mesic and mesic forest, bog, emergent marsh, shrub thicket, and savanna natural communities.
  - Loda Lake Wildflower Sanctuary was created as a partnership between the Forest Service and the Garden Clubs of Michigan in 1950. That partnership continues today.
- Encourage visitors to return to Loda Lake Wildflower Sanctuary to walk the trails at different times of year. Each season they will see different wildflowers in bloom.