

BOTANY SCAVENGER HUNT

TARGET AUDIENCE:
Ages 10 – adult, families

SUGGESTED TIME:
(preparation time
not included)
60 – 90 minutes

**ESSAY FROM
A SAND COUNTY
ALMANAC:**

“Prairie Birthday”
p. 44 – 50

KEY QUOTE:

“What a thousand acres
of Silphiums looked like
when they tickled the
bellies of the buffalo is a
question never again to
be answered, and per-
haps not even asked.”
—Aldo Leopold, p. 45

**PROJECT
CONNECTIONS:**

WET

- Thirsty Plants
- Stream Sense

**WONDERS OF
WETLANDS**

- Wetland Weirdos
- Wetland Wheel
- Marsh Market
- Life in the Fast Lane

WILD

- Drawing on Nature
- Learn to Look, Look-
ing to See
- Saturday Morning
Wildlife Watching

WILD AQUATIC

- Aquatic Roots
- Water Plant Art

PLT

- The Shape of Things
- The Fallen Log
- Are Vacant Lots
Vacant



Cheryl Riley

THEME: Native plants have adaptations that make them suitable for their respective environments.

OVERVIEW & OBJECTIVES:

In his essay “Prairie Birthday,” Leopold discusses that most people do not pay attention to the blooming times of plants (their “prairie birthdays”). In this activity, participants will discover unique characteristics and adaptations of plants in their local area. Leopold tells the story of his favorite prairie plant, the compass plant. After completing this scavenger hunt, participants will be able to tell a story about the plants they encounter.

BACKGROUND:

Leopold liked to observe plants flowering around the Wisconsin countryside where he lived. He noted the time of year each plant would

bloom, and called the blooming time its “prairie birthday.” Even in Leopold’s time, native prairie ecosystems were on the decline due to mowing, grazing and plowing. He and his family conducted one of the first prairie restoration projects in the country on their Wisconsin farm. Since Leopold’s time, scientists have learned a lot about how to manage prairies to protect native species and restore land to a healthy state.

In his essay, Leopold describes his discovery of a small patch of compass plant, or *Silphium laciniatum*, which had escaped mowing in a country cemetery. *S. laciniatum* is a native prairie plant that sends up yellow blooms each July. Leopold took pleasure in seeing it grow year after year, and

INSTRUCTOR'S NOTE:

Although this activity and background information were developed for the prairie ecosystem, it can be adapted to any ecosystem.



U.S. Fish & Wildlife

celebrated its “prairie birthday.” He regretted that most people never got to know the *S. lacinatedum* and therefore never missed it when it vanished. *S. lacinatedum*, commonly called compass plant, is a prairie species that grows in rocky, sandy prairies. A prairie glade with thin soils and rocky outcrops would be a typical habitat to find compass plant. This plant is in the Aster family, *Asteraceae*, and looks like a sunflower on tall stems. The common name results from the leaves turning at an angle, appearing to “point” to the North. It is resilient to most environmental and human impacts, but will lose the battle to constant mowing, grazing or plowing.

Old country cemeteries and railroad rights-of-way remain excellent remnants of prairies because the management of these areas favors prairie species. Fire, rather than mowing, was used in country cemeteries to “clean up” the vegetation around the plots. The prairie species were able to survive these periodic fires. Accidental fires along railroads also encouraged prairie species. Neither of these practices is as common today. Changes in soil, water availability or chemical parameters, whether natural or human influenced, may favor non-native species. In “disturbed” areas (like roadsides, vacant lots or agricultural fields), plants may be inadvertently introduced from Europe, Asia or other parts of the U.S. These **non-native** plants do not typically have natural controls, like disease or predators,

and may become **invasive**. Many of these plants are considered “weeds.” In our global world today, it is difficult to determine whether a plant is native or non-native. Plants may be classified into several categories. Native plants are those plants that are adapted to the climate and soils of a particular area and have survived in these conditions for possibly thousands of years. Many of these plants have limited tolerance for change.

Prairie ecosystems are complex, diverse systems that are subjected to ever-changing, sometimes harsh conditions. Prairie plants evolved in the presence of conditions of extremes such as hot summer temperatures, strong winds and periodic drought. These conditions create severe stress for plants. Prairie fires and large grazing animals such as bison also affected the growth and survival of plants in the prairie. Plants of the prairie ecosystem must be adapted to all of the factors that affect their survival through the changing seasons. The competition for space, nutrients and water are limiting factors for plants in the prairie ecosystem. Extensive root systems, sometimes two to three times the length of the aboveground plant, enable the prairie plant to reach water trapped in soil layers deep below the surface. In times of drought, the prairie plant will be able to access moisture unavailable to other plants.

Blooming and seed production require high demands for water and nutrients. Specific species of prairie plants are adapted to bloom and pro-

duce seeds at different times in the growing season. Some are early season bloomers like dog-tooth violets and wild indigo. Others require a longer growth period before blooming, and are timed to bloom mid-summer like Black-eyed Susans and butterfly milkweed. Late-blooming prairie plants may need less moisture to produce blooms and be able to bloom during the hot and dry late months of summer.

To be able to bloom and produce seed successfully when moisture may be limited, prairie plants have short or graduated blooming periods. In a short blooming period, the plant maximizes its blooming potential by a strong display of color, pattern and scent to attract pollinating insects quickly. The seed then matures quickly, before drought can compromise its development. For plants that have developed a graduated blooming strategy, the plant produces flowers that bloom a few at a time over a period of time. Compass plant (*S. lacinatedum*), gayfeather and the mulleins are all examples of this approach. Graduated flowering allows the plant to produce flowers over a wider period of time. Some flowers may be stressed by a period of drought and not produce mature seed. If moisture becomes available the plant can still respond by producing new flowers that successfully mature.

Human activities such as irrigation can affect the availability of moisture to plants from the water table. A depleted water table can create artificial conditions of drought even when annual moisture levels are not abnormally low. During periods of severe drought, prairie plants will avoid the stress of blooming altogether. They will survive the growing season by reducing growth and storing nutrients in their root systems. Many species of perennial prairie plants can live for very long periods of time. Skipping the blooming stage for a single growing season when moisture is limited is an adaptation to survival.

Throughout Leopold's writing, he encourages us to notice what's happening in our environment and care for the plants and animals that share our space. On this scavenger hunt, participants will discover several unique qualities of plants in their ecosystem.

PACKING LIST:

- *A Sand County ALMANAC*
- Copies of BOTANY SCAVENGER HUNT GUIDE SHEET (5 per small group)
- Answer key for guide sheet (as appropriate)
- Clipboards and pencils (1 – 2 per small group)
- Crayons (1 set per small group)
- Field guides to local plants (1 per small group, see Appendix for suggested field guides)
- 20 numbered flags or numbered wooden stakes with ribbon

Optional Materials:

- Small backpack or zip-lock for group materials
- Plant terms sheet, root diagrams, plant keys for local plants (or you can bookmark in field guides)
- Prizes for those groups who complete the hunt
- PowerPoint presentation or laminated photographs showing examples of local plants
- Compass plant root visual aid (sunflower plant taped to a 30-foot long rope that is frayed at the bottom to show the extensive root system of a prairie plant)

PREPARATION:

- Read the essay "A Prairie Birthday" (p. 44 – 50 in *A Sand County ALMANAC*).
- Scout a local outdoor area and flag or stake the plant stations you want your group to visit. (20 is a nice number for the hunt — you may have less.) Make sure all stations are numbered. Create a set of numbered cards the groups will choose from before they go out and explore the prairie. Each group will record information on 3 – 5 plants, but should visit all to see what they look like and try to guess the names.
- Make a key with the answers to all plant stations in the scavenger hunt. *Note:* There may be more than one common name for a given plant.
- Make copies of (or bookmark in field guides) plant term definitions, root diagrams and keys for local plants. Be sure flagged plants are in the guides you are using.
- Print and organize procedure cards to fit your timeframe, audience and facilitation needs.

Optional:

- Create a visual aid to demonstrate the roots of a compass plant by attaching 30 feet of rope to a fake sunflower plant. Mark on the rope the area that would be the stalk/stem of the plant. Fray the ends to represent roots. If you can, hang the plant from the ceiling to symbolize how extensive the roots of prairie plants are.
- Gather photographs or develop a PowerPoint presentation showing examples of local plants.



BOTANY SCAVENGER HUNT

ORIENTATION CARD



Introduce participants to your ecosystem. For example, the prairie is an ecosystem dominated by non-woody plants, both grasses and forbs, and adapted to conditions of intense light, extremes of temperature, wind and moisture. Prairie plants must be adapted to survive a variety of stressful conditions. Some prairie plants survive by growing deep root systems to access water, others by adjusting their blooming periods to make use of available moisture.

- Show plant PowerPoint or share photographs of local plants.
- Discuss the components of a healthy ecosystem.
- Using plant keys for local plants in field guides (and/or additional plant terms sheets), introduce common terms used to describe a plant's leaves and flowers.
- *Optional:* Show visual aid of compass plant (rope hanging with flower head) to illustrate how extensive the root systems of prairie plants can be.



BOTANY SCAVENGER HUNT

BOTANY SCAVENGER HUNT CARD



Take participants to the outdoor area you have scouted and flagged. The goal of this scavenger hunt is for the participants to observe unique characteristics about local plants and to be able to identify the species based on these observations, as well as discovering common characteristics of specific floral families (i.e. this stem looks like it belongs in the mint family).

- Divide participants into groups.
- Distribute to each group: one clipboard, 3 – 5 BOTANY SCAVENGER HUNT GUIDE SHEETS and a pencil.
- Give each group 3 – 5 numbers corresponding to your plant stations. The numbers will match the 3 – 5 plant stations they are to investigate. They will fill out one guide sheet per plant station. (For example, you have set up 20 plant stations. Group one is assigned plant station numbers 3, 6, 9, 12, 16.)

(over)

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- Let the group know that the plant stations have been flagged and numbered. They should find the plants and complete guide sheets as best they can for their designated five plants first. As time allows, encourage groups to visit additional plant stations to see if they can identify the plant at that station based on previous knowledge or using field guides (a prize may be given at the end of the hunt for the group who correctly identifies the most plants).
 - Give the groups a set amount of time to complete the hunt, and turn them loose to explore.



BOTANY SCAVENGER HUNT

WRAP-UP CARD



Bring the groups back together.

- Allow groups time to compare their answers to the instructor's answer key.
- Have a participant from each group share one discovery or experience they had in their time in the field.



BOTANY SCAVENGER HUNT

WHAT PART DO I PLAY? CARD



Read aloud the passage below:

“What a thousand acres of *Silphiums* looked like when they tickled the bellies of the buffalo is a question never again to be answered, and perhaps not even asked ... Why does *Silphium* disappear from grazed areas? I once saw a farmer turn his cows into a virgin prairie meadow previously used only sporadically for mowing wild hay. The cows cropped the *Silphium* to the ground before any other plant was visibly eaten at all. One can imagine that the buffalo once had the same preference for *Silphium*, but he brooked no fences to confine his nibblings all summer long to one meadow. In short, the buffalo's pasturing was discontinuous, and therefore tolerable to *Silphium*. It is a kind providence that has withheld a sense of history from the thousands of species of plants and animals that have exterminated each other to build the present world. The same kind providence now withholds it from us. Few grieved when the last buffalo left Wisconsin, and few will grieve when the last *Silphium* follows him to the lush prairies of never-never land.”

– Aldo Leopold, *A Sand County ALMANAC*, p. 45 – 50

(over)

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- What is Leopold trying to say in this essay?
 - Did you see any plants today that you had not noticed before? Are any of these plants threatened or endangered?
 - What do you think this landscape looked like 200 years ago? What will it look like 200 years from now?

BOTANY SCAVENGER HUNT GUIDE SHEET

Record your findings on this sheet.

Names of members in group:

Date:

Location:

PLANT FLAG #:

PLANT NAME:

(name your plant)

LEAVES: List 5 details about the leaf of your plant:

(toothed, lobed, alternate, opposite, hairy, palmate, whorled, basal, size...)

- 1.
- 2.
- 3.
- 4.
- 5.

FLOWERS: List 5 details about your plant:

(color, shape, petals, stamens, sepals, pistil, umbel, disk, rays...)

- 1.
- 2.
- 3.
- 4.
- 5.

ADAPTATIONS:

How might this plant cope with extreme weather (hot sun, wind, cold and drought)?

How is this plant pollinated?

Do you see evidence that anything eats this plant?

Does this plant have competition for water, nutrients, sunlight and space?

HABITAT:

Describe where this plant is growing.

Record 3 details about its environment and soil:

What is growing nearby?

Is it growing in a disturbed area?

What do you think the elevation is? (How can you find the answer later?)

SAMPLE:

Do a crayon rubbing, sketch or take a photo of your plant (but please don't pick it).

DISCOVERY:

What new or interesting observation did you make about this plant?

HISTORICAL TRIVIA:

Is this plant native? Does anything about it make you think it might have been used for something else (medicine, dye, food)?

HUMAN/WILDLIFE IMPACT:

How is this area used by humans? By wildlife?

Can you find any evidence of human activities that impact this plant?